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Special Issue

on

RESEARCH AND EXCELLENCE FOR TRANSFORMATIVE HIGHER EDUCATION

on the occasion of

AIU SOUTH ZONE VICE CHANCELLORS' MEET–2022-23

hosted by

ANDHRA UNIVERSITY, VISAKHAPATNAM

on

January 31- February 01, 2023

#Let's Create AtmanirbharBharat Together

The South Indian Association's
The S.I.A. College of Higher Education
P-88, MIDC Residential Area, Dombivli Gymkhana Road
Near Balaji Mandir, Dombivli (East), Pin-421 203

Minority College

APPLCATIONS ARE INVITED FOR THE FOLLOWING POSTS

FROM THE ACADEMIC YEAR 2022-23

UN-AIDED

Sr. No.	Cadre	Subject	Total No. of Posts	Category
1	**Principal**	--	01	01 - OPEN
2	**Assistant Professor**	Economics	01	01 - OPEN
3	**Assistant Professor**	Commerce	02	02 - OPEN
4	**Assistant Professor**	B.Com. (Accounting & Finance)	03	03 - OPEN
5	**Assistant Professor**	Bachelor of Management Studies (B.M.S.)	02	02 - OPEN
6	**Assistant Professor**	Information Technology	09	09 - OPEN

The above posts are open to all, however, candidates from any category can apply for the post. Reservation for women will be as per **University Circular No. BCC/16/74/1998 dated 10th March, 1998. 4% reservation shall be for the persons with disability as per University Circular No. Special Cell/ICC/2019-20/05 dated 5th July, 2019.**

Candidates having knowledge of Marathi will be preferred.

"Qualification, pay scales and other requirements are as prescribed by the UGC Notification dated 18th July, 2018, Government of Maharashtra Resolution No. Misc- 2018/C.R.56/18/UNI-1 dated 8th March, 2019 and University Circular No. TAAS/(CT)/ICD/2018-19/1241 dated 26th March, 2019 and revised from time to time"

The Government Resolution & Circular are available on the website : mu.ac.in.

Applicants who are already employed must send their application through proper channel. Applicants are required to account for breaks, if any, in their academic career.

Application with full details should reach the SECRETARY, The South Indian Association's **The S.I.A. College of Higher Education, MIDC P-88, Residential Area, Dombivli Gymkhana Road, Near Balaji Mandir, Dombivli (East), Pin – 421 203 within 15 days** from the date of publication of this advertisement. **This is University approved advertisement.**

Sd/-
SECRETARY

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Opinions expressed in the articles are those of the contributors and do not necessarily reflect the views and policies of the Association

Conceptualising the South Zone Vice Chancellors' Meet on Research and Excellence for Transformative Higher Education

Pankaj Mittal* and Sistla Rama Devi Pani**

Research is an important dimension of Higher Education; therefore, Higher Education Institutions have the responsibility to undertake Research in the areas pertaining to various dimensions which can enable them to carry forward. The Research Outcomes provide us with means and methods of resolving problems and dilemmas. There are several niche areas in which we can take up research studies. We can create a research agenda to address important topics like the impact of higher education on economic growth, inequality, students' views and attitudes, graduate employment, diversification, management, evaluation, internationalisation, regulation/government, institutional analysis, governance, management, quality, assessment, funding and economic issues, etc. Research studies can also be taken up on the protection and preservation of the natural resources, forests, wildlife, flora and fauna, soil and water productivity, organic farming system, climate change, genetic resources, crop and livestock improvement and management, post-harvest management and value-improvement, human resource development, agricultural economics, technology assessment, refinement and transfer, research for trivial and hill regions, etc. Thus, the apt answers to many fundamental queries can be extracted through Research.

One of the important functions of a university is the production or generation of knowledge through Research to advance the understanding of the natural and social worlds and enrich the accumulated scientific and cultural heritage of the human world. This is what makes an institution of Higher Education a university. Research is a creative work undertaken in a systematic way to increase knowledge and to use the stock of knowledge to devise new applications. It is a most important tool for advancing knowledge, promoting progress, and enabling man to relate more effectively to the environment, accomplish purposes, and resolve conflicts. In this rapidly changing phase of the 21st century, it is important for universities to be able to manage the flow of knowledge toward achieving creative goals. Research is indispensable for the university to remain alive and relevant.

In the era of global competition for world rankings, accreditation, and the ever-growing influence of technology, the higher education sector is increasingly becoming important in India's growth trajectory. The current university structure of India with prominence on teaching was developed in the British era to fulfill the needs of that time. Now, the dimension of Research is also gaining significance in Indian universities to keep pace with and compete with international universities. It is also important for the progress of the nation. As a matter of fact, National development is the result of two simultaneous processes — growth and change, and both can be influenced by universities. Universities can play the lead role in the efforts for development by placing the needs of the development process at the center of their research and teaching activities. Research can be concentrated on problems related to the reality of the country and the needs of the development process.

The Ministry of Education, Government of India undertook some significant initiatives to strengthen the research component. The IMPRESS Scheme (Impactful Policy Research in Social Sciences) was initiated to identify and fund research proposals in Social Sciences with an impact on governance and society. The SERB-STAR Scheme (Science and Engineering Research Board's Science and Technology Award) was initiated to support basic research in frontier areas of science and engineering. The STRIDE (Scheme for Trans-Disciplinary Research for India's Developing Economy) is to build multi-sectoral linkages between Universities, Government, Community, and Industry for national

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development. The SPARC (Scheme for Promotion of Academic Research Collaboration) was initiated to promote joint research projects between Indian institutions and the best of the global universities from 25 select countries. It provides funds for visits and long-term stays of international faculty and researchers in Indian institutions and gives funds for training Indian students in premier international laboratories. The LEAP (Leadership for Academicians Excellence Programme) aims to equip senior faculty members to take up leadership roles in the future at various levels in higher educational institutions.

Excellence can be realised in universities only when the quality of education is improved to the extent that it helps in development. All possible ways and means should be explored and implemented to raise the standard and quality of teaching and research. Improving the standard and quality of teaching, research and extension should be given the utmost care and attention to usher excellence in all domains of education. Excellence in teaching and research in any university depends on the quality of students and on the quality of their faculties. Among 1050 universities in India, scarcely 20 to 30 universities are considered to have faculty of high standing. An estimated 40% of college teachers work on a non-permanent, *ad-hoc* basis and are designated variously as temporary, contractual, *ad hoc*, and guest faculty. So, mediocrity is more in the system than excellence.

As far as Research is concerned, the reputation of Indian universities is nowhere near the world-class universities of other countries. Only 75 universities are featured in THE world university rankings but none of them could reach the top 200 ranks; one IIT reached the 300th rank and 6 universities were in the ranks between 351 to 400. Though there are several arguments for Indian universities not finding a place in the top 200 universities, one point of consensus is the poor research output of Indian universities. This is because of several reasons like lack of adequate funding, insufficient infrastructure, lack of quality faculties; intake of poor-quality students in higher education, insufficient support from the government, and inadequate collaboration between academia and industries for undertaking need-based research, etc.

The National Education Policy (NEP)- 2020 report also made enough emphasis on research. The first noteworthy point is that the NEP provides for a research ecosystem under the stewardship of the National Research Fund (NRF). It aims at providing the required impetus to grow the R&D agenda by way of building a research ecosystem comprising the government, universities, research institutes, and industry. According to the NEP, the NRF will work towards seeding, funding, coordinating, and monitoring research and innovation initiatives. It will also encourage research through merit-based peer evaluation of research projects along with incentives like awards for outstanding work. Teaching, on the other hand, is not only advantageous for the student, but for the teacher as well, who meets new and fresh views, ideas, and perspectives gained through research. Therefore, quality research cannot exist away from teaching.

The National Education Policy (NEP) 2020 report also laid much emphasis on research. The first noteworthy point is that the NEP provides for a research ecosystem under the leadership of the National Research Fund (NRF). It aims at providing the required impetus to grow the R&D agenda by way of building a research ecosystem comprising the government, universities, research institutes, and industry. According to the NEP, "the NRF will work towards seeding, funding, coordinating, and monitoring research and innovation initiatives." It will also encourage research through merit-based peer evaluation of research projects along with incentives like awards for outstanding work.

Indian Higher Education is going through the most interesting revolutions in the centuries, and that too at a very rapid pace. These revolutions are being reinvigorated and accelerated through both natural and manmade happenings. The most important happenings among others are the launch of the National Education Policy–2020 and the global Pandemic COVID-19. The National Education Policy geared the academia of the country to build an education system rooted in Indian ethos taking the best from global education practices which contribute directly to transforming India by providing high-quality education to all. Simultaneously, COVID-19 compelled us to undergo massive disruptions and shifts in education processes and practices. The need of the hour is to adopt Transformative Education. Transformative Higher Education *can be construed as higher education that empowers learners to*

be reflective and critical thinkers and committed tech-savvy individuals who are able to contribute meaningfully to the local and global communities. Transformative education equips learners with the core knowledge, values, attitudes, and skills needed to address pressing local and global challenges in addition to preparing them to contribute to a more just, inclusive, diverse, equitable, secure, and sustainable future for all.

The Association of Indian Universities (AIU), one of the premier higher education institutions in India, was established in 1925. It plays a vital role in shaping Indian higher education by being a research-based policy advice institution to the Government of India in the field of Higher Education, Sports, and Culture. One of the key activities of the AIU is to convene the Vice Chancellors' Meets at the Zonal and National levels to discuss various issues related to higher education. India is a country with a large geographical area, for ease of reaching out, AIU has grouped the member HEIs into 5 zones—East, West, North, South, and Central. Each zone is constituted of HEIs located in 5-6 States grouped in that Zone. Thus, 5 Zonal Meets and one National Vice Chancellors' Meet are organized annually. These Meets are important platforms not only to discuss the significant issues of higher education but also to play a catalytic role in finding solutions for different problems of higher education through collective wisdom. Further, AIU carries forward the voice of the participating leaders of higher education to appropriate agencies and authorities for their dispensation. Every year in the Annual Vice Chancellors' Meet, a specific theme that is of topical significance for the higher education community is taken up for discussion. As a run-up, subthemes related to the main theme are discussed in the Zonal Vice Chancellors' Meets.

In order to guide and support the Indian HEIs in imparting state-of-the-art Transformative Higher Education to the students, AIU as a representative body of HEIs in India has set out to organize all the Zonal and National Vice Chancellors' Meets in 2022-23 on the theme*: Transformative Higher Education for Atmanirbhar Bharat.* In Zonal Vice Chancellors Meets, themes on different essential aspects of teaching-learning in the light of Transformative Higher Education will be discussed exclusively.

a. *North Zone*: Internationalization for Transformative Higher Education
b. *East Zone*: Pedagogies and Use of Technologies for Transformative Higher Education
c. *Central Zone*: Curriculum for a Holistic and Multidisciplinary Transformative Higher Education
d. *South Zone*: Research and Excellence for Transformative Higher Education
e. *West Zone*: Evaluation Reforms for Transformative Higher Education

The Present Meet

The present Meet is the South Zone Vice Chancellors' Meet. The theme for this Meet is *Research and Excellence for Transformative Higher Education.* The Session Themes are:

(a) Research Funding
(b) Promoting Quality and Relevant Research
(c) Linking Teaching and Research

The discussions in the Meet will primarily focus on the status of Research in Indian universities; address key issues involved in research funding; share relevant innovative and best practices, case studies, and lessons in research; ways to enable educational leaders, educators, policymakers, and other stakeholders to unlock and utilize the potential of research for Transformative Higher Education.

Format and Approach

The Sessions will be of 1 Hour and 30 Minutes each. In each Session, there will be experts from Government, HEIs, and ICT. Presentations will be followed by interaction and Q and A. Based on deliberations; a commitment statement will be framed for the universities to further the cause of Higher Education Research in India. In addition to academic deliberations, capacity development initiatives will be taken by forming a group of Vice Chancellors who will work on research dimensions of Transformative Higher Education.

Session Details

Technical Session-1: Research Funding

Research is an expensive activity, particularly in those subjects which involve laboratory or

fieldwork and costly equipment. Mostly, the universities are financially inadequate to fund the research in their universities. Therefore, the responsibility for the cost of conducting research falls to the student or faculty member, who in turn, approaches the funding agencies or the Government for grants to support their work. Generally, in all countries, there is a mechanism for funding research through two agencies viz, Government and corporate sector. A grant gained for undertaking scientific research, usually through a competitive process, is defined as research funds. Applying for grants and obtaining research funds is one of the important elements of performing research.

In India, the universities primarily sustain the government for research funding. The Government allocates most of the research and development funding to government laboratories and institutes of science and technology. Funding from the corporate sector for university research is almost negligible. Thus, the universities survive on minimal funds which leads to a dismal situation as far as research in Indian universities is concerned. University researchers have been raising their demands for access to resources on a par with those provided to laboratories for several years.

Listening to the clarion call of university researchers and in view of the grim state of affairs in our universities, National Education Policy-2020 made a recommendation to establish National Research Foundation (NRF). National Research Foundation (NRF) will fund, coordinate, and promote research in the country. It will assimilate the research grants being given by various Ministries and adequately supplement them with additional funds. It will ensure that the overall research ecosystem in the country is strengthened with a focus on identified thrust areas relevant to our national priorities and towards basic science without duplication of effort and expenditure. A budget provision of Rs 50,000 crore has been allocated for the NRF over a period of five years. The NRF would have 10 directorates - one each for natural sciences, mathematics, engineering, environmental and earth sciences, social sciences, arts and humanities, Indian languages and knowledge, health, agriculture, and innovation and entrepreneurship. It will enable new generations of scholars to realize their potential. But all this will be successful only if it gets the right people who can protect it from undue influence. It is also important that the universities know or learn how to make the best use of it.

In this session, there will be deliberations on stocktaking on the financial health of university research in India, ways and means of Research Funding, National and International Sources of Research Funding; National Research Foundation (NRF), how to make the best use of NRF for university research, etc.

Technical Session-2: Promoting Quality and Relevant Research

Research is best conceived as the process of arriving at dependable solutions to problems through planned and systematic collection, analysis, and interpretation of data. As per OECD, India stands in 4th position in producing the highest number of Ph.D. scholars i.e. 24,000 per year. Though the enrolment in Ph.D. programmes has increased, the quality of topics chosen, and the thesis written are constantly deteriorating. Research in the field of Science and Technology, even after investing a huge amount, is not benefitting the nation as the works in this field are not innovative enough. The theses are mostly theoretical, repetitive, and parallel studies. The topics of History, Political Science, Literature, etc., are often repetitive and distant from the contemporary world. After the topics, the thesis is far below the quality as often filled with plagiarized content. Despite having a mechanism to check the extent of plagiarism, it goes unchecked. University Research in India often lacks full transparency and reproducibility, and poor research practices are increasingly picked up by the research scholars, which is diminishing the trust in Indian academia. With the changing dynamics and approach, the dignity and respect associated with a doctorate degree have gone down. Most of the doctoral studies conducted in the universities have only shelving value. They are not suitable for the application. It is therefore essential to increase the standard and relevance of Ph.Ds in India.

Relevance has great significance in research as it helps in maintaining momentum. Research that has practical relevance adds value to the research. The finding could make a recommendation for a

particular industry or suggest ways to improve certain processes or invent a new thing.

It is high time that we promote quality and relevant research in India. In this technical session, there will be deliberations on the status of research in Indian universities; identify strategies to promote quality and relevance.

Another point that requires focused attention is the indivisibility of research and teaching. The main reason that university teachers should also be engaged in research is that this improves both research and teaching. Teaching and research enhance each other as active researchers are knowledgeable and informed teachers and teaching stimulate faculty creativity, enthusiasm and compulsive need for research. Research is gaining scholarships of discovery, integration, and application, and the teachers' role is to develop these skills in students. Unless a teacher is not a researcher himself or herself, one cannot train the students in gaining skills and scholarship in research, and the very purpose of a university to impart the highest level of knowledge and skill to students is defeated. Integrating teaching and research is also important as the universities need to respond to increasing environmental and technical complexity through the faculty who are highly qualified, flexible, and expert professionals who can relate to unanticipated circumstances in creative ways and handle unpredictable problems independently. Teaching is improved by linking with research because this is the only way for new research results to be quickly integrated into the curriculum. There is also an argument that the teacher does not exist only for the sake of the student. Both teacher and student have their justification for the common pursuit of knowledge and hence there is the unity of research and teaching. Linking teaching and research can benefit both faculty and students. There are several approaches for linking teaching and research across disciplines.

Of course, there are arguments that faculty members' preoccupation with research interferes with teaching, or that teaching limits precious time available for research. Moreover, in Indian universities, we have more than 50 per cent of contractual and temporary faculty are not engaged in research. Most of the faculty in colleges are also not engaged in research. If linking teaching and research is so useful, how will Indian HEIs realise this? These are some of the questions which need pondering.

Thus, in this session, there will be deliberations on linking teaching with research, exploring the strategies to ensure the integration of teaching and research in curricula of all the disciplines of higher education in India; with the Indian scenario where most of the faculty is not engaged in research, how the universities will exploit this teaching-research nexus.

Participation and Organization

Vice Chancellors of Indian Universities, Experts from the Government of India, Apex Bodies of Higher Education, and Academia will be speakers and Session Chairs. Experts from international organizations will also be invited to contribute. Discussions will be conducted in English. Sessions will be in a blended mode. The speakers, chairs, and participants need to inform in advance about the mode through which they would like to attend the Meet.

Conclusion

Given the significance of Research for the development of the nation as well as the planet, and also in view of the initiatives taken by the Government of India, it is in the fitness of purpose that a threadbare discussion is done on the theme. The recommendations of this Meet will continue in the National Meet of Vice Chancellors along with the recommendations of all other Zonal Meets. On the basis of these recommendations, a University Action Plan on 'Research and Excellence in Higher Education' will be prepared which will be a handy guide for Higher Education Institutions of the Country. A Policy Document on *'Research and Excellence for Transformative Higher Education'* will also be prepared and presented to the Government of India. ❑

Andhra University, Visakhapatnam : A Profile

Andhra University, Visakhapatnam is hosting the Association of Indian Universities South Zone Vice Chancellors' Meet − 2022-2023 on January 31-February 01, 2023.

Andhra University (AU) was established in the year 1926, led by three great visionaries as successive Vice-Chancellors Sir C.R. Reddy, Dr. Sarvepalli Radhakrishnan, and Dr V.S Krishna, during the formative three decades, and laid a strong foundation with their legacy of leadership, therefore attaining and sustaining the institutional excellence has become the motto which ingrained into the very culture of AU. It is located on a sprawling campus of about 500 acres full of lush green flora and fauna.

Andhra University has been striving hard to keep the brand value of being a unique seat of higher learning with multi-faceted activities in diversified disciplines. Keeping with the ethos of the contemporary academic scenario, post bifurcation of the state in 2014, the university is moving forward, exploring the scope for integration of science, technology, humanities, social sciences, population dynamics, and societal thought that could enable the university to emerge as a competitive educational hub in the country. Since good quality research has been the backbone for any university accreditation, a special emphasis is being laid to strengthen academic networking and promote national and international collaborations in cutting-edge areas of basic and applied sciences, Engineering, arts, commerce, management, law, pharmacy, and other forms of traditional arts and culture that would enhance the visibility of the university.

The University experienced a sea change in academics under the stewardship of Dr. V.S. Krishna as its Vice-Chancellor who later became Chairman of the University Grants Commission under whose stewardship, the University could march ahead keeping pace commensurate with the priorities of social inclusiveness thereby setting new benchmarks in higher education and research. Nobel laureate Sir C.V. Raman was closely associated with laying research foundations in Physics. Prof. C.R. Rao, a renowned statistician of international repute and the recipient of the Padmavibhushan award is one of the proud alumni of AU.

The University has the distinction of having five Shanti Swarup Bhatnagar Awardees, three Padmavibhushan Awardees, two Padmabhushan Awardees, three Padmashri Awardees, and a Sahitya Academy Awardee amongst its alumni who received numerous other prestigious awards. The University has 20 departments with 24 courses at the UG level, 70 departments offering 115 courses at the PG level, and Ph.D. programmes. It has 18 Research Centres and one Advanced Analytical Lab which is recognized as a national facility.

The Andhra University, which has many firsts to its credit, pioneered in introducing academic programmes such as Nuclear Physics, B.Com. (Hons), MBA, Sugar Technology later renamed into Chemical Engineering, Mineral Process Engineering, Nano Technology, Ceramic Technology, Marine Engineering, Geographical Information Systems, Retail Management, Quantitative Economics, Computer Science and Statistics, etc. In pioneered distance learning with the establishment of the Distance Education Centre under the stewardship of Prof. K.V. Sivayya in 1972. The School of Distance Education was given those days ex-post facto recognition by the Distance Education Bureau, New Delhi for all the courses. All these programmes have been well received and became popular throughout the country. The University in its journey of over nine decades continued to uphold quality standards in all perspectives. The National Assessment and Accreditation Council (NAAC) accredited the University thrice at grade 'A' and the fourth cycle is in the offing. The University was recognized by the Department of Science and Technology, Govt. of India, as one among the top fourteen Universities in India during 2018-19, in terms of contribution to research in Science, Technology, and Engineering based on the H-index developed by Scopus. This repository of knowledge has thus been shortlisted for recognition as the Centre for Potential Excellence. It was sanctioned with RUSA 2.0 grant of Rs.100 Crore under Component 4 for Quality and Excellence in

select State Universities. Career 360 magazine in its rating of various Universities and Institutions in the country awarded the 5-star category to the University based on its contribution to research. Andhra University is one of the ten Universities in India to secure this recognition. Considering merits and credits, former Prime Minister Dr. Manmohan Singh christened AU as the most 'Magnificent University', in Jan 2008 on his visit to campus.

Andhra University organized the prestigious Indian Science Congress twice, in 1976 and 2008, and former Prime Ministers Smt. Indira Gandhi and Dr. Manmohan Singh visited the campus for the inauguration of the Indian Science Congress. Former Presidents of India Dr. APJ Abdul Kalam and Shri Ram Nath Kovind visited AU twice. Former Prime Minister of India Shri Atal Bihari Vajpayee visited this seat of higher learning twice. during 1987 addressing the gathering in AU Convocational Hall and in 1998 in AU Engineering College grounds. Former Prime minister Shri P.V. Narasimha Rao also visited the AU campus. The Doyen of Indian Industry Sri Ratan N. Tata visited the campus and graced the AU Annual Alumni Meet as Chief Guest in 2018 and as a remembrance of his footprints, a huge pylon was erected on the beachfront in the premises of AU Convention Centre. Shri N. R. Narayana Murthy, Founder INFOSYS Limited visited AU as Chief Guest of the AU Annual Alumni Meet held in December 2022.

The Engineering College of the University got sanction for TEQIP Phases – I & II based on its excellent performance. The College of Engineering was adjudged the best Government Engineering College by different rating organizations. International Society for Space Research in Asia Pacific has recognized the University for Academic Standards and sponsored four M.Tech. programmes. This is the only University in India having been selected for this programme. The Department of Commerce and Management Studies was granted Rs.1.6 crores under CAS (Centre for Advanced Study) Phase-I & II, being one among only six such departments funded by the UGC at the national level. The College of Pharmaceutical Sciences was ranked in the band of 301-350 as per QS World University Rankings in April 2022.

'To Create New Frontiers of Knowledge in the transformation to a Quest for Development of a Humane and Just Society' has been the vision of AU, and hence it set its Mission 'To develop a pool of Human Expertise in Science & Technology, Engineering, Social Sciences and Humanities, the basic investment for the progress of the country'. The quality policy states 'Andhra University is committed to achieving excellence in teaching, research and consultancy'. The University offers a wide range of UG, PG, and Research Programs through seven campus colleges. They are:

- Andhra University College of Arts and Commerce
- Andhra University College of Science and Technology
- Andhra University College of Engineering
- Andhra University College of Pharmaceutical Sciences
- DR B.R Ambedkar College of Law
- Andhra University College of Engineering for Women
- Institute of Advanced Studies in Education

The University is all set to adopt the "Schools" concept. Apart from the above, the university has a School of Distance Education and an AU School of International Business (AUSIB). There are about 16,000 students pursuing higher education in campus and around 1100 students pursuing research leading to a Ph.D. degree in various disciplines. The University has experienced faculty members recognized nationally and internationally for their rich contributions to academics. All the academic departments are equipped with state-of-the-art infrastructural facilities. The highly placed alumni of the University around the globe are supportive and take part in University development programs towards collaboration and networking with various industrial and research organizations. The University entered MoUs with about 120 organizations of international repute. More than 98 percent of the faculty members are Ph.D. degree holders who speak of high teacher quality. The faculty of the University is seriously engaged in research and received major projects from both national and international funding agencies. AU has several Research Centers to carry out advanced research in various multidisciplinary areas, which include…

- Centre for Study of Social Exclusion and Inclusive Policy (CSSEIP)
- Japan Information and Study Centre

- Centre for SAARC Studies
- Centre for Population Research
- Centre for Agro-Economic Research
- Centre for Gandhian Studies
- Centre for Women Studies
- Centre for Alluri Seetharama Raju History and Tribal Studies
- Centre for Studies on Bay of Central
- Centre for Advanced Analytical Laboratory (DST-PURSE Programme)
- Centre for Delta Studies Institute
- DR BR Ambedkar Chair
- Centre for NMR Research Centre
- Centre for Defence Studies
- Centre for Environmental Studies
- Centre for Nanotechnology & Centre for Excellence (CoE)\
- IOT Centre for Excellence and
- Maritime Skill Development Centre

Industry-Sponsored Chairs

At present, AU is marching ahead towards achieving excellence in all verticals under the leadership of its Vice-Chancellor Prof. PVGD Prasad Reddy. The unique feature achieved during 2019-23 is the support from the industry to establish **18** Industry-Sponsored Chairs. AU Collaborated and has been networking with major industrial and research organizations, and entered into MoUs with reputed organizations and Universities of international repute with outcome orientation and customized deliverables. The faculties of the University are fully engaged in basic and applied research and are being deputed to different foreign universities for undergoing training and involvement in collaborative research.

Yoga and Consciousness

The Department of Yoga and Consciousness, located on 5 acres near Rama Krishna Beach, a very attractive tourist spot, is offering various courses in yoga ranging from a three-month certificate course in yoga to a 2-year M.A. program in yoga. The department is catering to the needs of students of all age groups in and around Visakhapatnam. International Students can take admission to short-term programmes and to the M.A. program also. The department offers need-based programs, especially for International Students. The department is located on the seashore with specially designed buildings and the requisite infrastructure to create a healthy and ambient atmosphere. A meditation hall of 6,700 sq.ft has been developed to facilitate students and faculty to maintain good mental and spiritual health. A Buddhist Meditation Centre is also being set up on the University's main campus in collaboration with the *Maha Bodh* Society.

Dr. V.S. Krishna Library

The library is the lifeblood of any academic institution. The University is having a monumental library - Dr. V. S. Krishna Library. It has a carpet area of 60,000 sq.ft with two buildings; one dedicated building to browsing the Library has about 5 lakh books, back volumes, and theses. Besides having e-books and journals, the Library subscribes to 450 National and International journals. All the students have access to the library for 14 hours a day. The International Students are provided with special facilities like an exclusive Browsing Centre. In addition to this library, the University has six more libraries working independently. These are (i) Engineering College Library, (ii) Law College Library, (iii) Academic Staff College Library, (iv) School of Distance Education Library, (v) Economics Library, and (vi) Commerce and Management studies Library, apart from libraries in all academic departments and research centers.

- The library provides access and use of more than 10,000 e-books ande-journals.
- Internet Access - Dr. V. S. Krishna Library also provides access to all the departments to electronic journals and databases online through UGC Infonet Electronic Journal Consortia using the Campus Network.
- NPTEL lectures and open education lectures from Stanford, Berkley, and MIT are made available on servers for any time browsing in the campus network.
- Digitalization of *thalapatras:* In this project, 58,000 *thalapatras* have been digitized during 2020-22, and the quality check for this project is completed. By Feb 2023 these digitized *thalapatras* will be hosted on Cloud.
- Digitization of theses and uploading on the Shodh Ganga platform has been taken up and so

far, around 7635 theses have been digitized. AU stands now in the top 10 list.

ICT-Enabled Campus

The campus academic departments and hostels are Wi-Fi enabled. E-Class Rooms are there with APNA BOX, GOOGLE APPS etc. The University is having MoUs with Microsoft, LinkedIn, and TCS, Infosys, to establish their centers of excellence in the campus and to provide high-end computing facilities. The University has entered MoU with APNA Box to improve teaching-learning through an ICT facility. The University also entered MoU with Google apps to have free accessibility for sophisticated Google applications for research and learning. Many of the departments are having e-class room facilities.

Health Centers

The University Health Centre and Homeopathic dispensary in the South Campus, and Engineering College Health Centre located in the North campus offer medical facilities for the students, faculty, non-teaching staff, and retired employees of the University. All students, staff, and faculty of the University are provided medicines free of cost. All students are provided with medical insurance at the time of admission which covers a wide spectrum of ailments. A new building with all requisite healthcare facilities is coming up in the south campus with 24x7 doctors' availability. The Yoga Village of Andhra University combines yoga and nature cure methods for the treatment of various disorders and also has provisions for inpatients.

Sports Infrastructure

The University has a well-accredited sports infrastructure for Indoor and Outdoor games. The sports infrastructure includes:

- Golden Jubilee Cricket Ground
- Silver Jubilee Ground
- Tennis Complex
- Indoor Gymnasium
- Physical Fitness Centers
- A.U. Engineering College Campus Cricket Ground with Bowling Machine

The University made a mark at the National level for cricket, basketball, volleyball, football, hockey, table tennis, bodybuilding, boxing, and shuttle badminton in both boys' and girls' categories. AU is the first Indian University to have a bowling machine in its armory.

American Corner

American Embassy established an American Corner in the premises of Andhra University in Visakhapatnam, which has the third stand-alone cultural outreach center in India. It was established with state-of-the-art facilities to host discussion groups, seminars, digital video conferencing (DVCs), poster exhibits, and meetings with U.S. and local specialists on a wide range of American-focused topics. Through the Corner, young researchers will have access to several American journals and magazines. Also, they will have access to engage with their counterparts not just in the United States but also across the world. The Corner is aimed at organizing virtual programs that would help youth, researchers, entrepreneurs, scientists, and policymakers to engage with their counterparts across the world. It also facilitates visitors with American-themed books, videos, and educational materials along with internet access. This can be certainly the first place to visit for accurate and up-to-date information about political, economic, cultural, and educational trends in the U.S.

International Students

Andhra University is the most sought-after University for many foreign and NRI students and their number is registering a quantum jump every year. At present there are more than 1000 foreign students on rolls representing 50 countries as follows:

International students hailing from the above countries pursue their education ranging from U.G. to Ph.D. programmes. Many prominent personalities from different countries have graduated from Andhra University.

Alumni

The highly placed alumni of the University around the globe are supportive and take part in the University development programmes with a proactive approach. AU alumni office has been set up on the campus with state-of-the-art facilities including a smart seminar hall and a multi-purpose hall with the funding of one of its illustrious alumni Dr. G.M. Rao, Chairman of GMR Group. The AU Alumni

International Students

1.	Ethiopia	14.	Togo	27.	Botswana	40.	Zimbabwe
2.	Afghanistan	15.	Kenya	28.	Bhutan	41.	Turkmenistan
3.	Iraq	16.	Zambia	29.	Iran	42.	Cameroon
4.	Burkina Faso	17.	Tanzania	30.	Ghana	43.	Rwanda
5.	Tajikistan	18.	Angola	31.	Malawi	44.	Sri Lanka
6.	Swaziland	19.	Chad	32.	Bangladesh	45.	Yemen
7.	Madagascar	20.	Namibia	33.	Lesotho	46.	Niger
8.	Sudan	21.	Côte d'Ivoire	34.	Nepal	47.	Egypt
9.	Gambia	22.	Palestine	35.	Sierra Leone	48.	Mongolia
10.	Mozambique	23.	Jordan	36.	South Africa	49.	Comoros
11.	Somalia	24.	Mauritius	37.	Vietnam	50.	Cambodia
12.	Nigeria	25.	Uganda	38.	Mali		
13.	Syria	26.	Djibouti	39.	South Sudan		

Association conducts a grand Annual Alumni Meet every December creating a platform for its alumni spread over globally, for effective interaction.

Andhra University produced umpteen number of eminent personalities who occupy coveted positions in India and abroad. The AU Alumni are able to make a mark in different walks of life including civil servants, CEOs, Industrialists, scientists, researchers, academicians, politicians, Judges, academic administrators, social workers, poets, novelists, artists, sports persons, adventurists, defense personnel, economists, bankers, software experts and so on. Andhra University Alumni Association (AAA), established in 2005, strives for AU-Alumni connect with a broad aim of strengthening AU across different dimensions – developing alumni database and campus infrastructure, Technology transfer, promoting R&D activity, enhancement of skill-set and knowledge base thereby employability of its students, by acting as a bridge between AU and its alumni. Renowned industrialist, Dr. G.M. Rao, Chairman, GMR Group, is the Founder Chairman of AAA. Some of the illustrious alumni of AU and prominent personalities who rendered their invaluable services to the University include….

- Bharat Ratna C V Raman, Nobel Laureate (Physics)
- Padmavibhushan Prof. C.R Rao, a renowned Mathematician, and Statistician of international repute
- Padmavibhushan Prof. Hiren Mukerjee (History & Law)
- Padmabhushan Dr. T.R. Seshadri, Fellow of the Royal Society, UK (Chemistry)
- Dr. Suri Bhagavantham, former Director, Indian Institute of Science, Bangalore and Former Director, DRDO. (Physics)
- Prof. Meenakshi Sundaram (Mathematics),
- Prof. Ommi Ramaswami (Mathematics),
- Prof. Humayan Kabir, Noted educationist and Co-drafter of the UNESCO 1950 statement 'the race question'
- Padmavibhushan Dr. V.K.R.V. Rao, noted Economist.
- Shri M. Venkaiah Naidu, Former Vice-President of India (Law)
- Shri G.M.C. Balayogi, former Speaker, Lok Sabha (Law)
- Dr. Grandhi Mallikarjuna Rao (Chairman, GMR Group)
- Justice Jasti Chelameshwar, former Judge, Supreme Court (Law)
- Dr. K. Hari Babu, Governor, Mizoram (ECE)
- Dr. Duvvuri Subba Rao, former Governor, Reserve Bank of India (Economics)
- Padmabhushan Prof. Y. Lakshmi Prasad (Hindi)
- Shri Purna Saggurti, Chairman, Global Corporate & Investment Banking, Bank of America, Merrill Lynch, USA
- Prof. Neeli Bendapudi, President, Penn State University, USA (Management)
- Dr. Aswani K Volety, Chancellor, University of North Carolina, Wilmington, USA (Marine Biology)

- Prof. Hayagreeva Rao, Atholl McBean Professor at Stanford Graduate School of Business, USA
- Dr. K. Ramakrishnan, former Chairman, Andhra Bank and President, Indian Banks Association, (Management)
- Smt. Padmaja Chunduri, MD & CEO, National Securities Depository Ltd (NSDL), [Commerce]
- Smt. Mini Ipe, Managing Director, LIC of India Ltd. (Commerce)
- Shri T. Seshagiri Rao, CMD, Sentini Group, (Management)
- Sri N. V. Chowdary, CMD, Natco Pharma
- Sri J. Venkateswarlu, CMD, Suven Pharma
- Sri Raman Bhai Patel, MD, Cadila Pharma
- Dr. Negere Lencho, Minister for Communication Affairs, Federal Democratic Republic of Ethiopia, Ethiopia
- Dr. Tilaye Gete Ambaye, Permanent Delegate of Ethiopia at UNESCO, Paris.
- Dr. Samuel Kifle, Director General of Higher Education, Federal Democratic Republic of Ethiopia, Ethiopia
- Dr. Ergogie Tesfaye, Minister of Women and Social Affairs, Federal Democratic Republic of Ethiopia, Ethiopia

Entrepreneurship and Skill Development

Andhra University is committed to improving the employability and entrepreneurial potential of students in tune with the thrust areas identified by the Governments. AU intends to catalyze startup culture and build a strong and inclusive ecosystem for innovation and entrepreneurship in India. As part of the RUSA initiative and policy of the Government, Andhra University established Entrepreneurship and Skill Development Centre and collaborations with Software Technology Parks of India, NASSCOM, etc. '$\bar{a}\bar{a}$ hub' Incubation Centre is located in the University Campus housing 56 start-ups as of now. It is the first of its kind among State Universities in India. Andhra University is also establishing a Food and Drug Testing Laboratory in collaboration with Visakha Pharma City to cater to the research and analytical needs of the pharma industry as well as to help the entrepreneurs involved in the export of marine products to different countries. This will be also a center for training students on skills required for the pharma industry, wherein students receive first-hand training on the use of sophisticated analytical equipment and regulatory processes to be followed in the pharma industry. There are many industries in the Coastal Districts of Andhra Pradesh involved in the business of fish and prawn culture and processing meant for exports. Avanti Feeds started a Skill Development Centre in the Department of Marine Living Resources and imparting training to the rural youth of Coastal Districts in fish and prawn culture and their processing and also providing technical support for enthusiastic entrepreneurs.

Au Incubation Ecosystem (Ā Hub)

Andhra University has established 'ā hub' (a section 8 company) with a vision to be a vibrant and sustainable India's largest integrated multi-disciplinary Incubation & Innovation Ecosystem of 2.0 Lakh sq. ft. by bringing multi sector-based Incubation Centers, Annex Centers, and Student Ideation Centers. Andhra University Incubation Council (ā hub) shall provide an environment to translate knowledge and innovation into the creation of successful entrepreneurs that shall help in contributing to the local economy and employment generation.

Andhra University Incubation Council (ā hub) will create an ecosystem that will foster and support entrepreneurship amongst the students and local community leading to the creation of wealth and jobs. ā hub set a goal to be one of India's largest integrated multi-disciplinary Incubation & Innovation ecosystems by the year 2025.

Technology Incubation & Acceleration

Technology Incubation & Acceleration is Located in : North Campus of Andhra University. The sector foci are Agri Tech, Defense, Environmental, AI/ML, Data Analytics, IoT, Manufacturing, Automation, Robotics, Drones, EV, AR/VR, ERP, Aerospace, HR Tech, FinTech, Edu Tech, Ports, Logistics Tech, Retail & eCommerce, Entertainment, IT Services.

- AU Incubation Center (20,000 Sq. ft.)
- AU NIDHI iTBI Incubation Center (10,000 Sq. ft.)
- STPI Next Gen Incubation Center (Phase 1 – 25,000 Sq. ft.)
- NASSCOM Center of Excellence for AI & IoT (5,000 Sq. ft.)

ā Hub Tech Annexure Centers

- THE DIGIFAC Low Code Systems (3,000 Sq. ft.)
- Rosys Center of Excellence for Drone (3,000 Sq. ft.)
- GIAT Center of Excellence for GIS (1,500 Sq. ft.)

Science Incubation & Acceleration

The Science Incubation Centre is located in Andhra University South Campus. The Sector focus is on Pharma, Food Processing-Testing-Certification, Genomics, Life Sciences, Marine:

- Element, AU Pharma Research &Incubation Centre (40,000 Sq. ft.)
- AU – DFRL Food Research & Incubation Centre (15,000 Sq. ft.)
- AU – Avanti Marine Skill Development (20,000 Sq. ft.)
- AU – RINL Genomics Research & Incubation Centre (5,000 Sq. ft.)

ā Hub Tech Annexure Center

- The Center for Advanced Applied Biological Sciences and Entrepreneurship (TCABSE)

Services of the Center

Business Advisory

- Advisory board and mentors
- Management team identification
- Access to newer technology & talent

Market Access

- Networking opportunities
- Marketing assistance & Strategic partnerships
- Access to corporates & Govt Agencies

Financial Support

- Access to bank loans, loan funds, and guarantee programs
- Access to angel investors or venture capital

Legal, Compliance & IP

- Help with regulatory compliance & accounts
- Help in IP management and legal counsel

NEP 2020

The University is at the forefront in the state of Andhra Pradesh to implement the National Education Policy 2020 with MERU orientation under multi-entry and exit options of integrated programmes at different levels with quality, equity, accessibility, and affordability as the four pillars to achieve excellence, in tune with the vision of hon'ble Prime Minister Shri Narendra Modi to transform India into an *Aatmanirbhar Bharat*. The University is striving its best to contribute its might with the vision of *'Study In India-Stay In India'* to take the country towards transformation into a global destination in education. The University, by establishing skill development centers, is synergizing education with skill development ushering in new avenues of socio-economic empowerment. One of the priority areas of the University is Rural Women Entrepreneurship Development as an overwhelming majority of the people in North coastal Andhra live with limited resources to establish and manage enterprises. AU is handholding and contributing to strengthening their capacities through different programmes in the Centre for Women's studies, Entrepreneurship & skill development center apart from $\bar{a}\bar{a}$ hub Incubation Centre.

In its journey of 97 years, Andhra University reached several milestones in education, research, and community development. It played a pivotal and its presence is recognized globally while it is all set to celebrate its *"Shatabdi Mahotsav*" during 2025-26, aiming for the skies and determined to be daring with caution, wisdom, and history informing the steps with conscious choices, to claim the primacy of place in excellence across spheres of human endeavour.

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The Idea of a Research University for Intensive Research and Excellence

D K Ghosh *

According to Philip Altbach, "Universities, since their origin in medieval Europe, have always been concerned with the transmission, preservation, and interpretation of knowledge, although not primarily with the creation of new knowledge However, humans have always been inquisitive to know and find out new things which are hitherto unknown and unrevealed. That is the reason why over time, the creation of new knowledge has become part of the core activities of a university which however is not mandatory for a university but depends on its appetite in this regard. In order to upgrade itself as a Research University, it would need huge investments in terms of high-quality faculty for research, costly infrastructure, and an overall vision for the same."

Germany is the Progenitor of Research University

Undeniably, Germany is the progenitor of the idea and concept of Research University which became a role model to the world in the nineteenth century. In his book titled 'The Rise of the Research University, Luis Menand, Harvard Professor of English and American Literature, said, "Humboldt's Ideal is a concept of academic education that emerged in the early 19th century and whose core idea is a holistic combination of research and education." His philosophy was that 'teaching should be guided by current research'.

Germany is also credited for creating the world's first University Research Laboratory in 1825. This was done by Professor Liebig of the Giessen University of Germany.

At the invitation of the King of Prussia in the early nineteenth century, Wilhem Von Humboldt who was then the Prussian Ambassador in Rome articulated his concept of education and then established the Berlin University which was later renamed after Humbolt. According to Menand, what we know of the concept of Humboldt's Research University "….the unity of teaching and research, academic freedom, the open-ended character of research-" also echoed in some of the earliest formulations in the work of Wilhelm von Humboldt, Johann G. Filtche, Friedrilch Schleiermacher, and Friedrich W. J. Schelling.

Precisely, today's research university model was first introduced by Humboldt who '. has gone down in history as the originator of the modern research-intensive university, a model of higher education which Germany was to dominate through the nineteenth century and which was so crucial to its industrialization. The institutionalization of research led to the seminar and the laboratory, both German contributions to the modern university, as was the creation of modern disciplines'.

Interestingly however, Menand also said, "By focussing on the German origins of the modern research university, we are not suggesting that a particular German plan of higher education was ever fully implemented, either in Germany or in the United States."

Turning to how the Research University developed along the lines of Humboldt's philosophy, "The early textual formulations of the research university remain important for understanding how the institution has evolved since its inception. Yet access to many crucial sources is hard to come by. Most of the classic German writings on the university either have not been translated at all or were rendered into English long ago and not very well", observed Menand.

It is strange and unfortunate too that the world does not have any authentic document about how exactly the idea of a research university was structured and developed in Germany.

Germany created its first university (Heidelberg) in 1386,177 years after Oxford and Cambridge, and the world's first research university (Humboldt University) in 1810. America had its first university (Harvard) in 1636,426 years after Oxbridge and established its first research university in 1876.

Two strange things happened in England for too long like in no other country. One was that in

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order to prevent any rival institution to come up, Oxbridge persuaded the King to issue Proclamation that without his orders, no institution should be established. Even their students were forbidden to teach anywhere else. This was in force for over 600 years. It was only in 1826 that due to pressures of activists for quite some time, the first institution - University College, London, was established.

The other was while in England, research activities were carried out in independent research institutes, Oxbridge stayed away from research and concentrated on collegiate education for which it has a global reputation.

One reason why Oxbridge did not provide for research activities, could be that Henry Newman, an evangelical academic at the University of Oxford who was a well-respected figure in those days, was opposed to research work at universities. Newman, author of the famous book "Ïdea of a University" held a diametrically opposite view to that of Humboldt's philosophy of research. Interestingly, both were contemporaries. Newman believed universities are meant only to teach students.

However, Steffan Collini Cambridge Professor said in his book What are Universities For? "Ï have suggested we should not delude ourselves into thinking that the 'Idea of a University' describes an institution that at all closely resembles the universities that we have today or that it provides us with arguments which are likely to be readily effective in their defence."

The first D. Phil (as called in Oxford) was awarded by Oxford as late as in 1917 while Cambridge awarded its first Ph.D. in 1921. Germany's first Ph.D. was awarded in 1652 by Frederich Wilhelm University and America was awarded its first Ph.D. by Yale University in 1861.

In his book titled 'A University Education' (2017), the author David Willets, former Minister for Universities and Science lamented how Britain found itself behind Germany and USA in this regard in the following words--

"Britain had nothing comparable to Germany's research-intensive universities through the nineteenth century": just restoring standards of teaching had been the main focus of the Oxbridge reforms of the 1850s" Willet added that "The technological challenges of the First World War finally prompted a surge of policy initiatives because of a recognition of how far we have fallen behind Germany."

But in the changing time, Oxbridge has caught up and excelled in research leaving behind all institutions of Germany. Both have consistently secured top slots in world university rankings not only ahead of Germany and but many top American universities.

Even all other universities of UK have consequent to the post-Thatcher cuts of funds to universities on a selective basis, upgraded themselves for research activities to generate funds. All universities in UK have a stable income from research activities both domestically and or internationally.

The Rise of American Research University

Today, when we talk of a research university, we certainly refer to America's research-intensive universities. America's Johns Hopkins University was the first research university established in 1876, following the idea and concept of Humboldt's idea of a university. One reason why American academic leaders were so overwhelmed with German ideas on higher education was that almost all the stalwarts at that time was educated in Germany.

After American independence, academic leaders like Charles Eliot, President of Harvard University for forty long years gave a new idea of education that America needed that time and shaped higher education accordingly, creating a new version of Research University which is what has turned out to be the role model to the world in the twentieth century.. However, Americans hugely acknowledge Germany's contributions to the idea of a research university.

Gold Standard of American Higher Education

In America, initially, the following "fifteen universities collectively determined the gold standard in American higher education- a model the potential and limitations of which we asses from various perspectives", observed Michael M Crow. They are, according to the historian Geiger (1) five colonial colleges chartered before the American Revolution (Harvard, Pennsylvania, Princeton, and Columbia,(2) five state universities (Michigan, Wisconsin Illinois, and California), and (3) five private institutions (MIT, Cornell, Johns Hopkins, Stanford, and Chicago.

Contribution of Liberal Funding Build American Research Universities

Liberal Funding for Federal Research helped Build American Research Universities a lot. Vannevar Bush who was Dean of Engineering at MIT in 1932 and later President of the Carnegie Institution always felt that leading universities are the right places for various research activities of the federal government for they are the ones who have both brilliant and committed academics and scientists to carry out research. Bush was later appointed as the Chairman of the National Defence Research Committee(NDRC) at the invitation of President Roosevelt. That was the time when Germany invaded Poland which led to the Second World War.

Post War, in 1945, Bush had suggested to President Truman also, who succeeded Roosevelt, that the leading universities of America should be the base of federal research. That led to liberal research funding. Consequently, "By 1960s, it was said that it had become difficult to tell whether MIT was á university with many government research laboratories appended to it or a cluster of government research laboratories with a very good educational institution attached'.

Meanwhile, in 1950, National Science Foundation(NSF) came up to liberally fund research activities of research-intensive universities.

Behind the growth of research universities in America, Vannevar Bush's name is invariably mentioned because of whom initially front-line universities were chosen by the federal government for their research activities which however did not continue for long.

The Mission of Research University

Daniel Coit Gilman, the first President of the first Research University of America- Johns Hopkins- defined the Mission of the Research University in the following words which remains true even today-

"To educate its students and cultivate their capacity for lifelong learning, to foster independent and original research, and to bring the benefits of discovery to the world." Or, summed up in a simple but powerful restatement of Gilman's own words: Knowledge for the world"

Unfortunately, when one looks for literature about how the Research University in America grew and what processes and norms it followed that led to America's own version of Research University which is different from the German model, one does not come across any literature to rely on. That is why Menand said that.

"Some of the most consequential English-language writings on the early American research university are surprisingly difficult to track down".

What a Modern Research University Should Do?

What a modern Research University should do has been beautifully described by Prof. Jonathan R. Cole of Columbia who was its Vice-President and author of the famous book 'The Great American University in the following words, mentioned in his latest book 'Toward A More PERFECT University'.

"Although the transmission of knowledge is a core mission of our universities, it is not what makes them the best institutions of higher learning in the world. We are the greatest because our finest universities are able to produce a very high proportion of the most important fundamental knowledge and practical research discoveries in the world. It is the quality of the research produced and the system that invests in and trains young people to be leading scientists and scholars, that distinguishes them and makes them the envy of the world."

In the context of the current global environment, Michael Crow appears to have defined what a modern research university should be, as expressed in the following worlds.

"The integrated research, development, and education functions of research universities contribute to the production and dissemination of new knowledge and through its utilization become catalysts spurring regional, national, and global economic development. Through the development of products, processes, and applications across a range of fields and markets, academic research demonstrates the potential to generate significant economic returns, a process that invigorates the broader economic contributions of universities"

In America, out of about 5000 institutions of higher education, the Carnegie Foundation for the Advancement of Teaching categorized only 108 of them, both public and private as major research universities" Later, another approximately one

hundred additional universities with less extensive research portfolios comprised a second cohort.

Challenges before American Research Universities

In general, currently, research universities in America are starving of funds, and consequently research output and earnings are at their low. In the world university rankings, American universities have been losing to more institutions of UK including some newer ones from Asia (China and Singapore).- as would one find in the top twenty of the world university rankings. China's Tsinghua University snatched the world's first position for best research papers in 2020-21. Both Tsinghua and Peking Universities have grabbed and retained their positions in the top twenty of the world's university rankings. In 2011, Tsinghua's rank was 58 which continued to climb the list, and in 2022 and again in 2023, it grabbed the 16th rank. Two Beijing-based universities are among the top 10 academic institutions in the Nature Index.

Realizing the downturn of American universities' research leadership, the US Congress wanted to know the reasons and asked its National Academies to report the top ten reasons. With the title "Research Universities and the Future of America", the Committee made ten Recommendations and they are (1) Federal Action (2) _ State Action(3) Strengthening Partnerships with Business (4). Improving University Productivity,(5) Strategic Investment Program,(6) Full Federal Funding of Research,(7) Reducing Regulatory Burden,(8) Reforming Graduate Education,(9)STEM Pathways and Diversity and (10)International Students and Scholars.

Broadly, these recommendations when implemented would help universities to rejuvenate their research in particular with full funding from the federal government. The Biden government has promised liberal funding for research so that America could come back for vibrating path-breaking research in their laboratories.

Research Challenges Before Universities in Europe

Generally, about 40% of the world's best universities are from Europe. While UK takes the top spot in the rankings, German universities take the next position, as Europe's second best country of top class universities. Of total research activities in Germany, 17% are carried out in universities.

A survey of more than 200 higher education institutions across Europe has found that the need to provide additional resources, considerable amounts of co-funding, and ensure long-term sustainability are the biggest challenges for participating in the European Universities Initiative.

While resource scarcity is the priority challenge, there are other challenges too such as faculty incentives both in terms of their share as also for promotions, lack of expertise to negotiate with industry, timely market information, legal issues, etc.

In Australia, universities are facing funding scarcity for; the federal government's priority is medical research. Coming to industry, the latter lament for; not being big enough like America. In Japan, firstly industry is sceptical of faculty delivery and speed and moreover, many prefer to invest in high-quality publications, rather than collaborative research.

Precisely, Research Universities whether in America, Europe, or elsewhere, are all starving of research funding. Strangely, when in the context of the knowledge economy, governments should invest more in research to strengthen the economy, one finds them rolling back their earlier liberal policy in this regard.

Applied Research in Research University

Broadly, contributions of research universities the world over in particular in USA and UK have benefitted both humans and the economy. In this connection, in USA, a Committee of the National Research Council charged with evaluating technology transfer activities and intellectual property rights stemming from publicly and privately sponsored research within the context of the public interest produced a synopsis that suggests the scope and complexity of the commercialization of academic research which runs as follows:

"Discovery, learning, and societal engagement are mutually supportive core missions of the research university. The transfer of knowledge to those in society who can make use of it for the general good contributes to each of these missions. The transfers occur through publications, training, and education

of students, employment of graduates, conferences, consultations, and collaboration as well as by obtaining rights to inventions and discoveries that are quality for patent protection (intellectual property, or IP) and licensing them to private enterprises. All of these means of knowledge sharing have contributed to a long history of mutually beneficial relations among US public and private universities, the private sector, and society at large."

Research in Indian Universities

For the first time, the Economic Advisory Council to the Prime Minister,(EAC to PM) in its Report on R&D Expenditure Ecosystem-Current Status and Way Forward,(2019) while assessing the R&D expenditure of the country by various stakeholders, inter-alia made the following observations about research activities in Indian universities.

"… universities play a relatively small role in the research activities of the country. This is in contrast to the scenario in advanced countries where universities play a critical role in creating the talent pool for research and generating high-quality research. In India, publicly funded research is concentrated in specialized research institutes under different government departments.

This leaves universities to largely play a teaching role – a decision that goes back to the 1950s. It is now widely acknowledged that whatever the merits of the decision at the time, this disconnect has severely impaired both teachings as well as the research enterprise in the country.."

Turning to the current state of research in Indian universities, a UGC appointed Committee has made the following observations:

"There is a consensus that barring a few exceptions, the overall quality of University and College level research in India is far from satisfactory. Indeed, in many institutions, the quality of research is alarmingly poor. In a large number of cases, these do not conform to international standards and do not make significant contributions to theoretical or applied aspects of a given discipline."

Now the UGC Committee has recommended, "Every university must appoint a Dean of research and development, who will be responsible for ensuring the smooth functioning of all externally funded research grants/projects in the institution. The Dean of R&D should be a senior member of the faculty with significant research experience."

Triple-Helix: Government-University–Industry for Successful Collaboration

Globally, triple-helix is considered a sine-qua-non for boosting university-industry collaboration. In the triple-helix, the supporting and encouraging role comes from the government to make favorable policy and support offering incentives for the industry in terms of favorable policy for business, tax concessions, various industry-friendly facilities, etc. That encourages the industry to approach academia for innovative ideas that would effectively help it compete with others-domestic and international companies, depending on the size and appetite of the industry.

In the Indian context, for certain obvious reasons, institutions like IITs and IISc and a few other institutions have an in-built culture of industrial collaborations-products and services. Save these institutions, university-industry linkages could not be developed in most institutions. .Moreover, unless industry interaction is considered for promotion and selection, even teachers would not be interested in their basic job of teaching. However, there are always some individual teachers who are always doing some collaborative work with the industry. That however is a small number..

Admittedly, university-industry collaboration grows only when the university has to offer its own R&D capabilities- with expertise and some basic facilities- so that the industry could be attracted to invest in collaborative work.

Despite the overall impression that universities in India have a dismal record of research and industry linkage, some have been doing credible work. For example, Jadavpur University, Anna University, and Manipal Academy. Some other universities also are included in this group which has a reasonable record of Sponsored Research activities with less industry linkage.

Looking Forward

For the first time, an exceptional recommendation has emerged from the NEP, 2020 for the creation of the National Research Fund(NRF) to fund research activities in universities. it is

strongly hoped that universities would now have adequate opportunities to conduct useful research that would help the country to be recognized for its high-quality research and innovations.

India has over 1000 universities and equivalent institutions with a large pool of brilliant faculty and talented students to grow into and join the league of world-class institutions. Currently, our premier institutions like IITs, IIMs, and IISc enjoy a global reputation. Some of these institutions are gradually climbing the ladder of world university rankings and will improve further sooner than later. The rising tempo would surely help achieve the goal with adequate funding for upgradation and autonomy.

The formally declared, Institutes of Eminence(IoE) have already gone through a number of rigorous scrutiny and processes. Such Institutes which include some first-generation IITs are expected to grow into world-class institutions.

Institutions themselves need to flag their potential and appetite to grow into world-class. Funds and high-quality professoriate by inducting the best faculty wherever they are would accelerate the process. It is well known that Ivy league universities have always followed the golden rule to get the best faculty wherever they are in the world.

Admittedly, liberal funding is a prerequisite to building high-quality institutions with infrastructure and research laboratories coupled with reputed faculty to enter the league of world-class institutions. More recently, we have examples of a few universities in China, notably Tsinghua and Peking, who have secured high ranks in the world university rankings. In the 1990s, China had originally planned to upgrade 100 universities to world-class, but soon it realized that was not possible. then introduced the C9 plan to fund liberally nine select universities which included Tsinghua and Peking universities to achieve world-class. F*or publishing a paper in Nature up to USD 165,000, ie 20 times the annual average salary of an academic is paid as an incentive.*

Tsinghua and Peking are the two top universities having already achieved world-class recognition. China had invested billions in upgrading these universities both in infrastructure and inducting faculty from America including a number of Chinese diasporas from reputed American universities, by giving huge incentives. That is one of the reasons why a number of universities could achieve world-class recognition in a relatively short time.

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Pragmatic Education Policy: Implementation Strategies in Research and Technology

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It is predicted that India will be the largest economy in the world by 2030-2032 with an estimated GDP of 9 trillion dollars. It is evident that the nine trillion economy will be driven by knowledge resources and not by the natural resources of the country. In this regard, the present dispensation has introduced a comprehensive National Education Policy 2020. This is in lieu with the PMs recent call on leveraging the Fourth Industrial Revolution to take India to new heights. This policy is a water-shed moment for the Indian Education System, which is bold, comprehensive and envisages large scale transformational well-reasoned reforms.

A competently written compendium, the policy overhauls the existing education system by bringing about a pragmatic shift in its content. In the arena of Higher Education NEP 2020 has outlined an ambitions task of making education more holistic, flexible, multidisciplinary, creating multi entry and exit points in a four year degree program, catalyzing research, improving faculty support and encouraging internationalization. It seeks to bring about a paradigm shift through its transformational reforms in education on the foundational pillars of Access, Equity, Quality, Affordability and Accountability, and is aligned with the 2030 Agenda for Sustainable Development, and aims to transform India into a vibrant knowledge society and global knowledge super power. Our huge human resource potential to be realized and tapped needs the effective implementation of this dynamic policy. It is heartening that the policy states education as a public good and public education system is the foundation of a vibrant democratic society. It is public education that contributes to the building of nations, culturally, and technologically and the building of a humane society.

The underlying aims of Higher Education is to develop good, thoughtful, well-rounded, and creative individuals. The Higher Education Institution's will offer holistic and multidisciplinary quality education that will enable students to study one or more specialized areas of interest at a deep level, and also develop character, ethical and Constitutional values, intellectual curiosity, scientific temper, creativity, spirit of service, and 21st century capabilities across a range of disciplines including sciences, social sciences, arts, humanities, languages, as well as professional, technical, and vocational subjects.

Indian Higher Education is the second largest educational system in the world, and has a great potential to compete with global universities. In order to realize the contributions of higher education to nation building, a transformative and innovative approach would be required across all pedals of higher education, from curricula and pedagogy to the use of technology to partnerships, governance and funding. Building rapid progress for future higher education would require a committed and concerted effort from all stakeholders involved i.e. academia, industry, and Government. For capital human capital theory, higher education is an effective tool to develop science and technological capabilities that are required for a standard of living in a global knowledge economy. (e.g. Ding and Zeng, 2015). Economies are moving from manufacturing based economies towards knowledge-based economies that rely heavily on scientific research and a trained workforce. Nations no longer compete for industrial capacity or access to natural resources, but skilled workers, intellectual property and knowledge.

Significance of Research and its Implementation

In today's world, research and innovation constitute the neo-quantum of the academic strength of a nation. India intends to impact the global academia by remarkable contributions in research by expanding the frontiers of human intellect. Hence, it is pivotal to develop a robust system that fosters research and innovation. In this direction, NEP 2020 has proposed the National Research Foundation to facilitate research. This will give an impetus for path breaking research activities. Vibrant research and innovation culture across higher education

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institutions is of great significance. Research labs and other research organizations are the backbone for innovations in a technology driven competitive world. NRF would play a very crucial role in creating a culture of high quality research and build capacity in disciplines that are critical. There is an urgent need for a significant expansion of research capabilities and output across disciplines.

A String of Suggestions for Implementation is Imperative

NRF should be legislated as the key central funding agency to govern and regulate all research activities. NRF needs to be competitively funded for all disciplines to successfully carry out research through close linkages with government agencies as well as industry and private/ Philanthropic organizations in India. NRF should strive to play a major role in funds by bringing all the funding agencies onto a single platform. It should collaborate partnerships to harness the collective intelligence of networks and, NRF should advocate an audit and ranking of research at the University level that will act as an impetus to higher educational institutes to bring about quality research. Encouragement should be given to collaborations both national and international through research conferences, exchange programs to enhance productive research is essential.

It is of paramount importance that both the central and state governments allot a fixed fund for research in the budget as a regular budgetary commitment. In order for research to be given due importance and recognition, the research and innovation investment, which currently stands at 0.8% of GDP, needs to be enhanced to at least 2% of GDP. To attract funds, universities should secure intellectual property from their research or to actively court private industries. It should provide a competitive access to government research grants through a merit-based system to incentivize and support Research and Development activity. It should also be necessary to note that there should be role clarity between NRF and other funding agencies such as DST, DAE, ICAR, ICMR, DBT, ICHR, UGC in the allocation of funds and monitoring of research. The funding bodies should be committed to embedding quality and diversity for research in all fields.

It would be pertinent to mention that, the projects funded by NRF should strictly adhere to create a national research credit bank for all those it funds and monitor the output of their research. To foster research publications, integrated national digital library membership should be made compulsory in all HEI's by converting their libraries into digital libraries and there should be access to books, periodicals, journals, patents. This will aid in multiple subscriptions of library resources to be eliminated and thereby decrease government expenditure on library resources.

In order to maintain sustainable quality, the college faculty should be encouraged to publish open access scholarly research papers with copyright certificates from government of India and more significantly patent submissions. As there is a dearth of research guides, the services of retired professors in this direction would be beneficial and highly qualified and proven researchers should head various research agencies. NRF should act as a liaison between researchers and industry, which will further aid in policy making. Students should be expected to conduct research based on industry internship and publish scholarly papers and own patents during their degree education. It would be edifying to note that all Universities should start their own digital publication units in order to bring out high quality research at par with global indexing agencies.

Significance of Research Universities

Research is a tool for building knowledge, facilitating learning and an essential component in generating knowledge. Research Universities have the capacity to produce powerful academic structures and make it possible for nations to compete in a sophisticated, global and in-depth knowledge economy. These universities are intrinsic to the success of any contemporary, knowledge-based economy. Our research universities should be nationally and internationally recognized for the quality of its research and the breadth of its research outputs and create an environment that is entirely conducive to scholarly pursuits. The university should hone research on areas of critical importance and represent a perfect choice for international students looking to get involved in world-class research in an innovative, diverse and welcoming environment. There should be diverse

research programs that engage in a complex, global society, instilled with an awareness of issues in sustainability alongside an in-depth understanding of varied cultures and differing international perspectives. The university should be known for its ground-breaking education model, global character and cross-disciplinary approach to its academics and research. The research university through its high – quality programs and impactful research must seek to expand knowledge through basic and applied research, serving diverse economic, cultural and societal needs of its local, state, national and international constituencies. Research universities should overcome the trend of becoming more and more specialized, and instead try to integrate undergraduate teaching and research to create a true community of scholars. Nobel Prize winners should be associated with research universities for guidance and direction. Research Universities should attract scientists, scholars and students from around the globe to carry out cutting-edge research and learn from leading authorities. These universities require investment in State-of-the-art facilities. Specialized research infrastructure is the key to the production of quality scientific discovery. A Research Excellence Framework for assessing quality of research is essential. It should include all forms of research output that should be assessed on a fair and equal basis, including interdisciplinary and collaborative research.

Implementation Pathways for Research Intensive Universities

Research Universities should form regional academic alliances to build enough strength in selected fields to promote participation in global science. There should be a linkage to global academic system of science and scholarship so to understand advanced scientific developments and participate selectively in them. There should be creation of a differentiated academic system for research Universities with diverse missions, structures and patterns of funding for at least 80% of competitive research funds. Universities too should take the onus for long term financial sustainability for research through proactive diversification with enterprises including cross-border Consortia, Foundations and other private sources. At the National level a Flagship Research University should be established for leadership in higher education. The funding of research universities and merger of research universities to provide better economies of scale greatly aids in economic use of funds. Funding of research Universities must be available on a sustained basis. Social Sciences and humanities should be included alongside hard sciences. An approximate mix of funding sources and regulated allocation mechanism encourage innovative research ideas. Research universities need autonomy to shape their own programs, manage their budgets and the academic community. Faculty should be highly trained, committed to research and scholarship. Local research universities need to focus on local needs by bringing international scientific trends to bear on local problems and contribute to the development of domestic industry, agriculture and society. Research universities have a responsibility to disseminate research and analysis in local languages. Research Universities provide the skills needed by 21st century economies and societies and reflect the best academic values.

The role of research Universities in advancing society and the economy is multi-faceted and highly important. In fact, the importance is so high, it is crucial for national leaders and decision makers to have a thorough and shared understanding of the functional benefits generated by them.

Internationalization of Education-Measures for Implementation

Vishwa Guru, envisioning India as a global destination for providing premium education at affordable costs is a right step for internationalization of education. The encouragement to high performing Indian Universities to set up campuses abroad and permitting selected Universities among top 100 Universities in the world, to operate in India is laudable. To start with the government should ensure only not for profit institutions offering multiple programs to set up campuses in the country. Measures should be taken to establish an overall policy reform that encompasses the specific courses to be offered, exchange programs, affiliation, international scholarships, international collaboration, funding and networking activities that are to be taken up. Steps should be taken to synchronize Indian credit system with international credit systems and enable credit transfer between Indian and international credit systems.

Digital Infrastructure and Adoption of Technology

Technology is the cornerstone to democratize education and it can create powerful communities. It has played a pivotal role in enabling the shift, especially in cities and towns with high speed internet connectivity. In the 21st century, knowledge of internet usage is a fundamental human right considered at par with reading and writing. The policy is vocal about digitalization in education, but the challenges of disparity in between regions, population, classes, delayed infrastructure development, bandwidth availability should be addressed. The most important element that supports the use of technology in the educational system is the internet. E-learning has become one of the fastest moving trends in education and poses a promising alternative to traditional learning. Knowledge of internet usage is a fundamental aspect that should be inclusive.

The policy lays emphasis on leveraging the benefits of technology in making the youth future ready. This noble initiative will be successful only if the government works on improving the basic infrastructure that will support the digital infrastructures as majority of the rural institutions lack digital class-rooms, remote expertise driven teaching models, AR/VR tools that are essential to bridge the gap between physical teaching and laboratory. It has been proposed that the key to the continued viability of institutions of higher education in light of increased competition in the global market place will be their adoption of learning technologies that increase flexibility, access and convenience (Smith and Oliver, 2000).

Technology plays an important role in facilitating learning. It has facilitated many effective educational methodologies such as self-directed, independent and collaborative learning. It can connect people whom, separated by schedule and location, might otherwise not be able learn from each other. And it can provide the opportunity of receiving immediate feedback assessment, making learning appear comparatively more achievable than it would without instant feedback. The strategic expansion of the higher education system to increase access to education for all social groups and geographies through virtual class rooms becomes a reality only when, especially in rural areas, internet connectivity is easily accessible, given the fact that it is nearly non-existent, making digital learning a major challenge even after tremendous growth of ICT. This calls for a timely summon to enhance the use of technology in education to achieve greater understanding by students across all disciplines.

Research has demonstrated that smartphone applications and the internet are introducing a new degree of responsiveness and flexibility, within educational process. This responsiveness is facilitated by the ease with which content can be updated, instruction can be personalized, information can be accessed, information can be distributed, and content can be standardized. (M.J. Rosenberg, John Cradler)

In order to realize the vision of NEP 2020, there should be experiential learning and industry-academia partnerships. In this context, blended and online learning will be crucial and hence it is important that the government allocate appropriate funds to develop digital infrastructure in all areas of the country. Many students rely on technology for their academic needs; technology contributes to the long-term retention of knowledge and acquisition of skills such as interpersonal communication, psycho-motor and cognitive skills within different courses.

We have witnessed a tremendous growth in the information and communication technologies that has revolutionized the business practices and strategies of entire industries and the field of higher education is not exception to this phenomenal. Application of information technologies in the education sector is also referred as educational technologies

In the upcoming budget, there should be allocation of funds to develop digital infrastructure across the nation, especially in rural India. The Government needs to evaluate the ground situation and spend on assets for the long run that includes smart class rooms, internet connection and skill up-gradation of teachers in line with NEP–2020. Teachers also need to adapt to the changing pedagogy and restructure their teaching methodologies. It has also been pointed out that, by comparison, those with a high level of technology in their teaching may be better at instilling students with a desire to learn and the development of critical thinking skills. (D.Ritchie, K.Wiburg)

(contd. on pg. 32)

Action Research: An Effective Micro-level Strategy to Deal with Classroom Dynamics

A Joseph Dorairaj*

Research in any domain is a long-drawn process dealing with a formidable problem and backed by a chain of resources, human, material, and conceptual-theoretical. But at the other end of the spectrum, we have action research which is not time-consuming and could be managed with meager resources, especially financial. Most importantly, it is practitioner-driven and context-specific where the need for an outsider expert is not felt acutely.

Kurt Lewin, a German-American social psychologist, carried out action research in the U.S. in the 1940s and the Tavistock Institute in Britain joined hands with him. "Action research for Lewin was exemplified by the discussion of problems followed by group decisions on how to proceed" ("Kurt Lewin and the Origins of Action Research" 9). In Lewin's perspective, the focus of action research was problem-solving and was usually collaborative.

The SAGE Handbook of Action Research defines action research as "a family of practices of living inquiry that aims, in a great variety of ways, to link practice and ideas in the service of human flourishing. It is not so much a *methodology* as an *orientation to the inquiry* that seeks to create participative communities of inquiry in which qualities of engagement, curiosity and question posing are brought to bear on significant practical issues" (1). Nunan in *Research Methods in Language Learning* describes action research as "a form of self-reflective inquiry carried out by practitioners, aimed at solving problems, improving practice, or enhancing understanding" (229).

A scrutiny of the term 'action research' reveals that it is fundamentally a research project, however modest it may be, that is not entirely speculative and theoretical but one that involves or leads to action. Therefore, the collocation of 'action research' signifies a chain of activities aimed at addressing and, if possible, solving a teaching-learning problem emanating from actual classrooms leading to a better understanding of the problem and subsequently the enhancement of the teaching-learning process where the chief beneficiaries are the students. But at the same time, there is considerable space for speculation and reflection which serve as the prelude for any meaningful action or intervention. In short, action research attempts to close the gap between *theoria* and *praxis*.

Somekh talks about five differences between action research and other forms/types of research. In an article titled "The Contribution of Action Research to Development in Social Endeavours: A Position Paper on Action Research Methodology," she throws light on these differences. She writes: "the first main difference . . . is that it is carried out by people directly concerned with the social situation that is being researched . . . A second major difference is that the findings of action research are fed back directly into practice with the aim of bringing about change . . . A third major difference is that action research has a highly pragmatic orientation . . . A fourth major difference is that action research is grounded in the culture of the social group whose members are both participants in the research field and researchers. It may be instigated by an individual, but its momentum is towards collaboration . . . Finally, a fifth major difference is that . . . it is impossible to draw a line between data that have been collected as part of the research and data which are available to the researcher as part of the job" (340-342).

The outstanding feature of action research is that it is carried out by the teacher him/herself who doubles up as a researcher. Usually, there is no outside expert or consultant. The teacher may not be an expert in that particular domain but he/she can still undertake decent research, for action research is a context-specific mini-project undertaken over a limited period of time, usually a semester or so, with meager resources to address real issues or problems. Academic rigor is not sacrificed at any stage of action research and research protocols are not thrown to the wind. The high point is that when

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compared to an outside expert, it is the practicing teacher who has an intuitive understanding of the classroom situation and the learners and has also a gut-level knowledge of what might work in a given situation. This situational knowledge gives him/her an edge over the outside expert who lacks the context-specific knowledge to address a specific, sometimes sensitive, issue or problem. Nunan points out that the classroom practitioner is the "prime mover in the action research process" (*Learner-Centered English Language Education* 270).

The fact that the teacher leads the research project from the front empowers him/her and sends out a strong message to his/her academic peers that they too can undertake action research projects focussing on the actual teaching-learning problems they encounter routinely. This, in a way, motivates teacher-researchers to solve teaching-learning issues with the resources internally available rather than look for external help. Mertler points out that "action research is largely about developing the professional disposition of teachers and the teaching profession. Through action research, teachers are encouraged to become continuous, lifelong learners in their classrooms with respect to their practice" (16). This minimizes the dependency syndrome and helps the teacher-researchers realize that they are in a sense more competent than outside experts to deal with their practical classroom issues, for they have a better and inside knowledge of the issues or problems and the different stakeholders involved in the teaching-learning process. Kemmis, McTaggart and Mixon argue that "that insiders have special advantages when it comes to doing research in their own sites and to investigating practices that hold their work and lives together in those sites—the practices that are *enmeshed* with those sites" (5).

Another salient feature of action research is that it is usually collaborative, though collaboration is not a mandatory feature of action research. In real life, teachers, both within a particular subject like English or History or Management and across subjects, share their classroom practices and problems, both success stories as well as disappointments, formally as well as informally with their colleagues during breaks. This could also happen over a cup of coffee in cafeterias. Such information sharing may occasionally inspire or motivate a teacher to take up a particular issue, study it further and suggest a possible remedy. In many cases, this is how action research is conceived and born. In a few cases, the teacher-practitioner reports back to his/her colleagues, both formally and informally, on the progress of his/her action research project and even seeks suggestions to carry it forward or circumvent the roadblocks that he/she has encountered. Occasionally, the teacher-practitioner may consult an expert if he/she is unable to take his/her research forward.

As discussed earlier, though action research typically involves mini projects, it does not compromise on academic rigour and does not short-circuit research protocols. Since it is a proper research project, it involves data collection, usually qualitative, analysis and interpretation of the data collected, and drawing logical conclusions. Case studies are usually the norm and at no point is there any watering down of research procedures and protocols. May points out that action research is "always field-based, in lending itself to ethnographic methods such as keeping fieldnotes or journals, participant observation, interviewing, engaging in dialogue, audiotaping, collecting and analyzing documents and students' work. These methods provide more detailed, rich databases than do simple tests or surveys" (118). There are, of course, other strategies for data collection.

Action research unfolds itself in the form of a cycle or spiral. Somekh points out that "Action research directly addresses the problem of the division between theory and practice. Rather than research being a linear process of producing knowledge which is later applied to practice settings, action research integrates the development of practice with the construction of research knowledge in a cyclical process" ("Action Research" 89). The typical action research cycle involves a four-fold process which includes: observing, reflecting, planning and acting. And this is iterative, for the cycle continues. Once something has been initiated as part of intervention measures or strategies, that is subjected to further analysis and review and hence the metaphor of a spiral is sometimes used to talk about the process of action research, for it "promises closer and closer approximation to an ideal solution of the problem, based on genuine theoretical understanding of the processes involved" (Hammersley, 166).

Nunan outlines seven steps that are involved in the action research projects: Initiation, Preliminary investigation, Hypothesis, Intervention, Evaluation, Dissemination and Follow-up (*Research Methods in Language Learning* 19). And this turns out to be an ongoing cycle. The weak spot in the link is dissemination, for most teachers are reluctant to talk about their actual classroom issues and problems either because they are shy and diffident or because they harbour a misconception that talking about their problems will show them as inept and incompetent. They are also usually reticent when it comes to talking about or sharing their success stories with regard to action research projects.

Teachers need to undertake more action research projects in the field of English language studies, especially in the domain of teaching English as a Second Language (ESL). There is no point in looking to the West for solutions that we face in our typically Indian classrooms, for the context is alien and incompatible. Secondly, practising teachers are the best sources to provide solutions for actual classroom issues and problems because they have an intuitive understanding of what works and what doesn't.

Revision of essays is a thorny issue for many students at the secondary and even tertiary levels in almost all subjects. Whether it is English Chemistry or Sociology, students, especially at the tertiary level, do not have the competency to revise their compositions and make them better. A group of teachers including me used to talk about this informally and we realized that there was a huge difference in the manner in which advanced learners revised their compositions and slow learners revised theirs. While the advanced ones were able to look at their writings fairly objectively and make corrections both at the macro- and micro-levels, their counterparts lacked a perspective and were stuck at the micro-level correcting a few spelling errors and inserting/deleting a few punctuation marks.

Sometime back when I was teaching a batch of UG students my university writing skills, I stressed the importance of perspective and clarified how it played a major role in revising compositions. I made my students, especially the slow learners, realize that revision has to be undertaken both at the macro- and micro-levels. I helped them understand that revision in most cases called for structural changes and reorganization. This exercise, actually a series of compositions, went on for more than three months. I used many examples to help them understand the meaning and importance of perspective and the concept of reorganization. My colleagues too from other departments reported that they too helped their students realize the importance of reorganizing their essays making structural changes, wherever necessary.

This action research project involved the usual four phases: observe, reflect, plan, and act. I looked at their essays over a period of time and analysed their writings and came to the conclusion that they were unable to revise and reorganize their compositions and could carry out only superficial micro-level corrections like rectifying spelling errors. Based on the data available, I hypothesized that slow learners lacked a perspective and this motivated me to teach them the meaning and implications of perspective through various analogies and examples and classroom practices. Once the students became somewhat familiar with the concept of perspective, they were able to revise their essays in a slightly better manner.

EFL teachers should take up action research projects to address practical classroom issues. The advantages of action projects are many. Firstly, it helps practicing teachers identify knotty issues in the teaching-learning process and strategizes appropriately with a view to addressing them. As a result, the teaching-learning process improves where students are the beneficiaries. Secondly, these success stories could be shared and published in journals. In the 'publish or perish' scenario, teachers are constantly looking for new ideas and insights to write articles. They should be encouraged to narrate their success stories in the form of journal articles and this will certainly inspire their peers to take up similar projects. Thirdly, research funds have almost dried up in many agencies and organizations and as a result, the number of projects and publications has drastically come down. Against this backdrop, teachers could be advised to take up action research projects which could be managed with meager resources. Lastly and most importantly, action research projects empower teachers and instill in them the confidence that they are capable of addressing

and solving their classroom issues and problems, however complex they may be. Practicing teachers should minimize seeking ready-made solutions from foreign experts who lack critical knowledge of our classrooms and their dynamics. Instead, they should opt for action research projects which will give them the competence and confidence to work out appropriate strategies to deal with their classroom dynamics, especially at the micro-level.

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The budget should provide and incentivize to set up research and technology up-gradation and accessibility. The private sector should also fund through their own resources or through CSR on research and technology .External commercial borrowing and Foreign Direct investment is essential to boost quality and research.

The policy needs to be very loud and clear on the guidelines to increase digital literacy.

Conclusion

In conclusion, NEP–2020 is truly visionary, aspirational and comprehensive, bringing about a paradigm shift in all spheres of education. Strategic planning and a larger vision that correlates economic development to transformation in the education sector, particularly in higher education and research will go a long way in making our nation globally competitive. The newness of the vision shall focus on the genius and capability of our people and our civilizational ethos, create the desired intellectual, economic, and social value and also prepare the road-map to achieve the vision, aligned with our excellent policy foundation. We look forward earnestly with a sense of pride and hope for its successful implementation.

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Strategies for Increasing Intellectual Property Filing from Indian Universities to Promote Innovation and Entrepreneurship

Anindya Roy Chowdhury* and Purushotham**

Intellectual Property (IP) refers to the creation of the human mind. It is the DNA of the innovation and entrepreneurship ecosystem in any country. The present article focused on the IP culture in India, especially, in academic institutions, discussed the initiatives by Govt of India and a case study of Andhra University creating an IP ecosystem, and finally offered some strategies to increase IP filing from HEIs in India. An analysis of IPR scores obtained by the academic institutions participating in the NIRF 2022 showed that about 92% of them scored less than 1. The strategies suggested in this study may be helpful for academic and research institutions in India to raise IP awareness and encourage innovation among the faculty and student communities, and consequently increase the IP filings from HEIs.

Creativity, innovation, and entrepreneurship are crucial for a country's overall growth and development. Intellectual Property (IP) is the DNA of the innovation ecosystem of any country and refers to the creation of the human mind. IP Rights obtained from the government allow the owners to profit from their creative works and prevent others from copying or unfairly profiting from the same. IP rights are territorial—patents issued in one country are valid in that country only. Therefore, to obtain the right in other countries, the applicant needs to file in those countries. The creation and protection of IP is an indicator of research and education quality, and therefore, quite important for academic institutions to achieve excellence nowadays. The most common types of IPs created by academic institutions are Patent, Copyright, Design, Plant variety, and Semiconductor IC layout.

There are broadly two kinds of research in academic institutions: Basic and Applied. A patent can be obtained for applied Research for solving practical problems in the real world and yielding commercially viable technologies. Copyright may be applied to any book, paper, music, or another form of creative work produced by faculty or students. Any new engineering instrument or product design can be protected as a Design. The Semiconductor IC Layout will secure any novel semiconductor integrated circuit design.

India is home to 17.6% of the world's population (India Population, 2021). There are about a thousand universities and a large number of degree-awarding institutions with a total enrolment of 37.4 million students in 2018-19 (Nanda, 2019). However, India is ranked 40th in the Global Innovation Index (Global Innovation Index (GII), 2022). Although India ranks 3rd in the world for publishing peer-reviewed research papers (NSF, 2021), the country shares only 1.6% of global patent filings and 0.96% of industrial design registrations (Sharma & Sharma, 2021).

IP Culture in India

Figure 1 shows the increase in the number of patent applications, trademark applications, design applications, and GDP from 2012 to 2021 in India. There has been a significant rise in the number of patent applications being filed in India (from 56,771 patent applications filed in 2020 to 61,573 in 2021 showing an 8.5% increase).

Although patent applications filed at Indian Patent Office is constantly increasing, the share of applications filed by non-residents is quite high (Figure 2). Interestingly, the non-resident share of applications is higher in the case of patent applications only, not in the case of trademarks in India. In the year 2021, the total number of patent applications filed by Indian nationals at the Indian Patent Office is 26,267, whereas the non-resident filing number is 35,306. In the case of trademark filing in 2021, Indian nationals filed 435,580 applications and non-residents filed 52,946 applications.

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Figure 1: Increase in Patent, Trademark, Design, and GDP in India from 2012 to 2021

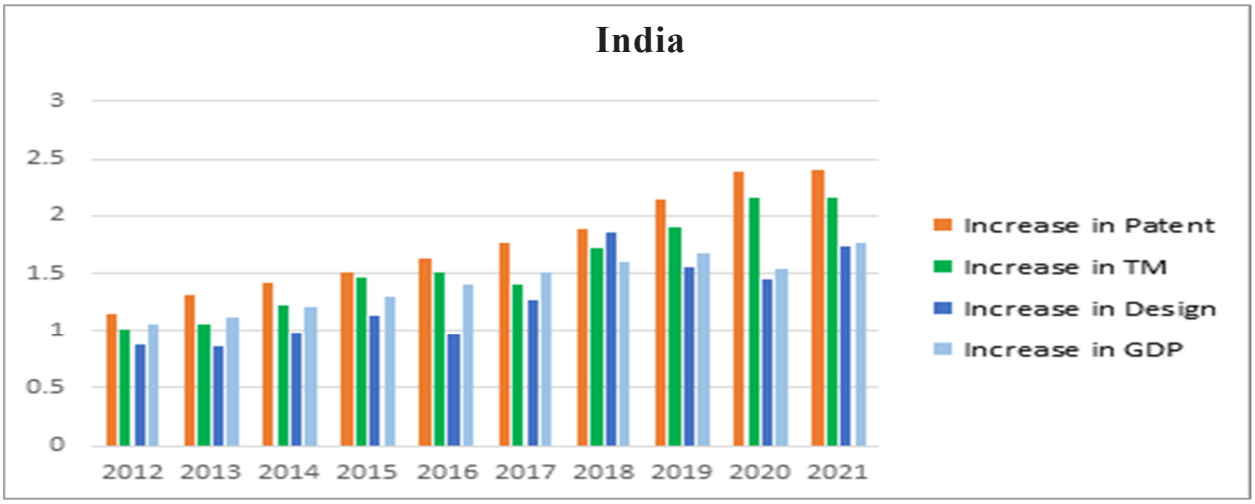
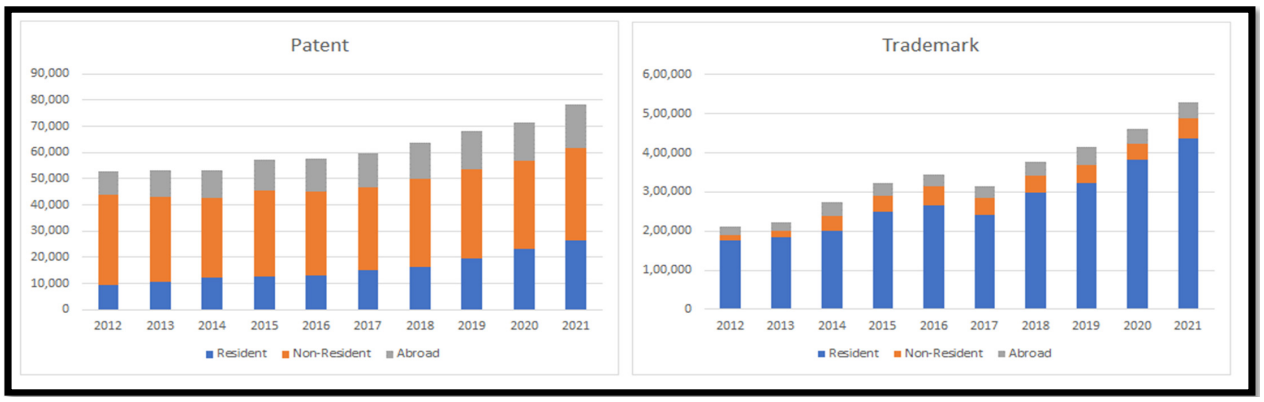


Figure 2: Resident and non-resident share of patent and trademark applications filed at Indian Patent Office



This gives rise to the question whether awareness regarding patent is not enough among Indian nationals. We also need to take into account the fact that India has a comprehensive Patent Law where sections 3 and 4 of the Indian Patents Act 1970 bring a lot of restrictions on what is a patentable subject matter in India. With the national IP policy being in place in India since 2016 and the Govt of India taking all positive steps towards making India an IP-savvy nation, it is expected that in near future, the number of resident filings of patent applications will also rise in India.

Table 1: Top 10 Patent filing Indian universities in 2020-21

Rank	Name of university	Applications filed	Applications published
1	Indian Institute of Technology (Collectively)	640	649
2	Lovely Professional University	545	507
3	Chandigarh University	416	376
4	Chandigarh Group of Colleges	352	337
5	Sanskriti University	301	197
6	Amity University	208	186
7	Teerthanker Mahaveer University	182	182
8	Galgotias University	180	28
9	SRM Institute of Science and Technology	161	168
10	GLA University, Mathura	118	127

Table-1 shows the top 10 patent filing universities in India according to the annual report of the Indian Patent Office for the year 2020-21. The number of published applications has been collected from IP India database between 1st April, 2020 to 31st March 2021. It may be noted that to encourage IP filing from academia, Govt of India has made an 80% fee reduction for patent applications for all educational institutions. Whether the institution is the government (owned), government-aided, or private, or situated in India or abroad, all educational institutions will now fall under the natural person category. There is also a circular from UGC to promote IPR in universities in India. It is estimated that about 10% of patent applications filed at the Indian Patent Office are from universities and HEIs.

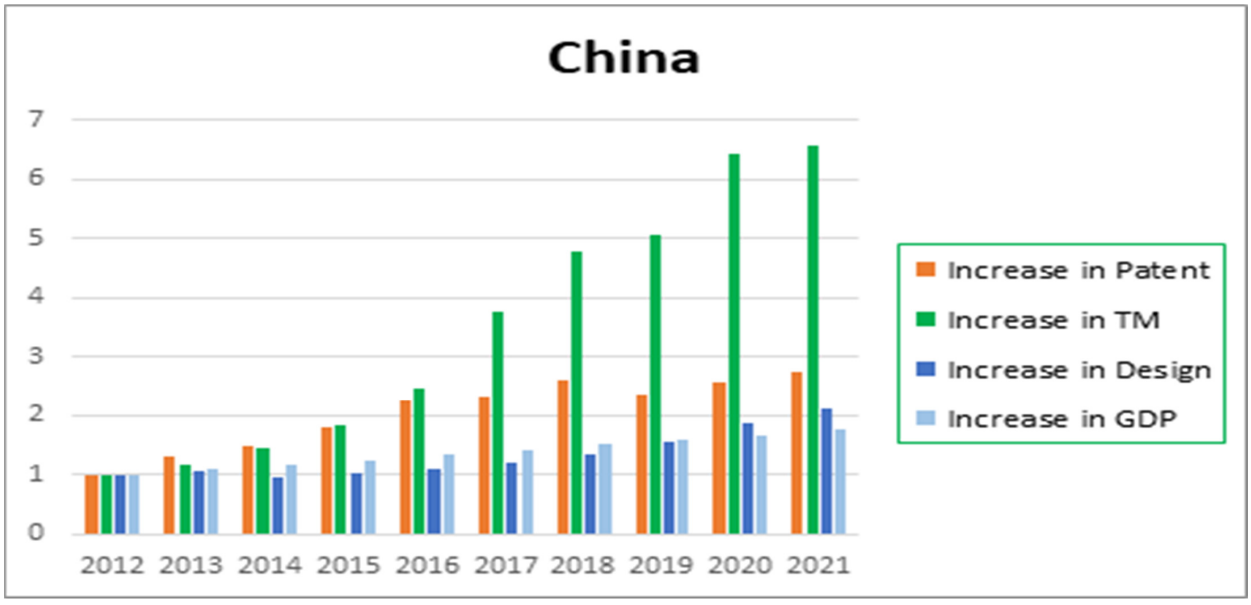
Table-2 shows the top 10 patent-filing universities under the Patent cooperation treaty (PCT) system. Among them, six universities are from Asia and four are from the US. The data is collected from World Intellectual Property Organization (WIPO, 2022).

Figure-3 shows the increase in the number of patent applications, trademark applications, design applications, and GDP from 2012 to 2021 in China. This data is taken from the statistical country profiles provided by WIPO, updated in December 2022. The filing of trademark applications started gaining momentum in 2016 in China. This might be due to the reforms in trademark registration in China planned in December 2016 at the conference on National industry, commerce, and market supervision (Watson

Table 2: Top 10 Universities under PCT in 2021

Rank	Name of University	Country	Published PCT applications in 2021
1	University of California	United States	551
2	Zhejiang University	China	306
3	Massachusetts Institute of Technology	United States	227
4	Tsinghua University	China	201
5	Leland Stanford Junior University	United States	194
6	Board of Regents of The University of Texas System	United States	177
7	South China University of Technology	China	169
8	National University of Singapore	Singapore	163
9	Suzhou University	China	153
10	University of Tokyo	Japan	150

Figure 3: Increase in Patent, Trademark, Design, and GDP in China from 2012 to 2021



& Band Law Offices, 2017). This includes starting more trademark application reception windows in the country, strengthening trademark law enforcement and efforts against infringement and counterfeiting, reducing litigation delays, etc.

In this scenario, it is essential for Higher Education Institutions (HEIs) in India to foster innovation, incubation, and entrepreneurial culture. For India to emerge as a global innovation hotspot, HEIs must create a proper sustainable innovation environment and translate research into innovation. New business endeavours and entrepreneurship should be encouraged on campus, resulting in the creation of new jobs.

Importance of Patents in NIRF Ranking of Universities

To promote IP culture in the HEIs, Govt of India has included IPR parameter in the Research and Professional Practice section (30% overall weightage) under NIRF ranking system. A total of 15 marks is allotted to IPR, giving 5 marks for patents published and 10 marks for patents granted (Ministry of Education & Govt of India, 2021). In the year 2022, 1875 institutions participated in NIRF ranking. We have grouped institutions according to their IPR scores. The formula for IPR score is IPR = IPG + IPP, where IPG = 10 * f(PG) and IPP = 5 * f(PP), where f(PG) is number of patents granted in last 3 years and f(PP) is number of patents published in last 3 years.

In general, technical institutions score better than universities. Our analysis shows that IIT Delhi, IIT Madras, and IIT Bombay obtained full marks. Table 3 shows the distribution of IPR scores obtained by all participating institutions under NIRF in 2022. As can be seen, about 92% of these institutions scored less than 1. Consequently, there is a huge need to bring proactive policy intervention and effective implementation to improve the IP culture in the HEIs of our country.

Table 3: IPR Scores of Institutions in NIRF 2022

IPR Score obtained in NIRF	Total number of institutions	Percentage of institutions
15	3	0.16%
10 <= score <15	7	0.38%
5 <= score <10	24	1.29%
1<= score < 5	110	5.92%
score < 1	1713	92.25%
Total no. of participating institutions: 1857		

Initiatives by Govt of India

Every country needs to create a delicate balance between IPR-protected individual rights and public societal rights. This can be accomplished by creating an IP ecosystem that encourages public-interest research and innovation while simultaneously ensuring fair competition in the industrial, economic, social, scientific, and technological domains.

India published its first national IP Rights (IPR) policy in 2016 to 'stimulate a dynamic, vibrant, and balanced IP rights system in India' (National Intellectual Property Rights Policy, 2016). One of the main objectives of such a policy is to create IP awareness in the country. Under the slogan of 'Creative India and Innovative India', it recommends the introduction of IP in the academic curriculum starting from the school level. Other objectives include the generation of IPR, legal framework, administration and management, commercialization of IPR, enforcement, and human capital development(Basheer & Agarwal, 2017). The policy encourages openness in innovation and puts an effort to prevent the misuse of traditional knowledge. It is worth mentioning that recently the Parliamentary Standing Committee on Commerce recommended to review the National IPR Policy in a report (Review of the Intellectual Property Rights Regime in India, 2021).

Another important initiative is the Central Government's New Education Policy (NEP) 2020. This path-breaking policy has provisions for some radical changes and aims to make India a knowledge superpower. Being one of the largest educational systems in the world, the country's higher education sector holds the key to its success. The NEP's main focus is on resource efficiency, academic flexibility, critical thinking, experiential learning, interactive classrooms, integrated pedagogy, competency-based inter/transdisciplinary approaches, and outcome-based student-centric 21st Century education. This is expected to stimulate practical learning, innovation, and an entrepreneurial culture. The government is also preparing its Science, Technology, and Innovation Policy (STIP, 2020). These policies are expected to foster an environment that encourages IP creation and innovation.

IP, Innovation, and Entrepreneurship in Academia

Creating next-generation start-ups under an academic setup is the need of the hour. The Indian government is making several attempts to bridge the gap between academia and industry through collaborative policies and actions. Premier institutions in India are making incubation centers the campus to encourage academic ententrepreneurships. Locket and Wright, in their article showed that creating academic entrepreneurship depends on the tuition's expenditure on IP protection, business development capability of its technology transfer office, and royalty distribution system(Locket and Wright, 2005).

In 2018, the Indian Ministry of Education announced the Atal Ranking of Institutions on Innovation Achievements (ARIIA), a unique annual ranking program that systematically ranks all higher education institutions in India based on their innovation achievements and campus start-up ecosystems. ARIIA focuses on innovation quality and attempts to quantify the true impact of inventions.

The Indian government has taken several steps to lead the country down the path of innovation and to foster a favourable environment. Some of the important schemes to promote IP, innovation, and entrepreneurship are

1. Start-up India, Make In India, Accelerating Growth of New India's Innovations *(AGNIi),* ASPIRE Scheme, *Uchchatar Avishkaar Yojana*, Smart City Mission, *Atal* Incubation Centre (AIC), *Atal* Innovation Mission (AIM), *Atmanirbhar Bharat,* schemes for women entrepreneurs (WEP), Several Initiatives by Ministry of MSME, scheme for facilitating Start-ups Intellectual Property Protection (SIPP) for providing facilitators to start ups for filing and processing of their applications for patents, designs and trademarks, NRDC-IPFC, TIFAC-PFCs, etc.

2. Scheme for Pedagogy and Research in IPRs for Holistic Education and Academia (SPRIHA) that establishes IPR Chair in educational institutions by DPIIT, Ministry of Commerce and Industry,

3. Women Scientist Scholarship Scheme (WOS-C) for training women having qualifications in science/engineering/medicine in the area of IPR and its management

4. Kalam Program for Intellectual Property Literacy and Awareness Campaign (KAPILA) for creating IPR awareness and protecting the IPS created by HEIs,

5. Patent Facilitation Programme (PFP) by Department of Science & Technology (DST) that established Patent Facilitation Cell (PFC) in Technology Information Forecasting and Assessment Council (TIFAC) and 24 Patent Information Centres (PICs) in various states for creating awareness and extend assistance on protecting Intellectual Property Rights (IPR) at state level

6. There are 10 WIPO Technology and Innovation Support Center (TISC) in India(WIPO, 2022).

7. Indian Patent Office conducts Patent Agent and Trademark agent exam to create competencies and capacity building in the country.

8. Indian patent office has taken several steps to encourage educational institutions in India to file patents.

9. Educational institutions are now eligible for 80% deduction in patent filing fees (Rajpal, 2021; Suneja, 2021). This initiative will help them to reduce the load of patenting cost.

These measures should help the country become a worldwide innovation and knowledge hub soon.

Case Study of Andhra University

Established in 1926, Andhra University (AU) is one of the largest universities in India. There are 6 constituent colleges within the university campus and 365 affiliated colleges spread across the territorial jurisdiction of AU.

Issues Faced by the University

Despite being a research-intensive institution, there is no adequate IP awareness among the academic and scientific community of AU. A small number of patent applications have been filed by university personnel. However, the applications are being filed on the name of the faculty, not university. In addition, the patenting costs are being borne by the faculties filing the application.

Thus, the university name does not appear in the bibliographic data associated with the IP filing in Ip India site. Since the process of getting a patent is costly and lengthy, it demotivates the faculties to take a step ahead. Most of these applications get abandoned soon as the prosecution timelines are not being met.

Steps Taken by the University

AU has been taking various measures during the last two years to create a strong IP and innovation ecosystem in its colleges and the state of Andhra Pradesh.

1. The university has established trans-disciplinary research hub to recognize talented faculties for mentoring PhD students from Andhra university.

2. To promote industrial research, innovation, and start-ups, a state-of-the-art incubation centre named a-Hub has been established. Also, state-of-the-art food, drug, and genetics testing laboratories, centre for marine resources, and innovation skill development in partnership with industry are being established. To promote innovation and entrepreneurship in the university campus, about 2 Lakh square feet incubation space is under construction.

3. The university has been sanctioned to establish an IPR Chair by the Department of Promotion of Industry & Internal Trade (DPIIT) under the Scheme for Pedagogy & Research in IPRs for Holistic Education & Academia (SPRIHA). Consequently, the university has established a Centre for IPR (CIPR) to promote IP culture and facilitate technology transfer from the university.

4. For the first time, an adequate budgetary allocation has been made for IP filing and their maintenance from the university.

5. The Government of Andhra Pradesh has designated the DPIIT-IPR Chair's CIPR, Andhra University as the State Nodal Agency for promoting and protecting IPRs in the State. The centre is involved in raising IP awareness among the academic communities and MSMEs.

6. An IP policy has been brought up by the CIPR and it is being implemented. The policy highlights several key issues in IP lifecycle i.e., IP creation, protection, filing procedure, ownership of IPs created in the university, and commercialization in addition to licensing of IPs, revenue sharing, etc.

7. To inculcate the IP culture into the academic curricula, a mandatory 2-credit course on IPR has been introduced at undergraduate and postgraduate level at the university as a skill development course. As of now, around 4500 students from the university and its affiliated colleges, from Science, Engineering, Arts and Commerce streams, have taken the course in a phased manner.

8. Recently, the university has also taken a transformative policy decision for research scholars that a publication of patent application in the official journal of Indian patent Office is equivalent to two paper publication in a Scopus-indexed peer reviewed journal. It is to be mentioned that publication of two research papers is mandatory for completing a PhD degree in the university. So, now instead of publishing a paper, the student can opt for publishing a patent application.

9. With all these efforts, the university has seen a surge of patent applications being filed by the university personnel. For the first time in the university, a patent has been commercialized. Around 50 patent applications have been filed in the last two years.

10. The IPR chair professor is being nominated in several expert committees like AICTE, IOCL, DPIIT, Indian Patent Office, etc. The chair professor has also received several awards, international invitations to speak on IPRs and recognitions, and also awards for the initiatives on IPR at the university.

It is therefore expected that soon the university will emerge as a leading IP savvy academic institution in India because of its implementation of proactive IP Policy.

Special Strategies to Increase IP Filing

Based on the best practices, the following strategies have been suggested to increase the IP filings by Indian universities.

Creating a Dedicated Centre for IPR in the University

The first and foremost step is to create a

dedicated IPR Centre in the university to raise IP awareness among the faculty and student communities and assist the university in filing, managing, and commercializing its IPs.

Developing and Implementing IP Policy

An institutional IP policy is the very foundation of IP management of the organization. It streamlines the IP management process in the university, give clear direction in IP-related issues and thereby strengthen the IP and innovation ecosystem in the university.

Introducing Mandatory IPR Skill Development Course

The university may introduce mandatory IPR credit course for all UG/PG/PhD programs. Including IPR in academic curricula will give the students better understanding of the subject and even encourage them to pursue a career in IP as the field is emerging rapidly in academia, industry, government.

Regular IP Awareness and Training Programme

This will facilitate the students and faculties of the university to have clear idea about IPR and its ever-changing landscape.

R&D Funding

IP generation capacity is directly proportional to R&D funding. The university should allot adequate funds to promising researchers/faculties and encourage them to apply for external funding.

Evaluation of Master Degree Dissertation/PhD Thesis/Sponsored or Collaborative Project Report for Identification of IP

Most of the times, the student/researcher is not aware of the potential IP created in their research works. If the research result is communicated and published in a journal, the invention loses its novelty. Most of the master degree dissertation does not even reach the publication stage. However, there can be various IPs associated with the work. Therefore, it is important to have an institutional mechanism to assess these dissertations/thesis/ project reports for potential IP by an expert before it is communicated.

Making the Invention Disclosure form (IDF) Available

An IDF is a document through which the confidential description of an invention is submitted by the inventors to the IPR cell to assess the patentability. The IDF may be made available online for students and faculties to submit details about their inventions.

University Bearing the IP Filing Cost

All fees regarding IP filing and maintenance may be borne by the university. This reduces the financial burden on the inventors.

Mandatory IP Filing for Research Scholars from Applied Sciences

The university may make it mandatory for every research scholar from applied science/ engineering department to file at least one IP application before submitting the thesis.

Cash Award for Inventors

This will encourage the student and faculty communities.

Sabbatical Leave for Faculties Starting a Venture

To encourage entrepreneurial culture in the university, sabbatical leave of 2-3 years may be given to faculties who wish to start a venture based on their IPs. If the venture is unsuccessful, the faculty may join back at the university.

Providing Support through Incubation Centre

The incubation centre can be used by faculty/ research scholar/student for their innovative venture.

Extracting old IP Statistics Data

In the absence of proper IP awareness and IP policy, the faculties generally file IP on their own name. Most of these IPs get abandoned since the faculties are unaware of the prosecution process. It is therefore important to collect all the IP filing data from the university, track their progress, and where possible take proper steps to revive them.

Changing the IP Ownership of Previously Filed Ips

As discussed, in the absence of IP awareness,

IPs are generally filed by the university faculties on their own name. The ownership can be assigned back to the university.

Making Technologies Available for Commercialization

A list of filed/granted patent technologies of the university may be prepared. If such a list is publicly available, the commercialization process will be easier.

Conclusions

The higher education institutions in India hold the key to India's way of *Atmanirbharta*. Creating a strong innovation and IPR ecosystem in the academia will help India to achieve its goal of self-reliance faster. The present study has discussed the IP culture in India, the initiatives by the Govt of India, a case study of Andhra University in creating an IPR ecosystem, and finally some strategies to increase IP filing from a university. About 92% of the universities/institutes in India underperformed in the IPR section under the NIRF ranking parameter. This result may be an eye-opener for the policy makers in India. It is of utmost importance that all academic institutions need their IP policy and IPR centre to streamline the IP generation/ filing process. The strategies suggested in this study may be helpful for academic and research institutions in India to raise IP awareness and encourage innovation among the faculty and student communities. Consequently, it will increase the number of IP applications filed by the university.

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The Rise of the Learn(s)umer

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The deeply ingrained social belief that has prevailed over time says – good education leads to a better life. Historically, in India, the existence of *Gurukuls* (learning environments led by a learned individual), has always been knowledge and experience-delivering learning centres. The objective of the Gurukul as an education system was truly simple, organic, realistic and obvious - "Plain Living and High Thinking" (Selvamani, 2019). The beneficiaries of this system have been always referred to as '*shishyas*' or learners, the students; the providers '*Gurus*' or teachers were highly respected, wise, knowledgeable, and sagacious men with a range of unmatched, sought-after skills which the shishyas hoped to learn and imbibe. This prodigious high ground ensured that the *Shishyas,* as well as the community inevitably exhibited enormous respect and trust towards their *Gurus.* The sharing of education included a vast spread, which could include life skills, values, and moralistic and ritualistic insights apart from the core skills – connecting dots across different domains with a rich set of multi-disciplinary and transdisciplinary perspectives.

Gurukuls were situated. The destination of knowledge was around the guru who would decide which student could be a part of his coterie, admitted under his tutelage and or within the precincts of his knowledge umbrella. While prior learning, social and economic backgrounds of the disciple were yardsticks and parameters for admission in his Gurukul - his discretion, whim and decision were most often final. So, the relationship was not the prerogative of the person who wished to learn, therefore unequal and different from what exists today.

Students were treated as a part of the *Guru* family. They lived and served in the gurukul. Chores were assigned. Hardship and extent of work would be the jurisdiction of the Guru and his idea of eliciting discipline. Expectations and standards were high, admonitions were ruthless and on occasion cruel. And never open to contest or discussion. The hierarchy of the relationship was patriarchal and unforgiving, yet based on affection and respect. The subservience of the shishya was an expression of complete faith, devotion and trust in the Guru.

The overall goal of education was to improve the intellectual, physical, moral, religious and spiritual aspects of learning in the *Shishyas* so that take the onus of leadership in serving and transforming society as responsible individuals and committed, upright citizen. Along with knowledge building, Gurukuls developed capabilities in all aspects of life and livelihoods, not only daily activities of farming, hunting, and gathering, but the intricacies of war and welfare, or domains of music, literature, performance arts and artisanal crafts such as well as spirituality, theology and philosophy. Gurukuls provided a complete growth plan of holistic, value-based learning experience to the *Shishyas*.

In the nineteenth century, the gurukul system was slowly eroded and replaced by a public education system introduced by the East India Company. This British education initiative eventually shrunk the number of gurukuls, and their relevance and diluted the sanctity of relationships that had been unshakeable for centuries - between *Guru* and *Shishya*. Gurus, who had been on their pedestal as the hub of knowledge and wisdom saw their disciples turn away to pursue – what was then believed as a more modern and aspirational method of learning, which would offer a credible direction to employment and career success.

Then came the Education Commissions set up by the British Raj. They defined a specific role of the Government in developing an education system that fulfills the needs of the Empire in general and local administration in specific. The objectives emphasized the need for a structure that would be achieved through primary, high school and university education. This led to the birth of public universities in Madras, Mumbai and Calcutta. These institutions like every

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other in India – are funded by the Government, from the taxation extracted in India. For the public eye, it was generous public service; for the Company, it was meant to serve the purpose of organised subjugation of local communities. Education offered was made to appear as easier accessed, within the affordable range for many, but arguably, not for all.

Economic progress and the rise in local population created further demand for many more educational ecosystems. Furthermore, the value of education was connected to higher earnings, comfortable livelihood, superior social standing, and a better lifestyle of apparent privilege. These ecosystems were becoming popular, sought after and universally recognized across every segment of society. This structure didn't discriminate in caste or religion, or social standing, there were schools of either kind for gender and cross-gender. The lack of discrimination and the option of inter-mingling made the proposition appear progressive and equitable, with rights and responsibilities shared by the school and their teachers, the students as well as the family. This unusual partnership made this learning method unique.

Post-Independence Era

In free India, the stories of education evolved – some mutated and others organic.

Since the 1960s several higher education institutions in addition to the existing few (HEIs) came into the limelight as nerve centres of knowledge. Nation-building was the mantra. We needed professionals to drive a new country to achieve the aggressive expectations of a deprived nation for almost 300 years. Different verticals of expertise were emerging as career opportunities. Dynamic, enthusiastic and vibrant new youth were riding motivated magic carpets, hoping to lead a strong India. The upswing was inevitable.

Closer to the end of the 20th century, the economy opened up to offer numerous refreshing possible professional options. The existing silos were beginning to be challenged. This favourable scenario in India fired the need for privately funded Higher Education Initiatives to come into play, scale up and introduce a bouquet of new courses aligned to the emerging career avenues. New universities focusing on new domains were where every young student wanted to be. One such was design. Close on the heels were digital technology institutions.

Industrialization and digital transformation synergised to offer these new categories with new, trendy, lucrative job opportunities for graduates. HEIs sensed this shift and one has seen an overhauling of their pedagogy and learning experiences to make graduates employable. Their objectives opened up to deliver inter, multi and transdisciplinary knowledge, develop industry-relevant skills, imbibe a positive attitude in the learners and help them find a renewed new purpose in life. Successfully conceiving and achieving these objectives was dependent on various factors - curriculum, faculty capabilities, infrastructure and the learning experience.

HEIs were making provisions for these new pedagogical resources to facilitate learning for new-age, new-gen learners. As a result, running HEIs needed significant investments in infrastructure and real estate, human capital and intellectual bandwidth, as well as a brave innovation-led mindset with an aggressive, fearless and focused approach to achieve against odds. Educational systems were beginning to evolve as engines of information transactions – delivering knowledge, developing skills, and driving discovery as an attitude of the learners. In exchange - the financial transactions and fees paid grew in size, seemingly commensurate to value earned for value spent. Of what the learning was worth and how much it would accrue when it would be deployed and committed to the industry. This construct is similar to any service-oriented business that aims to deliver its offerings to customers and earn (profits) from surplus.

In times gone by, unlike the private education providers, as part of the Gurukul system education was not weighed against money. *Gurudakhsina* (payment in cash, kind or as service for the teacher) was a respectful transaction, a gesture of thanksgiving towards *Gurus* meant for the gurukul. This practice of acknowledging value on one's own terms and capabilities was the evidence of a unique bond between the *Guru* and *Shishya.* Reverence for his guru – helped the student arrive at assumed self-worth, in lieu of which a price was assigned based on perceived value.

Gurukuls had worked on the principle of enrolment of the worthiest, survival of the fittest

and celebration of the brightest, which could mean everyone was deserving of a place in the sun. In contrast, today, educational value has a mark, a grade and then a price tag associated with it, implying that accessibility is limited and exclusive. The divide still persists, and education of quality still remains an aspiration beyond the reach of large deserving and keen sections of society.

The Rise

Education institutions and their learners can be fundamentally categorized based on two parameters – the quality of learning delivered and the cost associated with it. The first set of institutions is driven by the sole purpose of delivering academic value to the learners. They believe that consistent delivery of quality education brings success to the institutions as well as learners in all aspects. Many of these institutions are government-aided and education is incentivized, with only a minor part of the institutions operating cost derived from the nominal student fees. The major part comes from public funding. Students in such a system are expected to be truly accountable *'learners'* as their learning and fees are funded by the public exchequer. As a learner, one is inquisitive and explores new directions and possibilities. Their responsibility as graduates from such institutions is likely to be weighed against the contribution they make and how that measures up to human development as a social obligation and promise to society and the country.

The other set of institutions prioritizes the scale of the programs over academic excellence, diluting thereby, the depth of learning. They measure their performance based on the number of students enrolled in their institutions. As a result, they operate more as an industry where education gets commodified. The distribution of resources to various activities is usually uneven with frequent compromises in academic standards and requirements. Under pressure from students to justify the return on investments, such institutions are likely to present a cosmetic face and present an unreal masquerade, a charade to cloud their reality. Through the lens of these institutions, students can be viewed more as *'customers'* and less as learners and of education. As a consumer one expects things to be done at a price. And some things are achieved at any price, at any cost, by right and privilege!

A third set of institutions is emerging and they can be positioned between these two extremes. These new-age schools strive to achieve an equilibrium between the quality of learning and the quantity of learners. Achieving high standards in learning quality in modern infrastructure, tech-enabled learning resources, global professional outlook, industry collaboration and facilitated by faculty with high academic credentials. However, since these institutions are largely funded, the number of students admitted into various programs is also an important driving factor. Thus, students in such institutions are like ***'learnsumers',*** a term that conjoins a learner and a consumer, who is the customer. Such institutions try to maximize learning for learners from in-class to outside-class experiences, from theoretical understanding to practical applications, and from internal faculty to diverse external experts, all of these offerings delivered at a significant cost – for a complete ***learnsuming*** experience.

New-age careers require graduates to possess interdisciplinary skills and a positive attitude towards work. The National Education Policy Framework 2020 emphasizes on the need for developing multi and transdisciplinary knowledge and skills in the learners. HEIs are intentionally offering the power of choice-making to learners by facilitating a culture of *learnsumerism* that allows students to pursue multiple courses across disciplines at the same time. The aim to provide transdisciplinary learning is key to their success. The method of delivery for a *learnsumer* model is also a cultivated, configured and carefully calibrated ability. The use and application of knowledge are left for students to discover rather than be presented with and to them as before. *Learnsumers* enjoy this journey of exploration and evolving intention to maximize learning from various sources of their choice.

However, for 'customers' - intent and enthusiasm to seek, explore and discover new knowledge areas get diminished or diluted when the high-fee-institution offers comfort and ease of access to information, and guarantees of safety and security which in turn insulates students from challenges of the real world. The key is empowerment. A *learnsumer* needs a customer-centric, customized experience to engage – that is the hope of the new education, especially a self-financed education program.

Ed-Tech or the online education sector leveraging further such whitespaces in education through numerous bundles and formats of offerings. Machine-to-human interactions on online platforms are beginning to augment learning in classrooms. They are starting to challenge the significance of conventional education frameworks, more specifically the interaction with the teachers, learning environments, resources and learning influences outside the classroom. Moreover, while the learners maximize the value of education, they are also spoilt for choices on the numerous sources of learning which in some instances, reduces trust and reliability towards offline systems. While the very purpose of education is to build a better society, online education service providers are viewing careers for graduates as new-age value generators in hitherto unknown domains for *learnsumers* to excel.

Parents are key stakeholders in the education system. The choice of paths that *learnsumers* eventually walk on, is an outcome of various parameters associated with parents. These include parents' own understanding of career paths, awareness and outlook towards new career options and their financial capabilities. Curiousity and consideration of parents towards emerging careers is certainly high and involves many unknowns and raises several questions. The question of Return on Investment (ROI) therefore arises since there is a lack of visibility of outcomes or apparent connection with professional opportunities.

The sense of *learnsumerism* rises when there is a forced investment, forced because the value of education and the worth of professional acumen is difficult to visualize. While there prevails a perception that more money is more job security, parents tend to question the guarantee on ROI because they cannot comprehend or visualise this value. They push themselves to do the best for their children and end up paying amounts they may not see value for. When degrees are equated to products of the education system, students and parents start measuring knowledge and skill development through the monetary lens. And not as rich experiences in educational institutions that can be engines of keen learning, opportunities to drive purposes, tools to craft possibilities and spaces to imagine innovation which is all a repository of treasures for their lifetime.

Education is an action between the knowledgeable and the knowledge seeker. The transaction that educators or teachers (or the knowledgeable) conduct have always intended to effectively pass knowledge to the learners without any large expectations in return, generally, selflessly. The respect earned and fulfillment achieved in the profession of teaching has always motivated teachers to persistently deliver educational value.

Large-scale HEIs and universities that were established many decades ago have been successful in maintaining the right balance in the exchange between these two entities. However, over time, the weight of the system tends to have shifted away from these anchors. The transaction of learning appears to be shadowed by newer transactions between the learners and the management of institutions. HEIs are our insurance for the future of our world, the future of our existence. Inspired communication of educational values in the individuals of tomorrow to the students and parents, *learnsumers* is vital. It is critical to look at how educational *'products'* are communicated, marketed and delivered. Highlighting the right pulse of humanism is key to making change and change making.

The right to education is universal. The benefits of education are invaluable. The scale of impact to be achieved is immense. The nature of education is transformative. The cost of education is inevitable. A balance between academic value for the learners and financial value for the education system bearers needs to be achieved to produce *'learnsumers'* who work towards the betterment of society and contribute to nation-building.

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Action Research Fosters Excellence and Transformative Higher Education

Mercia Selva Malar*

We are what we do repeatedly. Excellence, then, is not an act but a habit. Will Durant

"Five questions on transformative education" a UNESCO article dated November 2021 states that "For education to be of high quality, it must be transformative." For the past 75 years, UNESCO has been striving to build a just, fair, inclusive, sustainable, and healthy world through education. UNESCO is of the opinion that transformative education transforms people and they in turn transform societies and build a better future for nations. Research is a part and parcel of higher education. The research adds valuable knowledge to the existing knowledge of the various domains of higher education. Action research adds knowledge and brings improvement in the areas where action research is carried out. The article examines how action research fosters excellence which influences positively transformative higher education. NEP: A transformative approach to education, claimed Tristha Ramamoorthy in her Deccan Herald article dated August 2021. The global requirement and the Indian vision is a transformative education that will build the world with collaboration, empathy, complex problem solving, and connection to other human beings and nature, along with imparting knowledge.

Hult & Lennung (1980) defined it as, "Action research simultaneously assists in practical problem-solving and expands scientific knowledge, as well as enhances the competencies of the respective actors, being performed collaboratively in an immediate situation using data feedback in a cyclical process aiming at an increased understanding of a given social situation, primarily applicable for the understanding of change processes in social systems and undertaken within a mutually acceptable ethical framework." Reason & Bradbury (2008) say, "Action research primarily arises, however, as people try to work together to address key problems in their communities or organizations – some of which involve creating positive change on a small scale and others of which affect the lives of literally millions of people."

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Review of Literature

Gawlicz, K. (2022) found that the transformation the teacher-students experienced entailed their emancipation from the teaching models imposed on them in their institutions and the development of their personal teaching theories. It was also found that action research had tremendous potential for transformation. Gibbs, et.al. (2017) examined the literature on action research. They found two areas predominantly in the literature viz. a. academic teaching practice and includes a discussion of research and pedagogy practice, and staff development, b. student engagement. They observed action research in higher education focused on investigation, reflection, and improvement of practice. Gravett (2004) demonstrated that a transformation in teaching perspective could be achieved through action research that involved inquiring and interactive teaching. He confirmed that action research is a viable means of exploring transformative learning in educational settings.

Greenwood, D. J. (2012) presented the neo-liberal and Taylorist structures affecting higher education. He placed the practice and study of action research in the context of the two structures, to explain how action research could contribute to an improved future for higher education. Grogan, M., Donaldson, J., & Simmons, J. (2007) examined the relationship between the ability to conduct action research and the quality of educational leadership. They explored the possibility to weave action research throughout the doctoral program. They found the model suitable in the case of part-time doctoral students who remained in leadership positions.

Levin, M., and Martin, A. W. (2007) examined the matter of educating action researchers in higher education. The article proved that action research need not be in the university setting alone but can

be in other settings like adult education, where participants can relate experiences, reflections, and written reflections. Price, J. N. (2001) conducted a close study of three teacher candidates' action-research studies. He showed how they used the action research framework as a springboard to develop and enhance their commitments, ideas, and practices as beginning teachers. Aas, M., Vennebo, K. F., and Halvorsen, K. A. (2020) conducted a systematic and disciplined process, a 'meta-practice' as action research, that supported changes in the principals' leadership practices, their understandings, and the conditions of their practice.

Action Research and Excellence

As the literature clearly points out action research is carried out whenever there is a challenge or problem involved, to resolve it or there is a new process/ technique/ methodology which could give better outcomes than the existing one. There is ample evidence that reiterates the fact that action research leads to excellence. Glanz J (2016) found through his action research that study participants reflected on their teaching practices and transformed their teaching. Advance Higher Education – Knowledge Hub has published numerous cases that confirm the truth that action research promotes and fosters excellence. Kurt Levin is recognized as the originator of action research. He began with his concern for the minority, to help them seek "independence, equality, and co-operation through action research and other means (Lewin, 1946).

Kilbride, C (2011) indicated in his study that participatory and democratic characteristics of Action Research are congruent with the collaborative approach required for developing a Community of Practice. The study is an exemplar of how practitioner-researchers can capture learning from changing practice, thus contributing to evidence-based healthcare with theoretical and practical knowledge. The study's findings were relevant to those developing stroke services globally but also to those interested in evidence-based practice.

It can be noticed that wherever action research has been carried out there has been improvement in the process, procedure, and outcomes. Thus, there has been the emergence of excellence. In every knowledge area and skill practiced, excellence has been a result of action research, whether it was called action research or not. Corporations across the globe provide improved products and services through action research which is aimed at the improvement and excellence of the products or services concerned. Consumer research or market research falls under the category of action research aimed to improve and excel in meeting and exceeding consumer expectations. Excellence is the result of action research that makes observations of the unacceptable situations, and behaviors of individuals and institutions and then makes amendments that will eliminate the unwanted and install the most desired. Excellence is possible only when there is an honest acceptance of the undesired and a willingness to incorporate the best. Action research thus needs honest analysis and truthful corrections. Action research becomes flawed and futile if honesty and truth are not the cornerstones of action research. Thus, excellence is founded on the core ethical characteristics of truth and honesty.

Excellence and Transformative Higher Education

Collins dictionary defines excellence as high quality, worth, merit, and distinction. It can also mean someone or something that is extremely good. How does one achieve excellence or extremely high quality in higher education? Being extremely good comes from being willing to check yourself for flaws and mistakes and correct them to become better. The self-reflection becomes empowering only with honest self-search and the truth found fully accepted and embraced. Thus, character and virtue become corner stones of excellence and transformative education. Higher education must equip its students with the attitude of embracing honesty and truthfulness. There is room for excellence and transformation only when the truth revealed is accepted and embraced. UNESCO article says, "Transformative education involves teaching and learning geared to motivate and empower happy and healthy learners to take informed decisions and actions at the individual, community and global levels."

Harvey, L., and Knight, P. T. (1996) worked on the Quality of Higher Education research project in Britain. The book examined the variety of meanings of "quality" showing that a tension has emerged between quality-as-accountability and quality-as-transformation. They found that the tension resulted in a "compliance culture" in which transformation

in students was not occurring. De Courcy, E. (2015) examined higher education literature to explore frameworks/definitions and methods to define and measure teaching excellence and to investigate the usefulness of these performance measurement tools. Bradley, S., Kirby, E., & Madriaga, M. (2015) identified a paucity of research on teacher awards based on student assessment and recommendation.

Conclusion

Vince Lombardi has rightly said, "Perfection is not attainable. But, if we chase perfection, we can catch excellence." Action research is a means to excellence as it looks for perfection and continually seeks perfection. Bryant McGill was of the opinion, "Real transformation requires real honesty. If you want to move forward – get real with self". It is important that honesty and truth are the basis for action research to bring out the excellence and transformation required of higher education. Transformative higher education should lead toward sustainable development, global citizenship, and health and well-being. Transformative higher education should lead to a just and equitable world. Action research becomes instrumental in bringing about the excellence and transformation that higher education needs critically and urgently.

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Research and Its Metrics: Impact Factor of Journals[#]

H Surya Prakash Rao*

In 2020, the University Grants Commission (UGC), New Delhi, India, has released a landmark policy document entitled *Good Academic Research Practices*. When implemented fully, the document will immensely benefit faculty, research scholars, and post-graduate and undergraduate project students enrolled in Universities, colleges, and other higher educational institutions[1]. Definitely, there will be quality enhancement in research if all the guidelines are meticulously followed. Indeed, the policy is a part of the new initiatives to overhaul the educational system[2]. Generally, society perceives that the research conducted in universities and colleges in India is of little or no relevance. The public thinks that the government funding to promote research by faculty in universities and colleges is a non-merit subsidy. Evaluating the papers published in leading journals across disciplines shows that this scenario is largely true. Linking research output with schemes for promotion lead to indulgence in malpractices wherever possible or allowed. Over the years, faculty's research has become highly repetitive, cosmetic, and sadly plagiarized. In recent years, unchecked blatant plagiarism of research work done elsewhere without proper crediting lead to deterioration of standards of research output and quality of Ph.D. Strangely, till recently, research scholars were not even taught the practices to be adopted for conducting good research. The course correction is thus required at the very beginning of research career. To stem the rut set over decades, particularly in post-independence times, the UGC, in 2019, has approved a compulsory pre-registration two-credit course known as "Research and Publication Ethics (RPE)[3]". The course is compulsory for all research scholars and is of two-credits. Successful completion of this course is mandatory for the Ph.D. registration. Indeed, this course is a part of the total number of at least 14 credits that a student needs to earn before Ph.D. registration. Apart from the RPE course, the student needs to take and clear another compulsory four-credit course entitled "Research Methodology".

The RPE course of 30 hours duration has six units focusing on research philosophy, basics of research ethics, and publication of results. One of the objectives here is to create awareness among research scholars on the ethics one should follow while publishing research output. The research scholar must exhibit integrity while identifying the research problem, its execution, interpretation of results, and publication of results. Pedagogy of the course includes classroom teaching, group discussions, and hands-on practical sessions. The course has a hands-on-experience component. Indexing, citation, databases, open-access journals, and avoiding predatory journals are a part of the practical training.

The course includes modules on Philosophy and Ethics (4 h), Scientific Conduct (4 h), Publication Ethics (7 h), Open Access 4 Publishing (4 h), Publication Misconduct (4 h), Databases & Research Metrics (7 h). The module on Databases & Research Metrics has two sub-units; one on Databases (4 h) and the other on Research Metrics (3 h). The sub-unit Research Metrics includes three hours of teaching and hands-on training on several topics. Topics include "Impact Factor of Journals as per journal citation report, Source Normalized Impact per Paper (SNIP), SCImago Journal Rank (SJR), Impact per Publication (IPP), and Cite Score". Furthermore, the course includes topics on metrics like "h-index, g-index, i10 index, and almetrics to evaluate the impact of the journals and individuals".

Every researcher should ask the question, "Why to publish and where to publish?". Researchers in higher educational institutions generally publish articles/ papers in the public domain. Such articles facilitate the peers to understand the new knowledge generated from the researcher's research work. The articles delineate the advancement of knowledge in the selected areas/ fields. The publication also places the work in right perspective so that peers may take up further research on the topic. Professor White of Harvard University states that publication is a natural consequence of research. If the work is not published, then why do it in the first place, he asks[4]. He states that writing a research article should be an integral part of the work itself, not a different activity. The focus of research should be on gathering the information required for the publication of the work. Researchers publish articles in journals devoted to research field, meant for enlightened readers, and not intended for the public. On the other hand, the public gets to know of knowledge advancements through popular media like magazines, radio, T.V., and newspapers, most often written in the

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journalistic language. Before publication, editors of the journals send the manuscript for peer review. Peers, in turn, bring their perspective on the research work done and suggest improvements and corrections be made so that the readers will get appropriate and accurate information.

Traditionally, journals were printed and circulated among researchers for reading and utilization of the knowledge. There were no publication charges. Readers, on the other hand, pay to sustain the journal and the publishing house. However, in recent years, due to massive advancement of information and communication technology (ICT), online journals have proliferated. Consequently, print versions of journals have almost disappeared. Number of journals and papers that appear in the journals in each field of research nowadays is enormous. It has become impossible for researchers to go through all the journals in their field of study to perform a literature survey.

To facilitate researchers, leading publishing houses pull out indicative contents of the journal papers and place them in their databases for ready reference. The databases have information on the paper indictors like title, year of publication, volume, page numbers, abstract, keywords, etc. Science Citation Index (SCI) of Web of Science (WOS), and Scopus of Elsevier's Abstract and Citation Service are the most comprehensive and reliable databases. Researchers, however, have to pay to access them. Besides these two giant publishing houses, Google Scholar and Microsoft Academic provide vital and information on the title, abstract, year of publication, the journal's volume, page numbers, and links. The information however, is cluttered. Although above free-to-use resources are beneficial, no filtration occurs at the source, and hence the reader has to navigate to get useful information. In India, abstracting service like J-Gate is popular, but the database is not exhaustive. In addition to the above, UGC in collaboration with the University of Pune, maintains a list of standard and non-predatory journals called CARE Journals (Care is an acronym for Consortium for Academic and Research Ethics). The CARE list includes all the journals abstracted in Scopus and SCI databases. Besides some standard journals, Care list includes the journals related to Indian culture and milieu. Generally, Scopus and SCI databases do not abstract papers from India specific journals.

The question that confronts any researcher is "how good is the journal and how to assess?[5]" The earliest answer to this question on Research Metrics was Journal Impact Factor (JIF). In the recent past, many modifications of the JIF made it more accurate and correct.

Journal Impact Factor (JIF)

To put it simply, the JIF of a journal is the impact it makes on its readers. E. E. Garfield (1925-2017), the famous bibliographer, is originator of the JIF. He introduced JIF while working at the Institute for Scientific Information (ISI), the Science Division of the Thomson Reuters, a leading publishing house. He introduced the metrics like Citation Index for the authors and JIF for the journal. Even today, despite many deficiencies, JIF is a barometer for the reputation of a journal. Most researchers accept JIF as a fair indicator for how good a journal was in a given year. In a way, JIF is quantification of the importance of the journal.

The JIF in a year is calculated based on the citation of the papers published in the journal in any WoS indexed journals of the previous two consecutive years. For example, the JIF for a given journal in 2019 is worked out as follows. Let **A** be the number of times the articles published in 2017 and 2018 have been cited by WoS indexed journals during 2019, and B be the total number of papers/articles published in 2017 and 2018 in the journal. Then IF for 2019 for the journal = A/B.

Although JIF is famous and used extensively by researchers all over the world, it has many limitations. P. O. Seglen, working at Institute for Studies in Higher Education, Oslo, Norway, pointed out several deficiencies in JIF[6]. The JIF reflects the importance or lack of it for all the articles taken together. That is, JIF does not reflect the relevance of individual articles. Moreover, journals that publish review articles garner more citations. Self-citations of the articles are not corrected while calculating IF. Generally, authors look to publish in journals that specialize in their chosen fields but not generic journals. Consequently, generic journals may lose in citations. Lengthy articles have more citations and thus tend to increase citations of the journal which specialize publication of such articles. The JIF released by Thomson Reuters has English language bias. Hence, articles written in English and published in journals published in the English language get more citations. In corollary, journals that publish articles written in non-English languages get lower IF. Since the USA and U.K. use only English as a medium of communication, journals published from these countries tend to have higher IF. The number of

citations in some fields such as Mathematics is low. Consequently, IF of the journals that specialize in Mathematics have lower JIF. Since most of the papers in Mathematics are individually written, number of papers is also low. On the other hand, citations in some fields like Life Sciences tend to be large, and hence IF of journals that publish papers in Life Science tend to be higher. Finally, citations given in books and monographs are not taken into account while calculating JIF. Hence, such authors lose in citation count. Ankur V. Desai, from the Department of Conservative Dentistry, Vaidik Dental College and Research Centre, Daman, India, also came out with similar observations[7]. Although useful, the IF does not address many issues about the journal's reach out to its intended readers.

To address several issues with IF as listed above, the Web of Science (WoS), now managed by Clarivate Incorporation, USA, and its competitor, SCOPUS by Elsevier came out Journal Citation Reports (JCR) and Cite Score, respectively.

Journal Citation Reports (JCR)

Web of Science (WoS) introduced Journal Citation Reports (JCR) in 2010[8]. It is an annual free-publication; released each mid-year. It gives a ranking for journals in the areas of science, technology, and social sciences. The WoS collates information on twenty-eight evaluation criteria from its database. Citation and Article Count, Impact factor, Immediacy Index, Cited half-life, Citing Half-life, Source data listing, Citing journal listing, Subject categories, and Publisher Information are among them. The data is analyzed and published as JCR. Within JCR, one can search by journal title or by subject. The output is downloadable and storable. The information, however, is limited to the citation data of the journals indexed in WoS. Though WoS indexes over 12,170 journals and conference proceedings in arts, humanities, sciences, and social sciences published from 83 countries, it does not cover many more. Indeed, the database is highly selective and does not include many reputed journals, particularly new ones and those that fall in the interdisciplinary areas. For example, journals on spirituality or those from vernacular languages do not find a place in WoS. The WoS database currently covers 9,370 Science, 3,486 Social Science, 7,487 hybrid, and 1,658 Open Access journals. The WoS is known for rigorous quality control. For example, it suppressed information from 33 journals in 2020 due to evidence of excessive self-citation or citation stacking. However, WoS is attempting to increase its reach every year while keeping up quality. For example, it added 351 journals in 2020. Over 9000 institutions worldwide subscribe the database. The academic community generally perceives that the WoS covers only the standard journals. Conversely, non-WoS journals are of lower quality.

Although very famous and respected, the JCR has some issues. For example, JCR does not normalize citations; hence, it does not truly reflect importance of a journal. Indeed, it is best to compare one journal with another in the same category. To determine the IF of a particular journal, one should select a JCR edition (Science/Social Science), year, and categories, seen on the left of the screen in Clarivate Incorporation's website. One can scroll the list to find the required journal.

The Output of JCR includes (i) the average number of article citations in the year of publication, (ii) impact of the journal without self-citations in the same journal, (iii) half-Life of the citations in the journal, (iv) the half-life of the articles published in the journal, and (v) Eigenfactor Score.

Eigenfactor scores for the journal measures journal's prestige (its usage). The concept of Eigenfactor was introduced in 2007 by Professors Carl Bergstrom and Jevin West from the University of Washington[9]. The value reflects how frequently an average researcher would access content from that journal. Eignenfactor scores, which are free, can be accessed in the JCR or at eigenfactor.org. Presently Eigenfactor is restricted to Science-based WoS journals. It endeavours to map journals' influence per published article over the previous five years. In a way, Eignefactor is an extended version of JIF. The Eigenfactor score is scaled such that the sum of all journals covered is 100. The journal is given its share in the score as a percentage contribution amongst all the indexed journals. For example, "Nature" has a score of about 2.0, which incidentally is the highest among all the scientific journals. In a way, the score shows that 2% of all citations (excluding self-citations) are from Nature, and this journal has the most significant influence, prestige, and quality.

The web site *eigenfactor.org* also provides data on Article Influence Score (AIS). This information is a measure of the influence, per article, of the papers published in a journal. Divison of the Eigenfactor by the number of articles published in the journal gives the score. The mean Article Influence Score is 1.00. An Article Influence Score greater than 1.00 indicates that the articles in the journal have an above-average influence.

Disadvantages of Eigenfactor/Article Influence Score include (i) restricted to science subjects, (ii) each journal is assigned to a single category, even though the journal may have published articles from several interdisciplinary areas. Comparison of articles in different fields of research is challenging.

Scimago Journal Rank (SJR) and Source Normalized Impact per Paper (SNIP)

As an alternative to the JIF of WoS, in 2010, Elsevier introduced a new journal ranking system by utilizing vast data accrued from inception[10]. Elsevier endorsed the journal ranking system called 'Scimago Journal Rank' (SJR) developed by SCImago Research Group headed by Professor Felix de Moya in Spain, and 'Source Normalized Impact per Paper' (SNIP) developed by Professor Anthony van Raan and Professor Henk F. Moedand in the Netherlands[11]. Both the groups were working in partnership with Elsevier, a journal-publishing house with a global reach. The SJR and SNIP metrics are calculated by using the Elsevier database and are displayed in SCOPUS. Unlike JIF of WoS, which considers two years for calculating the impact of a journal, SJR and SNIP consider three years, thereby increasing the impact evaluation's accuracy.

While the IF introduced by WoS treated all journals and papers as equal, which they are not, SJR considers the journal rank (prestige) in calculating the impact that an article makes. A journal, which may have lower citations but belongs to a higher rank is also considered. Thus, SJR makes a distinction between popularity and prestige.

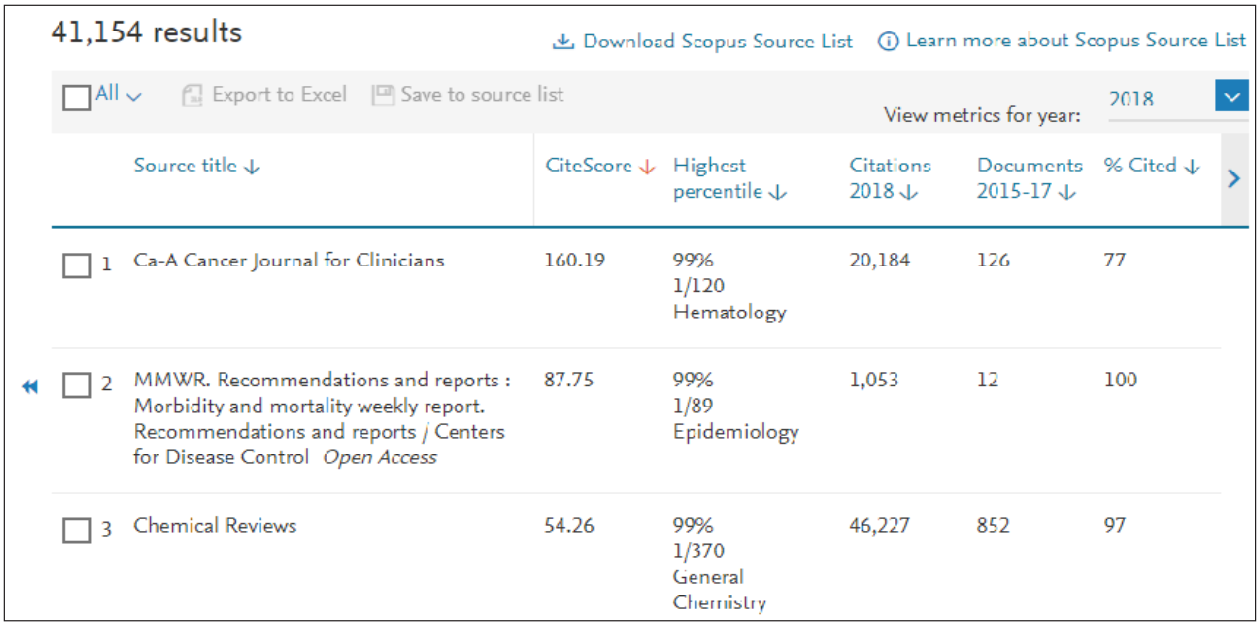
Source Normalized Impact per Paper (SNIP) is a method developed for topicality corrections: citation potential between journals catering to different subjects. It measures contextual citation impact by weighting citations based on the total number of citations in a subject field[12]. It is a ratio of the journal citation impact to that of the topicality of the subject field. The impact of a citation is given higher value in subject areas where citations are less likely. For example, citations in the journals that cater to the individual-oriented research field like Mathematics are low; however, importance could be high, in contrast to life-science-oriented journals. Citations in life-science-oriented journals are high, and the research is mostly a collaborative effort. SNIP corrects such differences in citation patterns through normalization at the source. Unlike the well-known JIF, SNIP corrects differences in citation practices between scientific fields. Thus it allows a more accurate comparison of citation impact between different fields.

The SCImago Journal and Country Rank portal is a free online resource. In addition to journal and article impact, the portal provides journal rankings by country of origin. Furthermore, the site also provides visual representations of the data.

Comparison between JCR and SNIP

The significant differences between the indicators

Figure 1: CiteScore 2018 Results Downloaded from SCOPUS Source Maintained by Elsevier *(https://www.scopus.com/sources)*



provided by the IPP and SNIP and the JIF are summarized below:

- Scopus gives IPP and SNIP, whereas WoS gives JIF.
- SNIP does corrections in different fields, and JIF does not.
- IPP and SNIP are for three years, and JIF is for two years.

CiteScore

CiteScore is a recent addition to Elsevier's journal metrics and available for free on the Scopus site. It includes data on SNIP, SJR, citation count, percentage of citation, and document count[13]. The score provides insight into the citation impact of over 22,220 journals indexed in Scopus. The method offers the most accurate indication of a journal's impact.

The method for calculating Citescore is by calculating the citations' ratio from all documents in the year to all documents published in the prior three years. For example, to calculate the 2015 CiteScore, consider the citations in 2015 for the documents published in 2012, 2013, and 2014—(A). Divide this number by the number of documents published in 2012, 2013, and 2014—(B). Then CiteScore = A/B.

The calculation of CiteScore is straightforward with no secret algorithms or hidden details. Advantages of CiteScore include (i) three-year citation window, (ii) CiteScore's numerator and denominator include all document types, (iii) CiteScore is essentially the average citations per document that a journal received over three years. (iv) Done annually, with built-in monthly impact.

The page downloaded from the CiteScore site[14] for 2018 is given in Figure 1. The figure shows that *Cancer Journal for Clinicians* has a cite score of 160 and is the most popular journal in its field. More papers in the sub-field Hematology have been cited more than in any other sub-field during the previous three years, between 2015-2017. The total number of citations for the journal in 2018 was 20,184, and the journal published 126 papers during 2015-2017. Out of those 126 papers, 97 papers (77%) attracted citations.

Conclusion

Both Journal Citation Reports and CiteScore provide scientific analysis of the impact, importance, and relevance of the journals and the individual papers. There are many more issues yet to be addressed for the quality enhancement of these analyses and metrics. For example, taking two/three of publishing for calculation is arbitrary. The citation itself is more or less a prerogative of the researcher. Some researchers deliberately do not cite relevant articles and get away when their article passes through referees. Malpractices like targeted citation, group citation, and non-citation are prevalent. Researchers also should be aware of dubious impact factors declared by the predatory journals. Such issues, one hopes, will be addressed to make impact analysis more accurate.

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Role of Universities and Colleges in Entrepreneurship Education

B M Naik*

What drives entrepreneurship in knowledge-based economy is the research, innovation & start-ups. Resources for research, innovation and start-ups are the most important instruments today. If they are not provided future generations will not pardon us.

Young graduates today leave institutes with their minds set on becoming well-paid employees. Their role models are the big managers, and CEOs, instead of entrepreneurs like Narayan Murthy, and Elon Musk. Lucrative opportunities due to a lack of entrepreneurs are either dying or being taken away by foreigners. Our engineers are working for foreign masters, as humble servants. Universities ought to educate youths to become captains to capitalize on emerging technology giving *Technology Push matching with Market Pull. The industry today is technology driven.* The present frame of universities without innovation centres and start-ups is not competitive enough to produce entrepreneurs of world-class standards. *They are producing good soldiers, who are necessary but not enough.* Indian entrepreneurs today in the international market are very few, it is because in the past we were not teaching them to become so. Now in globalization and liberalization Indian youths aspire to make a mark in the international market. So as to enable young graduates to become global players in entrepreneurship, universities and colleges are called upon to educate students in foreign. For example, MIT Boston has six full professors in entrepreneurship, to do promotion, teaching, and research. Various aspects of education are discussed in this paper. The paper presents, in brief, the need and importance of educating youths in entrepreneurship development in universities and colleges so as to enable them to win in the competitive world. Conclusions are drawn so as to generate more enterprising graduates to harvest vast opportunities. The role of universities and colleges is critical in entrepreneurship education, which means when not done entrepreneurship will suffer a serious setback, India then may remain a developing country with 20% of people living below the poverty line.

On one hand, it is observed that there is so much unemployment and underemployment amongst educated youths and on the other hand, there is a shortage of entrepreneurs to develop innovative enterprises. There is an abundance of natural resources on one hand and a shortage of finished goods and services on the other. There is an influx of goods and services from east-west countries in the Indian market. Indian industry and SMEs are far too behind the world, they stand as low as 48th in the world ranking. This is because the human workforce in India is far too less enterprising. It is the bounden duty of universities & colleges to educate youths in entrepreneurship competitive by world standards.

The key factor behind the lack of entrepreneurship is the insufficiency of research, the insufficiency of innovation and the insufficiency of start-ups. The lack of Research & Innovation education in universities & colleges lies at the roots of the insufficiency of entrepreneurship. As a result, education is going in one way and opportunities are going in another way. Thousands of youths in search of enterprising education are migrating to developed countries. In the year 2021-2022 students going abroad have increased by19%.

Innovation is a Strong Stimulant for Entrepreneurship

Persons with innovation skills in India are in short supply. This is the major barrier to entrepreneurship. The paper suggests that research skills, innovation skills and entrepreneurship skills must be included in the teaching of curriculum in universities & colleges. Enabling students to learn innovation in colleges and universities is the only way at this juncture of time to accelerate entrepreneurship. It is found that students who learn innovation at a young age, become far more enterprising and remain

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enterprising throughout life. Universities have become key players in entrepreneurship systems. The ability of countries to grow and prosper now depends critically on the ability of universities and the university system. This new role of universities is to be understood to keep pace with changing technology, avoid obsolescence, and keep the workforce competent by global standards. India is too slow to understand and adapt to this new role of innovation & entrepreneurship. Universities should not now be confined to national boundaries but they ought to go much beyond far and wide. This is the need in a globalised world. Also, how universities organize their linkages with industry and society, local as well as international has assumed great importance.

Entrepreneurship Needs Innovative Persons

It is observed that innovative and enterprising persons never remain idle or jobless. They are always in demand. Professors in India have high capacities to teach innovation & entrepreneurship but they need to be oriented and trained. Syllabi need to be revised to remove the deficiency of innovativeness. Universities have to depart from traditional methods and contents of teaching. This is not easy. The mindset of professors and the mindset of university administration ought to be changed. Because of the fast obsolescence of technologies Job contents in vocations & professions are changing very fast. Enterprising persons are observed to be quick to adopt and lead in ever-emerging new situations.

The jobs of today won't be the jobs of the future. Jobless growth can happen

The people need to be trained, again and again, lifelong so as to retain them on the job and avoid joblessness. The people have to exert to shift from low-productivity jobs to higher-productivity jobs. Immediate challenges under globalization pressures are therefore to make college education job oriented and enterprising, and offer continuing education courses lifelong for service personnel. Not only have machines become obsolete but men also. The competency of men and women depends on their learning and relearning rates. The challenge before university is to make learning joyful, innovative and enterprising.

The government is giving slogans at election time to provide jobs to all. This is welcome. But is this possible without enterprises and competent entrepreneurs, without cooperation from universities? The vision of the university should include Entrepreneurship skill-oriented education. The present methods adopted in becoming entrepreneurs are improper and divorced from what is the need of time. It is a good sign that higher education in India is growing. But innovation and entrepreneurship skills for commercial exploitation of new technologies, which is the demand of time are lagging.

How to produce more entrepreneurs, and how to improve the skill set of the workforce for entrepreneurs and intrapreneurs on continuing basis should be the main vision and mission of universities

A beginning is made in India by the Modi government in this direction. Start-ups are coming up more in number. Hackathon meets are organised. National Innovation Board is set up. This is good. But, most of the start-ups today are in the area of well-established or sunset technologies, and far too less in sunrise i.e. New Technology Based Firms {NTBF]. First Mover entrepreneurs are almost absent. This is because of the lack of adequate research and innovation in universities & colleges, which provides a foundation for entrepreneurship and spin-off i.e. NTBFs. India has to go a long way to properly address entrepreneurship education. The problem is too big and reforms are far too inadequate. Research skills, Innovation skills and Entrepreneurship skills need to be taught in universities & colleges. It can undoubtedly provide a sustainable long-lasting solution.

A question is often asked what is the cost of not adequately educating students in innovation and entrepreneurship? Who pays? The cost is far too big, so big that the whole country remains poor in the developing category, with 20% of people living below the poverty line. There remains a shortage of hi-tech entrepreneurs, with many youths jobless and underpaid. Besides, increased crime rate, corruption, poverty, robbery and many other undesirable things.

The Poverty of Knowledge Leads to Economic Poverty

World experience tells us that the vast bulk of job growth comes from advances in new knowledge & new technology, rather than resources like land,

labour and capital [Robert Solow Nobel Laurate]. India so as to promote entreprising culture ought to focus its attention on technological innovation, research and entrepreneurship in universities. An increase in the state budget for research and innovation is strongly recommended, by many commissions and committees, in the past, but they remain on paper. Research funding is far too less, of the order of only 0.8% of GDP whereas in developed countries it is around 5%. Not investing adequately in innovation in universities & colleges is a step towards obstructing the growth of the enterprising culture.

When shall India realise the importance of research & innovation, which is seed corn for benefits? According to a study as many youths are unemployed in India so many jobs are awaiting able men and women with the requisite skills & knowledge. Today opportunities for entrepreneurship are growing in one direction and our education is growing in another, resulting in a mismatch. Consequently, thousands of dissatisfied students are going abroad, paying huge sums of money, a huge brain drain and money drain. Indian universities in the absence of innovation infrastructure have become mediocre, they are not counted in the world. The cost to the nation is very heavy. it is the students, the young generation who have to pay by foregoing opportunities in life. India should have to put conscious efforts to create a culture of entrepreneurship.

India Government ought to give top priority in the national budget to universities in funding education for entrepreneurship development, International Aid giving organizations like the world bank, UNESCO, Asian Development Bank etc. ought now to provide much more aid to universities so as to develop a new culture of entrepreneurship and innovativeness. Well-known saying goes, if you want to feed a hungry man, do not give him fish, instead teach him how to catch fish.

What is Innovation? Invention when exploited commercially is known as innovation. Innovation converts invention into money. Research conducted in universities in Indian universities rarely results in commercial exploitation. Today thesis written mostly is bookish, not relevant and useful to the industry. They remain on the library shelf. No conscious effort is made to obtain economic value from them. Students do not get the opportunity to learn to convert inventions into usable goods and services. This reduces the relevance & utility of research done so also a financial return on investment. It is a good sign that higher education in India is increasing but innovation and acquisition of skills for commercial exploitation, which is the demand of time, is lagging

New Visions of a New World Needed. Do the Indian universities & colleges possess global visions & missions to generate new knowledge and new technology**?** Have they nurtured culture to produce new technologies? Visions are in short supply and not the resources. The potential of students & professors in Indian universities is high, but unexplored, & wasted. It is observed that many CEOs of world-famous companies like Microsoft, and IBM are Indians. Many Indians went abroad for studies, did master & doctorate there, served there for many years and then they rose to CEO positions. India needs to acquire new visions of a new world from world-class institutions to acquire enterprising culture.

Experience of Developed Countries

Stanford University of USA has given birth to as many as 3000 hi-tech start-ups, New Technology Based Firms [NTBFs] employing millions of educated men and women, each earning high income. University gets a royalty, millions of dollars each year from these companies which are ploughed back into research to create furthermore companies and in turn enterpreneurs & intrapreneurs & hi-tech jobs. Universities in other developed countries like Germany, France, Australia, and China. Singapore and New Zealand are not behind. Universities in developed countries actively engage themselves in high-end research, innovation and entrepreneurship. They obtain patents and royalties on commercialised patents. For example in mobiles, the material cost of a mobile is hard Rs 500 and the rest in thousands is a royalty paid for patents used in mobile.

The birth and perpetual success of Silicon valley are attributed to Technopreneurs., who draw continuous support, inspiration and technological ideas from research conducted at the university. Silicon Valley has progressed not because they are wealthy entrepreneurs but because they are technopreneurs. The industry today is more Technology driven. A new phenomenon is observed, the world over, that hi-tech industries especially research based are flocking around advanced

research & innovation centres in universities. This is to obtain brand new ideas, providing plentiful hi-tech, hi-pay jobs, in turn creating downstream many more low-end jobs. Do universities in India have such a vision and mission to give birth to companies? Do they engage in high-end research? Have they installed innovation infrastructure? Why they do not yet have when universities abroad have for many years, and by virtue of them the society has become enterprising? Indians have high capabilities but due to shortcomings in university research and innovation, they remain unfolded. Universities in India do not have a global vision, no strategic management and planning, and no benchmarking with the world's best counterparts. That is the main reason for low entrepreneurship among graduates, and consequently, the enterprising culture is weak, India remains a less developed country, in spite of its high potential. This is to say that people are good but systems are not.

MIT Boston Experience

MIT is an innovative and enterprising world-ranking university. It has so far spun - off thousands of entrepreneurs like at Stanford. I have personally visited this institute. It has an Entrepreneurship Department having six full professors teaching, promoting and researching entrepreneurship. It has a technology licencing office selling patents and IPR to industries. It has yet a centre donated by Dr Gururaj Deshpande. MIT every month organises a face-to-face meeting for both innovators on one side and entrepreneurs on the other. I did attend one of the meetings. It is a very fruitful meeting. The discussions of MIT and similar discussions of other universities are broadcast on TV every day. Entrepreneurs suggest many of their viewpoints, market needs to innovators. This dialogue leads to continuous upgradation of technology in NTBFs. MIT has its own Venture Capital Firm for giving financial support to its start-ups. When these start-ups become big and earn profit they pay royalties to MIT, which is further ploughed back in research and innovation, giving a boost to entrepreneurship & employment.

Chinese universities are now giving birth to 100 NTBFs every year. Australian universities are giving birth to 50 start-ups, NTBFs. India ought to adopt this model for their universities for developing entrepreneurship. They have to envision to make the industry win.

Medical and Related Sciences Research Park in Toronto University, (Canada)

The unique feature of this Research Park is that it is housed in 17 big tall buildings in down town of Toronto. There are many research-based companies in this park, employing more than 6000 PhD degree holders. MaRS was started by prof Evans 50 years back, in one building. It did good work and expanded itself into 17 buildings. For expansion, MaRS purchased nearby properties downtown at market price and built buildings as per their own requirement. Researchers in this park give lectures to students at the university, and they use research ideas and experiences at the university for furthering their work in the company. MaRS provides an innovative infrastructure for research and learning. It is providing extension services to institutions & universities in many foreign countries like in India. There are 17 Research Parks like this in seventeen universities in Canada. It is on account of such innovative structural reformations that Canada has enterprising culture in society and a very small unemployment rate. India ought to emulate this model. It will undoubtedly win.

Innovative universities give new ideas to leaders to help the industry win. Indian universities ought to become Light House for the industry.

Cambridge Research Park, Limerick University Research Park, almost every university has a Research Park in USA, Canada, Germany. They have been established especially in 84 technical universities in Germany, 125 research universities in USA, and 17 universities in Canada. Technology-based spin-offs from Sophia Antipolis in France, Oulu business park in Finland, etc. are some famous examples. They are found to be successful in bringing about regional innovation and growth at a fast pace. Research Park is a proven model in developed countries. for high-tech industries. They have become a magnet. India must jump-start and adopt them forthwith. The author has personally visited many of them. MIT Boston is earning more than 100 patents every year, which are sold to the industry, earning about 20% of its budget. Joblessness in India is increasing due mainly to a lack of innovation. This is the key factor behind growing unemployment. So as to generate more employment in India we must have to start Research Park in each university. Association of University Related Research Park (AURP) in USA conducts

courses of 2-3 week duration. Our key persons need to attend, to installation successfully.

New Technology Based Firms (NTBF) started by entrepreneurs in university-related research parks are found to be globally competitive. The success rate is very high. Universities can provide a powerful engine to launch NTBF and generate hi-tech, high-income employment. On the downstream side, it is followed by low-skill jobs many more times. Evaluation reports by the Association of University-Related Research Parks done in USA clearly indicate that this is the only way to make a region innovative. Universities in India should not close their eyes towards such innovative infrastructure and adopt them without any delay. The expenditure on these centres is not unproductive but most productive. A beginning is made at IIT Mumbai, IIT Chennai, etc. but the progress is too slow.

What we observe differences in universities abroad is that research-based companies are flocking around the university in search of the latest knowledge and latest technology. Almost every university has a Research Park, in which these companies take space on rent and operate. Students work in these companies on vacations. Research entrepreneurs teach in universities. This makes the exchange of innovators and students' professors easily possible. Universities spin off the companies, set up by professors and students. Venture capital companies have opened offices on campuses for funding and early commercialization of brand-new technologies. Universities have become sources of new ideas enabling companies to win. They have become maternity homes for start-ups, where good baby care, without any congenital defects, is taken. Universities function like a lighthouse for the growth and prosperity of the industry. Benchmarking with these world's best universities is strongly recommended, for they generate hi-tech, high pay jobs, which youth are looking for. You need a swimming pool to learn to swim.

What are the things which foreign universities teach, but we do not? Unless we teach students skills of innovation, skills of a generation of new technologies, skills of discovery of new knowledge, patents & IPR our culture will remain weak in entrepreneurship. The present Vector direction of Indian universities and colleges needs resetting. We need to correct it by benchmarking with the world's best universities. There exists a big Gap between Indian education on the one hand and entrepreneurship and employment needs on the other, mismatch exists because university courses are diverted from market needs. Universities must have to do a mapping of the job market. Gaps will have to be bridged, by designing job-oriented innovative courses.

Gap Analysis between Indian and foreign universities Why do students go to universities in foreign? Because foreign universities are innovative in character, our universities are conservative. Foreign universities operate today as if the future has arrived, we exist today as we existed in past. They teach sunrise knowledge, we teach sunset. They produce leaders, we produce followers. They lead a change we follow the change. They are engines of change, we remain bogies. They are not afraid of change as we are. They practice creative destruction and weed out old. Their labs are creative in nature, always innovating, and discovering. Our labs mostly are testing to understand known theories and technologies**.** The challenge is how to bridge the innovation gap. without which entrepreneurship cannot succeed.

Characteristics of Innovative and Enterprising Persons: We must remember that those who learn innovation at the student age remain innovative and enterprising lifelong and are never jobless. They develop a passion for innovation which gives them extra energy to create jobs. World experience tells us that more Innovative nations are found to take away jobs from less innovative. Developed countries are taking away jobs from less developed. Retraining of men and women lifelong, fitting to ever-emerging new knowledge and new technology has become essential. So as to remain employed in a competitive globalised world *It is now necessary to build a Learning society consisting of learning organizations and learning individuals.* The proportion of mid-career students in US universities is much higher. *Can our universities not play these roles effectively?* The challenge is how to make universities enterprising and world ranking.

Innovators are successful entrepreneurs and hence are indispensable Technological innovation,

organizational innovation, financial innovation, business innovation, and social innovation like in India by Dr Ambedkar, Mahatma Phule is an essential precondition for growth, maintaining employment and competitiveness. An innovative person has a mission in life, He has a passion for public well-being, and this passion gives him purpose, and extra energy to pursue reformation. He consistently strives to improve. He is always dissatisfied with the prevalent. He wants to create new and again new. Innovation and entrepreneurship are progressing constantly on the efforts of new ideas from such creative persons. Can our universities adopt the character of innovation and produce such innovative, enterprising graduates in number?

Innovators matter most

Ideas are the real capital. New ideas are needed to succeed. They come only from innovation and not without. Idea generated is opportunity generated, giving birth to many more opportunities. Institutions are the legitimate places, the crucibles for experimentation, for the manufacture of ideas. Institutions in the knowledge economy have no reason to exist if they do not generate new knowledge and new ideas. Institutions are the places to create dreams and to create capacity and imagination in youths to implement them. This new role is evolving in universities of the modern world, which is at the base of entrepreneurship. The competency of the workforce is measured today in terms of its ability to innovate. People have to be innovative to see ahead of other's incoming opportunities. This is the key to increasing competitiveness is to be understood.

India possesses the largest pool of youthful workforce and high-quality human capital. This is a competitive advantage. India needs to prepare such people globally competitive, make them enterprising by global standards for global needs—

Commercial Exploitation of Brand New Technology Importance of NTBF

Universities and colleges are the legitimate places where new knowledge and new technologies could best be generated and simultaneously released to the young generation for their commercial exploitation. NTBFs are found to instill a culture of innovation, play a key role in developing systems of innovation, and encourage the investment needed for the generation of necessary skill sets. They ought to spin off NTBFs so as to enable India to solve the employment problem. Universities are vital contributors to R & D. This long-range vision in India is found wanting, consequently, R & D base is far too weak. World experience says that university research is the engine of job growth. The role of universities is changing fast in favour of research, innovation and entrepreneurship.

Infrastructure for Innovation Needed: Do Indian universities have innovation centres, Incubation centres, Research Parks, Licensing and technology transfer centres, Patent & IPR, Lifelong education and training centres etc. in partnership with the industry? These centres are in operation in developed countries for more than 50 years, and by virtue of them, their courses are innovative and enterprising. Why India does not have such creative centres yet? So long as universities do not have innovation infrastructure they are bound to remain behind their counterparts in developed countries, and the culture of entrepreneurship may not be strong. The challenge is how fast innovation infrastructure could be built.

***The ecosystem has to be built* to promote entrepreneurship**. Multifaceted centres like Research Parks, VCF, angle networks, IPR centre, innovation centres, etc. constitute innovation infrastructure. They create an enterprising ambience enabling students to acquire innovation and research skills. More the commercialization of technology more wealth generation. Innovation infrastructure in developed countries has generated a wave of entrepreneurship facilitating students to be creative, and tapping the global market. The wave of creativity, entrepreneurship and outward-looking culture in India has just started, and it is yet to make good progress. This is the major roadblock in employment generation.

Innovate or die. Small countries like Singapore, Newzeland have innovative infrastructure. Why developing countries like big India do not? This results in unemployment.

Universities without innovative infrastructure are not worth the name. Innovation infrastructure if provided many of the students would become 'First Mover Entrepreneurs' to generate and harvest brand new technology. The universities and students in

them would dream high, in tune with their global counterparts. Innovation infrastructure is much more than a learning place, it gives inspiration to students to generate economic surplus and become global players. The role and responsibility of universities should not be limited to merely bookish teaching & learning, i.e. yesterday's knowledge today. They have to go beyond innovation and employment generation.

Innovation in Indian universities is conspicuously absent. Students do not get global perspectives. This is a serious lacuna. They live in past while their counterparts abroad are ahead of time.

Can universities be the fountain heads of new knowledge and new technology and lighthouse for the industry? Then enterprising culture will grow. The universities in India should dream big, think great and jump at technology generation, and diffusion, which is achieving high significance to wipe off unemployment. They should deserve the status of Light House for the industry. They ought to become birthplace, 'Maternity Homes' for NTBFs.

Universities should envision giving birth and use sunrise technologies. We have to understand that in the 21st century traditional methods of working coming from years are going out of date. The obsolescence rate in technology is much faster. Jobs of old technology, and sunset knowledge are fast dying. It is believed that the life of a job in today's dynamic economy and fast-changing technology is about 7 years. A person is required to change jobs many times in his career. He cannot, unlike in the past, expect to keep doing the same job lifelong. He is required to keep learning new knowledge and new technology. Retraining of men and women lifelong fitting to ever-emerging new knowledge & new technology has become compulsory. Employers and employees have to be ready for spending time, money and energy on learning and relearning lifelong. So as to remain employed in a competitive world *It is now necessary to build a Learning society consisting of learning organizations and learning individuals. Will the universities in India show initiative in this direction?* Universities and colleges ought to redesign the courses and their contents fitting to new jobs, like robotics, artificial intelligence etc. which were unknown a few years before. This is a critical need. The shortage is noticed in areas like Artificial Intelligence, Digital data analytics, Enterprise architecture, etc. Entrpreneurship can flourish only if lifelong education centres are started by universities.

Innovation, Research and entrepreneurship are the prime instruments to create stat-ups. Technology research is the mother of innovation & entrepreneurship. How are the start-ups generated? Where are they generated? What needs to be done to generate jobs with new knowledge and new technology? The answer lies in continuous innovation and in continuous training and retraining of people, lifelong. This can't be done without advanced research by young energetic students and faculty in universities & colleges in their chosen fields of specialization. They should be equipped with innovation infrastructure. Lifelong education and training centres ought to be opened freshly in education institutes. I have personally visited a Continuing Education Centre in the area of project management at Boston University.

Government of India Initiatives Commendable: Government of India has recently started schemes like *Atma Nirbhar Bharat*, Start-ups, Skill India, Technology Incubation, Research Park, Make in India, etc. This is most welcome. They are in the infant stages. Many jobs are being created. Many entrepreneurs are coming up. Innovation systems are being developed. Technology incubators in partnership with industry are being installed in universities and engineering colleges. Best of the foreign universities are invited to put up their campuses on Indian soil. Prime Minister Mr. Modi has taken a drive to give a fillip to innovation in universities & colleges. The industry is also responding to it and trying to compete on innovation in the international market. The government has set up a national innovation board to provide funding to universities & colleges. The challenge is to implement this scheme effectively.

Revamping of Universities in India is in Process*. NEP-2020 is being implementated. Insufficient innovative activity in India is due to a shortage of people possessing innovation skills because innovation was not taught in universities & colleges. This is cited as a key factor behind underperformance, low productivity and unemployment. India has now recognised the full scope of the Innovation*

phenomenon and the Innovation board at centre and in states are set up.

Initiatives are taken by the government in various sectors to revamp the systems of working, for example in defence, agriculture, industry, construction, Roads, Railways, etc. The challenge is how to implement innovative schemes effectively.

World-class universities and world-class professors are needed to promote entrepreneurship. India is aiming at developing world-class universities. It is because those universities which rank high are found to produce globally competent professional and political leaders, besides able human capital so badly needed to manage people's affairs at national and international levels. Countries are developed only when they have world-class universities, not otherwise even if they have abundant natural resources. World experience tells us that in the knowledge-based economy of today, employment is driven by research, innovation and entrepreneurship, which thrives in only world-class universities. if India wants to come into the category of a developed country it has no other way than to make universities world-class. If India creates research-based world-class universities, it is more likely to become a developed country, as dreamed of in 2047.

How long Industry can be run on borrowed technology?

Multifacetated units like Research Parks, Technology Incubator, Patent & IPR centre, Innovation centre, Technology transfer centre, Venture capital, etc, constitute infrastructure found to lead the creation of an enterprising atmosphere enabling students to learn innovation skills is wanting. Installation of these centrees in universities costs but not installing them is much more costly. This needs to be realised by Indian authorities. More commercialization is wealth generation. In India, this innovative teaching is far too less, hence unemployment is far more. In developed countries a wave is created in favour of entrepreneurship in the whole society, people are creative, and they are tapping the market from developing countries, and the whole world. Unfortunately, the wave of entrepreneurship and innovation is not yet developed in India. People by tradition are inward-looking and not outward looking.

Joblessness is a common phenomenon in India on account of a lack of innovation. An OECD study observed that *those nations which lead in innovation tend to be more enterprising to win jobs than those that lag.*

Effective licening of IPR is needed to enable enterprises to succeed. Low-end jobs depend on the generation of high-end jobs.

A strong relationship exists between the effective licencing of Intellectual Property and innovative technology diffusion, entrepreneurship, generation and economic growth. So as to speedily diffuse innovative technology coming out of incubators, Research Parks, Centers of excellence effective licencing of IPR is essential. Then only much desired global level entrepreneurship with good quality jobs, of high tech, high income, will be generated, in the absence of which India is likely to be trapped in low growth, low income, low wage drove catagory economies of the world. National IPR policy holds the key to the growth of innovative, creative industries, and research-based disruptive industries which are so essential to generate high-end jobs. Low-end jobs depend on the generation of high-end jobs. Strong IP standards can alone fuel the growth of domestic research-based industries. They help to attract FDI and bolster India's prosperity. Hence effective licencing of IPR is strongly advocated for successful entrepreneurship, generation of employment and economic growth. Today licencing policy is weak. It needs to be strengthened, so as to promote entrepreneurship & employment.

Well-known saying goes, **the *low aim is a crime. Indian entrepreneurs*** must dream high, and think great, one day they can hope to be on top of the world**.**

Conclusion

- Universities in India are critical to Entrepreneurship education. Entrepreneurship education will grow by leaps and bounds only if UGC and universities give a fillip to it. If UGC & universities ignore India will remain a developing country. Students will keep migrating to developed countries.
- Universities have a major influence on a nation's capacity for innovation and entrepreneurship

- Can Indian universities now produce New Technology Based Firms, First Mover Entrepreneurs, and how many pertinent questions are to be asked to universities and professors? Do Indian universities have innovative character? Entrepreneurship education is at risk for want of innovative and enterprising universities.
- There is no reform more urgent than the reform of universities and colleges for entrepreneurship education, promotion and growth. They are supposed to produce leaders for industry [Intrapreneurs] and leaders for all other walks of life, so as to generate enterprises and in turn employment with growth.
- Universities & colleges in developing countries should have to adopt a new vector direction of giving birth to start-ups, rather than merely teaching bookish. This is the only way to promote entrepreneurship education.
- Innovation and research assume driver's role in entrepreneurship education, and development, giving birth to hi-tech start-ups.
- Labs in college must always be innovative, doing experiments to find out new knowledge, new theory, and discovery rather than merely testing to understand known theories and technologies. This is most wanted to make youths enterprising.
- Universities without innovation and entrepreneurship, without the mission of giving birth to firms are incomplete, irrelevant and dysfunctional in the modern sense. A University/ college without innovative infrastructure is not worth the name
- It is the bounden duty of universities and colleges to provide innovation infrastructure, which leads to quality education and enhancement in student's competency, which in turn to entrepreneurship and start-ups.
- Education charged with the spirit of innovation, entrepreneurship and discovery, is not a luxury, it is the basic need to make education competitive, to increase entrepreneurship and make education enterprising and job oriented.
- Resources are not in short supply, but the visions of the people who matter. Indian Universities must aim high and think great to produce leaders enabling industry to win. Universities must have to throw away the old shackles, and install an innovation culture. This is no more option but compulsion.
- Innovation infrastructure is not a financial liability but an asset. Innovation infrastructure generates money for college and wealth. If India does not become a centre of technological, organizational, and financial innovation there is no other way to groom entrepreneurship education.
- Funding for innovation should be done by the government on a priority basis. The first priority should be given to creating innovative universities.
- TV programs daily, like in USA will have to be started arranged for young budding entrepreneurs.
- Every university will have to arrange weekly discussions on innovation produced by it and make it available to entrepreneurs in society. Research -Innovation-start-ups provide a guarantee for the future and also economic security to the nation.

Research, innovation and start-ups are today's Guru Mantra for entrepreneurship education.

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Promoting Qualitative Research Paradigm: Some Issues and Concerns

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Research in education in the past six decades or so has been pre-dominantly conducted under the positivist perspective. The usual approach reflected a hypothetico-deductive framework in which it is assumed that reality is basically external in nature and it is out there. Thus, educational researches consciously or unconsciously were attracted mostly to study of facts and their relationship with theory and hypothesis. The overall endeavor in such pursuits has focused on formulating a research question and testing it through firm and specific research designs. The researchers' role in this framework is mostly that of an onlooker and a detached observer of events. During the sixties the concern for understanding the problems subjectively and through participant perspectives got underscored especially through sociological and anthropological researches undertaken by Chicago group of Sociologists in America. In the Indian contexts a shift towards qualitative research paradigm could be witnessed only towards the last decade of 20th century. It will be not for nothing to mention here, that the terms qualitative and quantitative research have been used quite recently in order to distinguish the approaches which purportedly focused on depiction of reality rather than theory or hypothesis testing as emphasized earlier.

The term qualitative research represents a good many techniques and approaches wherein the purpose is to highlight personal perspectives, feelings and perceptions of people towards their conditions and state of affairs in and through which they are constrained to develop a life script, problem perspectives and their interpretations as related to the reality in phenomenological forms. Now qualitative researches are encouraged not only in the disciplines of sociology and anthropology but also in the domain of psychology, education and teacher education sector as well.

Kiddler and Fine (1987) have made a distinction between two meanings of qualitative research. One they called 'big Q methodology' and other as 'little q'. According to them 'big Q' implies open ended, inductive research methodologies that are concerned with theory generation and explorations of meanings whereas 'little q' refers to the incorporation of non-numerical data collection techniques into hypothetico-deductive research designs. The 'little q' does not work from the bottom-up. The methods of data collection and analysis do not attempt to engage with the data, to gain insights into the ways in which participants construct meaning and / experience their world; instead they start with the hypothesis and researcher defined categories against which the qualitative data are checked. It will be pertinent to point out that the qualitative research is an umbrella term to denote a number of approaches to discuss and describe subjective reality by employing a heterogeneous set of methods and approaches such as grounded theory, phenomenological methods, case studies, ethnography, symbolic interactions, participant observations, ecological and narrative studies and focus group discussions to mention some of the most commonly used ones.

In the present paper an attempt has been made to discuss a few most representative approaches of qualitative research paradigms with a view to promoting their understanding and use in education in general and teacher education in particular. The paper also focuses on issues and concerns which arise in undertaking and encouraging researches to make use of such approaches in the Indian contexts.

Characteristic Features of Qualitative Research

As pointed by Bogdan & Biklen (2007), 'learning to do qualitative research means unlearning the social construction of research' and exposing oneself to the possibility of putting in place a different vocabulary and way of structuring the research process. As defined by them qualitative research has five distinct features which may be described as follows:

Naturalistic

The word naturalistic is connected with ecological approaches in biology drawing from this source. Qualitative research focuses on actual settings as the direct source of data and the researcher is the principal instrument in doing this. Qualitative researchers visit particular setting under study as

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they are concerned with context. They assume that action can best be understood when it is basically observed in the setting in which it occurs. It may be remembered that the settings have to be understood in a historic perspective. The researchers in the frame of reference, prima facie, are concerned in data produced by informants as in the case of official records and such researchers lay emphasis on knowing where, how and under what circumstances they came into being and they also probe into the historical circumstances and movements of which they are a part.

Whether qualitative research data are collected on classroom interaction by use of video tape recorder (VTR) or on experiences of principals, teachers and students through interviews, or depiction of life among the disadvantaged and poor classes by participant observation, qualitative researchers make an assumption about the human behavior. This reflects the assumption that human behavior is significantly influenced by the setting in which it occurs and whenever possible such researches go to such locations.

Descriptive Data

Another feature of this inquiry is that the research data take the form of words or pictures rather than numbers. These data consist of interview transcripts, field notes, video tapes, personal documents, photographs, memos and other official records. The data so obtained are analyzed with all of their richness as closely as possible with the form in which they were recorded and transcribed.

Another important consideration in respect of qualitative data is that in natural settings from which data are collected nothing is assumed to be trivial, that everything has the potential of being a clue that might unlock a more comprehensive understanding of what is being studied. While collecting data the researcher, therefore, usually asks questions such as 'why are these desks in the classroom arranged this way, how the more privileged ones view their facilities, how do students undertake the various activities and programs which are ongoing etc.' An important point in this regard is that nothing is taken for granted and no statement escapes scrutiny. Thus, description succeeds as a method of data gathering when every relevant detail is considered.

Emphasis on Process

In qualitative research the concern of the researcher is more with process rather than simply with outcomes or products. Rosenthal and Jacobson (1968), the pioneer experts in qualitative research laid stress on processes beneficial in educational research, in clarifying the self-fulfilling prophecy the idea that students' cognitive performance in school is affected by teacher's expectation of them. In this frame of perspective qualitative research strategies have indicated as to how the expectation are translated into daily activities, interactions and procedures.

It may be pointed out that the participant observation techniques have been used to find out the students' perception with regard to classroom problems. Rist (1970) demonstrated that when children were divided into groups based on social and economic criteria within the first few days of school, the teacher interacted more with her top group, allowed them more privileges and even permitted them to discipline members of the lower group. This kind of studies has focused on how definitions (teacher's definition of students, student's definition of each other and themselves) are formed. It is apparent, therefore, that in qualitative research data assume the form of rich description and the ongoing realities in a natural setting.

Inductive

Another important feature often associated with qualitative research is that emphasis is laid on analyzing data inductively. In such researches the attempt is made not to search out data or evidence to prove or disapprove hypothesis formed before entering the study. Instead, the focus is on the abstractions which are built as the particulars that have been gathered or grouped together. The process of theory building in this way arises from the bottom-up rather than from the top-down, from many disparate pieces of collected evidences that are interconnected.

Thus, the theory is grounded in the data and it is derived from and is made dependent on the data that the researcher procures- giving a name often referred to grounded theory of research. This approach to data gathering was developed by Glaser and Strauss (1967) and since then it has undergone a number of revisions. The focus is on progressive identification and integration of categories of meaning from data and coding which implies attaching descriptive levels and so on.

Meaning Giving As A Primary Target

It is pertinent to stress that in qualitative researches the researchers consider meaning as an

essential concern. The focus of qualitative researcher is on finding out 'participant perspective'. To arrive at such meaning giving framework, questions asked are- what assumptions do people make about their lives, what do they take for granted. In one of the lead researches using qualitative research paradigm, a researcher focused part of his work on parent perspective of their children's education. He wanted to know what parents thought about, why their children were not doing well in school. He found that the parent he studied felt that the teachers did not value their insights about their own children because of their poverty and their lack of education (Ogbu, 1974)

The concern of the researches in this regard is mainly on making sure that they capture perspectives accurately. In adopting qualitatively research procedures in education the questions usually asked are how people are experiencing, how they interpret their experiences and how they themselves structure the social world in which they live (Psathas, 1973). It is evident, therefore, that process of doing qualitative research is described basically as a dialogue or interplay between researcher and their subjects.

Some Selected Approaches to Qualitative Research as Applicable to Educational Research Context

As mentioned earlier, educational research in the Indian context has been pre-dominantly controlled and over powered by hypothetico-deductive research paradigm wherein hypothesis making and hypothesis testing are the twin important operations conducted under the overall framework of an explicitly drawn and developed research design. In this section of the paper, therefore, the most commonly used qualitative research methodologies have been briefly described so as to enable the professionals and potential researchers in education before considering them for use. Viewing the essential characteristics of qualitative research as explained in the previous section, the following eight qualitative research designs have been identified and the same are being discussed briefly.

Semi Structured Interviewing

The semi-structured Interviewing is the most widely used approach of data collection in qualitative research. It requires careful preparation and planning. The researcher has to think about who to interview (why), how to recruit participants, how to record and transcribe interview, what style of interviewing to use and what to ask from participant. Such an interviewing follows a specific guideline as developed by Spradley (1979) with four different types of questions indicated here under:

- Descriptive questions which prompt the interviewer to provide a general account of 'what happened' or 'what is the case';
- Structural questions aimed at identifying the categories and framework of meaning such as 'what does it mean, how did you decide' etc.;
- Contrast questions which allow the interviewee to make comparisons between events and experience; and
- Evaluative questions which are about the interviewer and feelings towards someone or something.

For the recording and transcription of the data, the researcher uses either audio or video tape recorders and transcribes the interview for further analysis.

Participant Observation

It may be noted that observation is a part of wide range of research activities. Flick (1998) has identified five features which characterize various types of observations such as:

- The extent to which the observation is covert.
- The extent to which it is systematic (standardized).
- Whether or not it takes place in natural settings such as school or classroom
- Whether or not the observer takes part in the activity that is being observed and
- How much of it involves at least self-observation.

Participant observation requires the researcher to engage in the variety of activities including participation, documentation (informal), interviewing and reflection. The researcher has to maintain a balance between participant and observation to ensure his/her involvement so as to understand what is going on, yet remaining detached enough, to be able to reflect on the phenomenon under investigation. The participant observer needs to keep detailed notes of the observation made. Such notes consist of description of settings, events and

people, as well as quotations or summaries of what people said. Such notes reflect on the researcher's role in the research, his/her relationship with the other participants and problems encountered in the field such as any difficulties associated with the performance of roles. These have also been called as methodological research. The participant observer is advised to record emerging things, connections and patterns and so on. These are the beginnings of the data analysis and theory building and are called analytical notes.

Grounded Theory

Grounded theory as a method of qualitative research was developed mainly by two sociologists-Barnay Glaser and Anselim Strauss (1967). Since then a number of revisions of this theory has been made. Basic principles of 'grounded theory' can be indicated briefly as follows:

- Grounded theory involves the progressive identification and integration of categories and their meaning from data. It involves both the process of the category identification and integration (as method) and its product (as theory).
- The grounded theory researchers use a number of key strategies including constant comparative analysis, theoretical sampling and theoretical coding.
- Having identified a category or linkages between categories, grounded theory researches are also required to look for negative cases which means those instances which do not fit.
- The process of data collection and data analysis continues until theoretical saturation which means up to the point until new instances of variation do not emerge.
- Memo- writing is an important segment of grounded theory method as the researcher maintains a written record of theory development-definitions of categories, justifying levels chosen for them, training their emergent relationships with one another and keeping a record of progressive integration of higher and lower level categories. As a consequence, memos provide information about the research process itself as well as about the substantive feelings. These can be long or short, abstract or concrete, integrative or original, using words or diagrams. They have to be dated, contain a heading and state which sections of the data they are related to.
- Grounded theory research begins with an initial research question to focus their attention on particular phenomenon they wish to investigate.
- Grounded theory as opposed to other methods, integrates the process of data collection and analysis and the researcher moves back and forth between the two in an attempt to 'ground the analysis into data'.
- The research report in grounded theory is written in a variety of ways containing information about the rationale of the study, about how it was carried about, what was found and what these findings may mean including their implications for theory and practice.

In sum, it may be added that Grounded Theory is concerned about what is and not. what should, could or ought to be. It has a realist orientation and produces knowledge of processes that reside in the data and which can emerge from the data. As a research approach it assumes that social events and processes have an objective reality in the sense that they take place irrespective of the researcher. The researcher acts as a witness and he/she observes carefully what is going on, takes detailed notes of proceedings, questions and participants in order to better understand what they are doing and why. In this process the researcher has to be careful enough not to import his/her own assumptions and expectations into the analysis; the aim is to develop theories that do not move or go beyond the data.

Phenomological Method

In phenomenological research an attempt is made to understand the meanings of events and interaction of ordinary people in particular situations. Edmond Husserl and Alfred Schutz who were the main proponents of this approach advocated that the world as it is experienced by human beings within particular context and at particular time rather than in abstract statements about the nature of the world in general, forms the basis of knowledge which would be free from the common-sense notions, scientific explanations and other interpretations.

The phenomenological method of acquiring understanding consists of three distinct phases of contemplation. These are epoch, phenomenological method of reduction and imaginative variation. Epoch requires the suspension of pre-suppositions and assumptions, judgments and interpretation to permit ourselves to become fully aware of what is

actually before us. In phenomenological reductions the constituents of our experience of the phenomenon are identified and we become aware of what makes the experience what it is. In the third phase which is imaginative variation an attempt is made to access the structural components of the phenomenon and to identify the conditions associated with it. In other words, while phenomenological reduction is concerned with 'what is experienced' i.e. its texture, the imaginative variation asks 'how this experience is made possible'. Finally, textural and structural descriptions are integrated to arrive at the understanding of the essence of phenomenon. The following features of phenomenological approach, therefore, need special attention.

- The Phenomenological approach may be descriptive or interpretative or both.
- It lays stress on gaining a better understanding of how the world appears to participants, of how participants perceive and experience the world from their own perspectives.
- Phenomenological research describes and documents the lived experience of the participants but it does not attempt to explain it.
- Smith (1996) argues that phenomenological analysis is concerned with cognition because it is concerned with understanding 'what the particular respondent thinks or believes about the topic under the discussion'.
- Phenomenological analysis is concerned with the ways the individual perceives the world. It is interested in participant's subjective experience of the world rather than its objective nature.
- As asserted by Psathas (1973) phenomenological enquiry begins with silence which means making an attempt to grasp what it is they are studying by bracketing an idea the informants take for granted. In other words researchers act as if they do not know what it means and study it to find out what is taken for granted, the emphasis being on subjective aspects of people's behaviour of the conceptual world of their informants.

Case Studies

Case study itself is a research method and represents the main exemplar of qualitative inquiry. It constitutes an approach to the study of singular entities involving the use of wide range of diverse methods of data collection and analysis. Thus a case can be an organization, a city, a group of people, a community, a school, a particular student or even an intervention, even a nation state or an empire.

According to Bromley (1986) case study involves an indepth, intensive and sharply focused explanations of natural occurrences with definable boundaries. Needless to mention that case studies have been used in many different disciplines including sociology, political theory, history, social anthropology, education and pyscho-analysis.

Carla Willig (2010) has identified the following five defining features of the case study research which entail the quintessential aspects of qualitative approach.

- *An idiographic perspective* --- which means the researcher is concerned with the particular rather than the general.
- *Attention to contextual data*--- It means that the researcher pays attention to the ways in which the various dimensions of the case relate to or interact with its environment.
- *Triangulation*---which implies an attempt to integrate information from diverse sources in order to obtain an indepth understanding of the phenomena under study. This may involve the use of a number of data collection and data analysis techniques within the framework of one case study. This is called triangulation which helps the researcher to approach the case from a number of different perspectives.
- *A temporal element*--- Case studies involve the occurrences over the period of time. They are concerned with the processes that take place over the time. This means that a focus on change and development is an important feature of case study.
- *A concern with theory*---The detailed exploration of a particular case can generate insights into social or psychological process which in turn give rise to theoretical formulations and hypotheses. Freud's psycho-analytical case studies constitute a clear example of the relationship between case studies and theory development.

Some other important features of case study research may be mentioned as follows:

- Case studies can be intrinsic or instrumental in nature, they may be single *vs* multiple case studies and descriptive vs explanatory case studies.

Intrinsic case studies may be undertaken because they are interesting in their own rights while instrumental case studies provide an opportunity to the researcher to study the phenomena of interest.

- In single case studies the case may constitute a critical test for a well formulated theory whereas in multiple case studies the researcher gets an opportunity to generate new theories.
- Descriptive case studies are concerned to provide a detailed description of the phenomena within its context while explanatory case study aims to generate explanation for the occurrences in which they are interested. Thus, an explanatory case study goes beyond mere narrative or descriptions.
- All case studies researches provide an example of being a detailed examination of one setting or a single subject, a single depository of documents or one particular event. They vary in their complexity but they are easier to accomplish.
- The general designs of case studies are best represented by a funnel which means that the start of the study is the wide end and gets narrower as the study proceeds.
- An important point in case study research is also concerned with the details of the individual participant's life events and hence the researcher needs to be particularly sensitive to issues concerning confidentiality and anonymity.
- The epistemological difficulties in respect of case study research relate to three important concerns such as triangulation, general ability and ethical difficulties as pointed out earlier. It is important therefore, that the researcher should pay heed to the fact that methods of data collection and analysis used in triangulation are appropriate to the research questions asked. The extent to which the case study research lends itself to generalization is a matter of debate in terms of the various research designs- intrinsic versus instrumental or multiple case studies as may be the case. The researchers have to be very careful about the way in which they generalize from their studies. Basically case studies are concerned with establishing the how and why of a complex human situation. This implies use of a variety of methods of data collection and analysis and producing an accurate and comprehensive description of the characteristics of the case as defined in the concerned research.

It may be observed that the 'real business of the case study is particularization not generalization…….. emphasis being on uniqueness and on the understanding of the case itself' (Stake, 1995).

To cap it all, it may be averred that case study is an extremely versatile method of research, in fact it is not a research method at all but an approach to the study of singular entities that make use of wide range of methods of data collection and analysis with an idiographic rather than nomothetic perspective.

Discourse Analysis

Another technique prevalent especially in the field of psychology for conducting qualitative research is called discourse analysis. This technique emerged as a challenge to cognitivism and as a critique of main stream psychology. In discourse analysis is involved a theoretical way of understanding the nature of discourse and the psychological phenomena. It may be pointed out that the discursive psychology was inspired by Ethnomethodology and conversation analysis and their interest in the negotiation of meaning in local interaction in everyday context. It studies what people do with language and emphasizes the performative qualities of discourse. Michael Foucault developed a special method of discourse analysis which has been named after him. Discourse Analysis focuses inter alia on two things – what kind of object and subjects are constructed through discourses and what kinds of ways–of-being these objects and subject make available to people. The following features of discourse analysis merit attention.

- The focus of analysis in discourse analysis is on how participants use discursive resources and with what effects and the attention is laid on the action orientation of task.
- The devices used in discourse analysis consist of metaphors and analysis, direct quotation, extreme case formulations, graphic descriptions, consensus formulations, and many more.
- The data collection in discourse analysis is centered on naturally occurring text and talk with semi-structural interviews.
- Discourse analysis requires a high level of reflexivity on the part of the researcher.
- Discourse analysis is more than a methodology. It involves conceptualization of language as constructive and as functional. It requires the

researcher to look at language in a different way and to ask different questions.

- Discourse analysis seeks to understand the true notion of psychological phenomenon such as memory, social identity or prejudice.
- The emphasis in discourse analysis is on social constructivism in as much as the knowledge produced through it makes use of interpretative and discursive devices.
- The approach adopted in discourse analysis does not make any apriori assumption about the nature of the world.

Finally, it may be observed that as a qualitative research tool 'discourse analysis can never tell the truth about the phenomena'. According to a discursive perspective, such a thing as 'the truth' itself is not recovered from but rather constructed through language.

Ethno-Methodology

In qualitative research ethno-methodology refers to the subject matter to be investigated rather than the methods the researcher employs to collect the data. It refers to the study of how people create the data. It refers to the study of how people create and understand their daily lives- their method of accomplishing everyday life. Garfinker (1968) while giving a short hand definition of ethno-methodology observed: "I would say we are doing studies of how persons, as parties to their ordinary arrangement, used the features of the arrangement to make for members the visibly organized characteristics happen." In other words, ethno-methodologists try to understand how people go seeing, explaining, describing order in the world in which they live. A number of educational researchers have been influenced by this research. The researchers in this mode use phrases such as "common sense understanding and everyday life", "practical accomplishment", "routine ground for understanding" and "accounts".

One issue to which ethno-methodologists have sensitized researchers is that research is itself not a uniquely scientific enterprise; rather it can be studied as a practical accomplishment. They have suggested that we look carefully at the common sense understandings under which data collectors operate. They impress upon researchers working in the qualitative mode to be more sensitive to the need to 'bracket' or suspend their own commonsense assumptions, their own world view instead of taking it for granted.

Thus, in ethno-methodology we witness now different frameworks such as cultural studies, feminism, critical theory and institutional ethnography. These researchers reject the ideas that the world is directly knowable. This is so because all social relations are influenced by power that must be accounted for in analyzing informants' interpretations of their own situations. They also maintain that all research is informed by some theoretical understanding of human and social behavior. In sum, these views suggest that when qualitative researchers undertake research, they engage in a kind of dialogue with their informants. Their own theoretical and ideological views are powerful but these perspectives are also shaped by what they learn from their informants.

Instructional ethnography is a contemporary form of research. It was developed by Dorothy Smith (2005). This approach tends to connect ordinary people's everyday lives with what she calls 'ruling relations'. The focus here is on finding out as to how these ruling relations organize 'people's everyday lives'. It connects macro and micro levels of society and tries to show how issues that many might consider personal problems are actually shaped by the institution within which one works or that have control over the resources people have available to them. Such researches claim that their approach enables researchers to map social relations.

Action Research

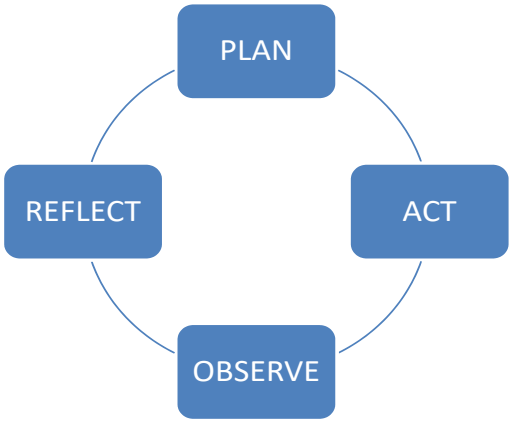
Action research is credited to have been developed for the purposes of educational improvement by Stephen M. Corey (1953) deriving from the work of Kurt Lewin in the 1940s. The modern usage of action research owes much to the work of Stenhouse (1975) who suggested that the work of the teachers be researched, and by teachers themselves. He however felt that this study or research should be supported and guided by the use of professional researchers who would also choose the focus for the research. In the late 1970's Elliott suggested that the research was an effort to understand the social situation in which the participant finds himself and was thus located in the teacher's intrinsic rather than the researcher's external concerns. It focused on the reciprocal relationship between theory and practice claiming that theories are not validated independently

and then applied to practice rather they are validated through practice.

Thus, the perspective which developed was that the researcher has to be both theoretical as well as practical in approach and each aspect of the research depends on and supports the development of the other providing an almost conversational relationship between them. The following features of Action research may be specially heeded.

- Action research is a research by the practitioner, of the practitioner and of the practitioner.
- The purpose of action research is basically ameliorative and it aims at making both the educational situations and the practitioners better from the point of time a situation is identified.
- Action research draws upon strategies and concepts such as authenticity and truth, individual voice, reliability and so on.
- Action research transforms both the nature and the possibilities of both action and research.
- Action research uses democratic principles and a move away from the theory dominant hierarchy of many other approaches to research.
- The conversational relationship between theory and practice as indicated in action research is suggestive of provisionality in our understanding of what counts as knowledge than more positivistic approaches would imply.
- Since Action research implies the improvement of practice the action research can move from a problem solving responsive strategy to one which is problem posing or problematizing continually subjecting practice to critical enquiry, challenging that taken for granted and consciously seeking alternative perspectives as means to generate the understanding that will become practical improvements. (Mary MacAteer, 2013)
- Action research involves a reflective perspective with four sets of action words- Plan, Act, Observe and Reflect. Kemmis, (1981) & Mctaggert, (1981) encourage a four step approach introducing the element of 'observe' in a similar way as shown in figure -1.

Fig-1: Four Step Approach of Observe and Reflect

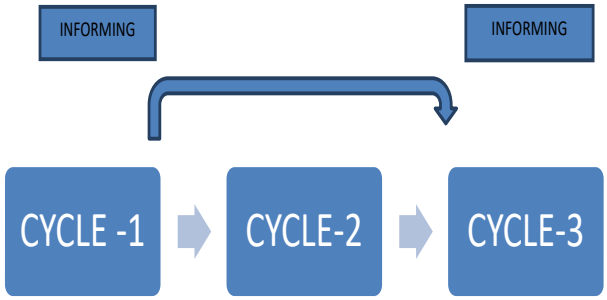


This is basically indicative of a cyclic nature of action research in which the outcomes of each cycle contribute towards informing the development of next series of cycle as shown in Figure 2.

- There is an inherent claim for values in action research. Since it involves an element of responsibility in relation to the consequence of one's action, it requires that one knows what they are. One has to be satisfied that they satisfy the educational principles and values, which are one's own measure of worth of the educational practice. Eliott (2000) and Kar (1987) clearly articulate the presence of and more importantly the need of exploration of value in action research.
- Action research is a dynamic and situation specific intervention which is carefully thought about, planned and implemented to improve the problem related contexts. Hence, through use of these interventions the situations as well as the practitioners involved in it both improve.

In the Indian context action research can be put to use in school related situation by and large as an application device and not as specific interventions contemplated to bring about intended changes. In some of the situations, innovative practices and action research interventions have been considered inter-changeable terms but the same is not justified.

Fig-2 Cyclic Nature of Action Research



Quality in Qualitative Research

It has been pointed out in this presentation that overall concern of qualitative research is with meaning in context and it involves the interpretation of data. Thus, as averred by Carla willig (2010), the 'role of qualitative researcher requires an active engagement with data which presupposes a stand point or point out departure.' This implies that qualitative research acknowledges a subjective element in the research process. Several authors have tried to identify the criteria for judging the quality of qualitative research. For example Henwood and Pidgen (1992) indicated seven characteristics of good qualitative research such as the importance of fit, integration of theory, reflexivity, documentation, theoretical sampling and negative case analysis, sensitivity to negotiated realities and transferability which means applicability beyond the specific context within which the data were generated.

More recently Elliott et al (1999) have developed some specific guidelines for qualitative research reports. Some of these are: Owning one's perspectives, situating the sample, grounding in examples, provides credibility checks, coherence, accomplishing general versus specific research tasks and resonating with readers. To conclude, it may be pertinent to quote Madill et al (2000) that, "qualitative researchers have a responsibility to make their epistemological position clear, conduct their research in a manner consistent with that position and present their findings in a way that allows them to be evaluated approximately."

In the Indian context research focus is called for to impart an epistemological perspective to qualitative research particularly being undertaken in the field of education and psychology. It will be worthwhile to mention that training in qualitative research methodology and the potential for its intelligent and appropriate use need a special concern by the universities and funding organizations which the recently introduced NPE 2020 aptly reinforces. Sooner this is done better it will be. In a bid to shift our emphasis from hypothetico-deductive paradigm to empirico-inductive paradigms in educational research it will be better to recall the words of Benjamin Franklin, "We must indeed all hang together, or, most assuredly, we shall all hang separately". Further, to quote Howard Gardner, 2005, the world of the future-with its ubiquitous search engines, robots and other computational devices-will demand capacities that until now have been mere options. To meet this new world on its own terms, we should begin to cultivate these capacities now.

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Ethical Issues in Research: The Emerging Issue

Piyali Bose* and Jayanta Mete**

Researchers working in academia enjoy a number of important freedoms and privileges – the principle of academic freedom (UNESCO, 1997) - which are essential to maintain the independence of the higher education research community. These freedoms include freedom of inquiry and the right to disseminate their findings, freedom to challenge conventional thought, and the opportunity to conduct research on human participants with public monies, trust, and support.

However, researchers and institutions must also recognize that such freedom carries with it significant responsibilities, including the need to ensure that research involving human participants meets high scientific and ethical standards (Department of Health, 2001/2005, E SRC, 2005/2010). It also implies duties of honesty, integrity, objectivity, accountability and openness alongside thoughtful inquiry, rigorous analysis, and the application of professional standards (Nolan Committee, 1995). An understanding of the ethical boundaries and rules is of utmost importance in carrying out research work.

Research Ethics

Research is a systematic, socially organised quest for new and better insight. Scientific knowledge is of great value itself. Many research results can be useful for improving social conditions. The responsibility of research is to seek the truth. Accordingly, scientific integrity is a key aspect of research ethics.

Ethics is the branch of philosophy that is concerned with morality. It can also refer to a set of principles and practices that provide moral guidance in a particular field. There is an ethics of business, medicine, teaching and scientific research too. As a concept, 'research ethics' refers to a complex set of values, standards and institutional schemes that help constitute and regulate scientific activity. Ultimately, research ethics is a codification of ethics of science in practice. In other words, it is based on general ethics of science, just as general ethics is based on common sense morality.

Cultural and social studies deal with human choices, actions and relations, standards and institutions, beliefs and historical developments, works and traditions, languages, thoughts, and communication. Empathy and interpretation are the basis of the research process. This can open the door to different reasonable interpretations. However, the inconclusiveness attached to research doesn't relieve researchers from the obligation to shun arbitrary views and to strive for clarity in their reasoning. In many disciplines, there is disagreement over fundamental questions of scientific theory. However, honest documentation and consistent reasoning are absolute requirements, regardless of scholars' position with a view to theory. In the humanities and social sciences, research is distinguished by researchers' views on society and humanity, a factor that is usually enriching. However, this requires that researchers consider how their own attitudes can color their choice of topics, data sources, and the balance between possible interpretations.

At an overall level, all disciplines are subject to the same research ethics obligations, e.g. requirements for interesting and relevant research issues, verifiable documentation, impartial discussion of conflicting opinions, and insight. The requirements for professional independence and peer review are also universal. The basic research ethics standards are based on the general moral standards of society. The ethical responsibilities inherent in research are partly associated with standards related to the research process, including relationships between researchers, and partly with respect for the individuals and institutions being studied, including responsibility for the use and dissemination of the research.

Importance of Research Ethics

There are various important reasons for adherence to ethical norms in research. First of all, norms promote the aims of the research, such as knowledge, truth, and avoidance of error. For

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example, prohibitions against fabricating, falsifying, or misrepresenting research data promote the truth and minimize error. Second, since research often involves a great deal of cooperation and coordination among many different people in different disciplines and institutions, ethical standards promote the values that are essential to collaborative work, such as trust, accountability, mutual respect, and fairness. For example, many ethical norms in research, such as guidelines for authorship, copyright and patenting policies, data sharing policies, and confidentiality rules in peer review are designed to protect intellectual property interests while encouraging collaboration. Most researchers want to receive credit for their contributions and do not want to have their ideas stolen or disclosed prematurely. Third, many of the ethical norms help to ensure that researchers can be held accountable to the public. Fourth, ethical norms in research also help to build public support for research. People are more likely to fund a research project if they can trust the quality and integrity of research. Finally, many of the norms of research promote a variety of other important moral and social values, such as social responsibility, human rights, animal welfare, compliance with the law, and public health and safety. Ethical lapses in research can significantly harm human and animal subjects, students, and the public.

International Ethics Code

Few of the international codes and policies include:

- Code of Ethics from the International Sociological Association
- Universal Declaration on Bioethics and Human Rights from UNESCO
- International Ethical Guidelines for Biomedical Research Involving Human Subjects from the Council for International Organizations of Medical Sciences (CIOMS)
- Declaration of Helsinki from the World Medical Association
- Nuremberg Code
- The Chemical Professional's Code of Conduct from the American Chemical Society
- Singapore Statement on Research Integrity
- ICH Guidelines from The International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use

According to Shamoo A and Resnik D. (2015), there are certain traits of responsible conduct of research.

Honesty

Strive for honesty in all scientific communications. Honestly report data, results, methods and procedures, and publication status. Do not fabricate, falsify, or misrepresent data. Do not deceive colleagues, research sponsors, or the public. With honesty the task of research is also smoothened in a much better way, the reason for that is when we do research our target is to provide true knowledge about some kind of myth or produce knowledge on an unknown topic. Therefore, honesty plays a great role in giving us a better outcome.

Objectivity

Strive to avoid bias in experimental design, data analysis, data interpretation, peer review, personnel decisions, grant writing, expert testimony, and other aspects of research where objectivity is expected or required. Avoid or minimize bias or self-deception. Disclose personal or financial interests that may affect research. Bias in research data affects a lot of people. Let's take an example of the Amazon recruitment system, an AI machine that was made to recruit people in the company. When the machine was given the data, it took a bias toward male candidates. Female candidates were rejected even though they had proper qualifications. The reason for that was a lack of proper research when it came to the training data provided to the machine. The research data should have been curetted and then only given to the machine. The same thing happened with an AI machine that was used by the court to quickly get through cases. The data was biased toward black people and that gave harsh punishments to them even though they had just got a parking ticket. We have to remember that as research scientists we have a lot of responsibility towards data and it needs to be curated properly before using it for any kind of research calculations.

Integrity

Keep your promises and agreements; act with sincerity; strive for consistency of thought and

action. When we talk about integrity, we as research scientists have to keep our promises and whatever agreement we have with any party. We get data from different sources and for that, we may need to get into agreements with different parties with the promise of returning back something. These are not to be done verbally, there must be advocates for both parties who need to come together to create a proper agreement, and then only it should be moved forward. Along with this we also need to be consistent about what we are doing, having focused research on a certain field, the thought process as well the action needs to be taken very carefully. We must be consistent in our performance even if we have we are facing failures in our research.

Carefulness

Avoid careless errors and negligence; carefully and critically examine your own work and the work of your peers. Keep good records of research activities, such as data collection, research design, and correspondence with agencies or journals. Handling of data is of the utmost importance because this is something that can take our research in the direction that we want, handling of data with proper channels must be done. The chain of data should be maintained and tracked from time to time. When we do our own work to need to keep a proper journal which could be in any form either written, audio, or video format. When we work with the data collected by our peers, we should be handling it carefully as we are going to use it for our research purpose. The data given by our peers must not be altered under any circumstances, if any discrepancy is found we can contact our peer to resolve the issue.

Openness

Share data, results, ideas, tools, and resources. Be open to criticism and new ideas. The great Indian scientist Jagadish Chandra Bose never thought of patenting his work to have any financial gain. He always said that his works are free to all and anyone working in that field can take his research and do something new out of it. He even donated all his research work to the future generation. Currently, we all researchers are always looking for financial gain rather than sharing our research with the community and giving everyone a chance to do their research.

Respect for Intellectual Property

Honour patents, copyrights, and other forms of intellectual property. Do not use unpublished data, methods, or results without permission. Give proper acknowledgment or credit for all contributions to research. Never plagiarize. In this media-based world where everything and anything is being copied, we should be respectful towards any intellectual property. When we are working on some research if we have to use any work from other researchers either we should take proper permission or we must acknowledge their work. We must not steal ongoing research and publish it as our own.

Confidentiality

Protect confidential communications, such as papers or grants submitted for publication, personnel records, trade or military secrets, and patient records. Data confidentiality is a very sensitive topic. What should be revealed and what not? There are a lot of controversies regarding that. When we are in the field of medical research, a lot of data is being taken from the patients and that needs to be secured properly. The chain of data has to have proper security measures. The results of patient experiments are to be revealed only to the patient and not to any near relative until the patient said so, in case the patient is unable to decide, either spouse or parent, or siblings should be notified. No falsified information should be provided to the patient who is part of the research as well as any kind of false hope. Whatever the results show, good or bad it must be shared with the patient. We sometimes see lot of research data being published by whistle-blowers. When an employee joins a company, they must sign a non-disclosure form and it must be punishable when violated. Let's go through one more example of such. A teacher joining a school has access to all the student records under them. Sometimes for any reason they can leave and take the data along with them and leak it on any social media. The non-disclosure form must be signed too before a teacher joins any institution. The teacher has one of the most sensitive data along with them.

Responsible Publication

Publish in order to advance research and scholarship, not to advance just your own career. Avoid wasteful and duplicative publication. As we discussed earlier also that nowadays most of us want

to get ahead in research and gain some publications under our belt as quickly as possible. In doing so we are losing the quality of research. The number of publications is not directly proportional to the quality of research. Time given to every research and every paper should be and this is creative work and creative work takes time to do.

Responsible Mentoring

Help to educate, mentor, and advise students. Promote their welfare and allow them to make their own decisions. This is mainly for those professors who take Ph.D. candidates. We actually sometimes have trouble understanding the word mentor. Research candidates take it as one who is going to help them complete everything that they do. But the term actually means a guide who is going to show the path to solve a problem and guide the research scientist to do it and not solve it by themselves. The main task of a mentor is to bring out the inner talent that a research scientist so that they can improve themselves in their own way.

Respect for Colleagues

Respect your colleagues and treat them fairly. In a school environment we are always doing so, that is respecting each other as there is very little competition. Whereas when we are in the field of research the competition is fierce. Even though we smile at them and praise their work but internally we do feel that we were unable to do the same and get the respect that we deserve. Rather than feeling that we must sharpen our own skills and motivate ourselves to do something much more that can give us what we want. In that way not only, will also be able to give respect to others we too are going to get respect from our colleagues.

Social Responsibility

Why do we do research? Personal gain? Social gain? It raises an ethical question for the research scientist what is their responsibility towards society? When research is conducted the data is taken from the common people so the outcome of the research too should have an impact on society. Our research should focus on what we do for our society and how it can uplift it and make things better. Strive to promote social good and prevent or mitigate social harms through research, public education, and advocacy.

Non-Discrimination

Discrimination towards gender is something that is prevalent in society and not only regarding gender but also from caste and creed. It has come to light in recent years that Dalit research scientist Rohit Vemula of the University of Hyderabad had committed suicide and the causes came to light that he was being discriminated against because of his caste. There was a widespread protest regarding it. Sensitivity training is to be provided in all places of education so that any kind of discrimination can be avoided.

Competence

Education never ends. Continuous educational research is the best way to maintain and improve our own professional competence and expertise. We must take steps to promote competence in science as a whole. Research is always something about science. Science as a whole is too based on research. Anything that we do in science has been found based on research. Research on chemicals gave us different types of cosmetics to pesticides. Research on education gave us different methods to teach and train children into adults. As a research scientists, our knowledge is the base of whatever work we do. When we do research we do it on the basis of our knowledge.

Legality

In the field of research, we must be careful about the laws of every place that are part of the research. Laws and contracts are very important as we need to abide by them. Data collection and analysis all need to be done according to the law. Research in the field of Artificial Intelligence is something that needs to follow the laws regarding the privacy of users. We must know and obey relevant laws and institutional and governmental policies.

Animal Care

Show proper respect and care for animals when using them in research. Do not conduct unnecessary or poorly designed animal experiments.

Human Subjects Protection

When conducting research on human subjects, minimize harms and risks and maximize benefits; respect human dignity, privacy, and autonomy; take

special precautions with vulnerable populations; and strive to distribute the benefits and burdens of research fairly.

Protection of Human Subjects

Research studies involving various human subjects contribute to the advancement of medical and health sciences. Such studies provide useful data on the safety and efficacy of new lines of treatments, therapies, drugs, or devices. However, the involvement of human subjects does increase the risk and harm to the subjects. Therefore, clinical studies are highly scrutinized and regulated by various means. Researchers should not only follow relevant international guidelines but also abide by local or state regulations for the protection and welfare of human subjects. For instance, in the U.S., Title 45 of the Code of Federal Regulations, Part 46 (45 CFR 46) from Health and Human Services (HHS) and 21 CFR 50 and 56 from FDA, define rules for human subjects research. There are effectively two types of clinical studies.

- Intervention studies/clinical trials
- Observational studies

Moreover, different standard guidelines exist for designing, conducting, and reporting intervention and observational studies.

Most of the journals require authors to register clinical trials prior to publishing research in public clinical trial registries such as Clinical Trials.gov, ISRCTN registry, and EU Clinical Trials Register. The journals also encourage authors to submit statements indicating that international guidelines and best practices were followed in these trials.

Care of Laboratory Animals

Studies involving laboratory animals have provided insights into the development of different types of new vaccines and drugs. Unlike human subjects, laboratory animals cannot give informed consent, and therefore, the care and use of animal subjects in a study warrant attention from researchers. An Institutional Animal Care and Use Committee (IACUC) in universities or institutes ensure that appropriate procedures and study protocols are followed for the welfare and humane treatment of all animal subjects.

Kilkenny et al. laid out extensive guidelines, called ARRIVE (Animal Research: Reporting of In Vivo Experiments) to improve the reporting of studies involving animals. Moreover, the principles of the 3Rs (Replacement, Reduction, and Refinement) proposed by Russell and Burch more than 50 years ago have now been globally accepted and implemented. In addition, the National Institute of Health (NIH) Office of Laboratory Animal Welfare (OLAW) provides extensive resources on policies and guidelines on the use of animals. The journals require authors to submit documents to indicate whether institutional or national guidelines for animal subjects were followed and whether approval was taken from the relevant ethics committees. Many journals have the right to reject manuscripts if these requirements are not followed.

Ways of Handling Conflict of Interest

The changing scenario of the research environment and collaborations can often give rise to conflicts of interest and commitments. Therefore, it is important to maintain transparency in research and publication by both authors and publishers. Conflicts of interest can arise when an author, researcher, editor, or peer reviewer has a relationship (personal or financial) that can directly or indirectly affect his/her objectivity in making decisions or influence his/her actions.

Conflicts of interest can arise because of the following:

- Financial relationships: These can include direct employment, consultancies to a related organization/company, stock options, grants, patents, and paid expert testimony.
- Personal relationships: These can include rivalries and bias.
- Intellectual beliefs: These can include moral convictions or personal beliefs that can influence scientific opinions.
- Academic competition: It can include biased judgments because of direct or indirect competition with peers or colleagues.

The Office of Research Integrity (ORI) suggests that to manage or remove conflicts of interest, take the following steps:

- Disclose all interests so that the stakeholders are aware and can take the required steps.
- Monitor research and research results for transparency and integrity.
- Remove the person in question from important processes such as data interpretation or review process.

Managing Research Data

Data are important outputs of a research process. These can be used to accept or reject a hypothesis or frame a new hypothesis. Data management, therefore, is crucial during and even after the research. It can include the following aspects:

- Data ownership: It implies ownership of the legal rights to the research data during and after the research project. The important stakeholders include funders, research institutions, principal investigators, and even data sources.
- Data collection: It implies a consistent and quality-controlled collection of data. A few important aspects include obtaining required authorization, using appropriate methods, and applying attention to detail.
- Data storage: It implies the protection of data from damage, loss, or theft. Data storage is important to recheck the findings, prioritize research activities/tasks, and be reanalyzed by others.
- Data sharing: It implies deciding what to share and with whom (general public or other researchers) to share the preliminary data or final results. Data withholding is also an important aspect.

Researchers have the responsibility to maintain the integrity of the research data. The group members involved in the handling of the data should maintain privacy and confidentiality of the data while recording on hard-copy or electronic evidence.

Assigning Authorship

Allocating authorship allows researchers to assign appropriate credit and acknowledge their contribution to the research. However, assigning authorship is not always that simple as it also implies accountability and responsibility for the published work. Authorship issues can sometimes lead to conflicts and give rise to misconduct. Many journals now, therefore, request researchers to submit contributorship statements mentioning the role of each researcher. According to ICMJE, an author must satisfy these four criteria.

- Made substantial contributions to the design and conception of the study; data collection, analysis, and interpretation.
- Drafted or revised the intellectual content/output.
- Approved the final version of the manuscript for publication.
- Agreed to be accountable for the research work, ensuring that queries related to the accuracy or integrity of the research are resolved.

Moreover, the author should be able to identify which co-authors are responsible for which part of the work. According to ICMJE, in a large multi-author study, the decision on authorship should be taken before submitting a manuscript to the journal. Each author of such studies should qualify those four criteria and individually submit conflicts of disclosure forms to the journal editor. Additionally, some large multi-author groups can choose a group name to assign authorship. In that case, a group name should be used when making a submission to the journal along with a description of whom all qualify as authors in that group.

Apart from that, the corresponding author communicates with the journal during manuscript submission, peer review, and publishing. He/she ensures that all the documentation requirements related to ethics committees' approvals, authorship, conflict of interest, clinical trial registration, etc. are met. The Authorship issues are as follows:

Guest Authorship

Guest authorship refers to senior authors who are included because of their respect or influence in the hope that this will increase the likelihood of publication and/or impact of the paper once published. Conventionally, guest authorship is an unethical concept, thus most journal editors have a clear policy to prevent this situation. For instance, many journals require authors to clarify their individual contributions in the final article.

Gift Authorship

Gift authorship consists of authorship obtained by the offer of another author (honorary or not) with

objectives that are beyond the research article itself or are ulterior, as promotion or favor. Gift authorship occurs when someone is credited as an author, taking acknowledgment for a research paper when, in fact, he/she hasn't really given any contribution to it whatsoever. This is a very common type of unethical behavior. There are several motivations for such misconduct to happen. Junior researchers might feel pressured to assign authorship to older colleagues, thinking that this might bring better chances of publication and credibility. Senior authors might want to award someone who has helped them in the past or gratify co-workers and collaborators to maintain good relations with them.

Ghost Authorship

A ghost author is a person who has made a substantial contribution to the research or writing of a manuscript but is not named as an author. Ghost authorship is common to journals reporting large-scale clinical trials, regulatory documentation, and literature summaries for healthcare professionals. In this situation, however, it is particularly rewarding when a qualified writer has a direct impact on improving medical literacy. In the world of academic studies in general and the field of research in particular, ghost writing is also considered to be a form of plagiarism and unethical behavior.

Ways to Avoid Plagiarism

When drafting the manuscript, authors refer to published/unpublished work to draw upon ideas or to support their statements. However, researchers often end up in a plagiarism trap intentionally or accidentally. Plagiarism is defined as an unethical practice of using someone else's work, ideas, data, concepts, words, methods, images, etc. without proper acknowledgment and presenting them as their own. It is a serious misconduct and professional infarction. Therefore, it is important to give appropriate credit to the author or the source. The severity and extent of plagiarism can vary and can fall under the following categories.

- ***Complete Plagiarism/ Intellectual Theft***: Submit work under one's name when somebody else has created it.
- ***Source-based Plagiarism*****:** Reference a source that is incorrect or does not exist i.e. a misleading citation. This may also occur when the author cites only the primary source without citing the secondary source from where information was obtained.
- ***Verbatim Plagiarism***: Copy word-to-word from the original work without quoting and citing it.
- ***Self-plagiarism***: Reuse significant portions of your own previously published work without attribution.
- ***Paraphrasing Plagiarism*****:** Use someone else's writing with some minor changes in the sentences (using synonyms) and use it as one's own work.
- ***Mosaic/Patchwork Plagiarism***: Interlay someone else's phrases or text within your own work.

Plagiarism is a very serious offense. It can not only have legal implications but also damage the credibility and reputation of the author. In academic publishing, plagiarism can lead to retraction of the published work and loss of academic positions or jobs.

To avoid plagiarism we can use AI base software that can easily go through the text and can detect if any part of the task is plagiarised and then help the researcher to avoid it or rephrase it. The best way to avoid plagiarism is to study a part of the text and rewrite it in our own words. That helps to retain the topic and also avoids plagiarism. One such software a researcher can use is Microsoft Word part of Office 365 as well as Grammar.

Publishing Research Ethically

Researchers mainly use journal articles or books to communicate the results of their research to the scientific community and the general public. Therefore, following publishing ethics is equally important for researchers and journals. Journals require authors to disclose whether the same research has been published before or is being considered for publication elsewhere. Duplicate publications and simultaneous submissions account for serious misconduct. Often, in biomedical research, authors present the same data with different analyses (of a subgroup). In that case, authors should disclose the original source of the data and previous publications when making a submission. ICMJE defines simultaneous submissions and duplicate publications as follows:

- Simultaneous Submissions: Submitting the same manuscript in the same or different language(s) to one or more than one journal at the same time.

- Duplicate publications: Publishing a paper that is significantly similar to the paper published previously.

The Committee on Publication Ethics (COPE) has outlined guidelines for journal editors to identify and avoid such misconduct in submitted manuscripts and published papers.

Researchers should consider the following points to avoid unethical publishing practices.

- Do not submit the same paper to different journals.
- Maintain transparency during the submission and peer review process on previously published work (disclose publication in conference proceedings, submission to a pre-print repository etc.).
- Check with the publisher about translating and publishing the work again.
- Disclose already published and/or translated versions of the submitted manuscript.
- Avoid dividing your study into multiple publications.

Journals may allow secondary publications in certain cases

- Author(s) has got approval from the editors of both journals (ensure they have access to the original published work).
- The editors have agreed on the publication interval between the primary and secondary publications.
- The secondary publication refers to the data and interpretation of the primary publication.
- The secondary publication informs readers that the primary publication has been published previously (whole or in parts) by citing it appropriately.
- The title should indicate that it is a secondary publication.

Research Misconduct

The ORI defines research misconduct as fabrication, falsification, or plagiarism in designing, conducting, or reviewing research or reporting the findings of the research. Falsification involves misrepresentation of the research by changing data or results or by tampering with equipment, research methods, or materials. Fabrication involves reporting false or made-up data, results, or research outputs. Plagiarism involves presenting others' ideas, works, or words without acknowledging or providing appropriate credit to the original authorship. Universities and research institutions define policies and guidelines for researchers to maintain scientific integrity while conducting research.

Image Manipulation

A growing number of research misconduct cases handled by the Office of Research Integrity involves image manipulations. Manipulations may include simple image enhancements, misrepresenting an image as something different from what it is, and altering specific features of an image. Photo manipulations can occur during a shoot based on equipment settings. But the potential for ethical questions arises primarily from post-shoot image manipulation. If digital photo manipulation creates an image that is misleading or deceptive, reviewing the ethics of the situation is always the right thing to do. A growing number of research misconduct cases handled by the Office of Research Integrity involve image manipulations. Manipulations may include simple image enhancements, misrepresenting an image as something different from what it is, and altering specific features of an image.

This type of manipulation can be checked by any journal by using AI-based image processing techniques that can detect subtle changes in an image and then compare it with any existing image. Publication houses must have access to a wide range of images. Sometimes researchers might just manipulate an existing graph that is just available on google. Reverse image searches can produce proper results.

Research Reproducibility

Reproducibility in research is important to validate findings. Reproducibility is defined as when a researcher is able to duplicate the same phenomenon even when experimental conditions are varied. Whereas, replicability is defined as when a researcher is able to obtain the same results when the experiment is conducted under the same experimental conditions. Although reproducibility is promoted in science, researchers are not keen to replicate or

read published results. Moreover, published work is expected to be reproducible but it's rarely tested on those grounds later. It is the responsibility of the researchers to promote reproducibility. Without it, we will not be able to find out whether the research was done properly with proper data. Research is always about studying what was done previously proving it wrong or appending something new to that. Until the researcher is able to do the same experiment under the same conditions the researcher will not be able to follow what was done and what has to be done to improve it.

It is important to note that reproducible research is not always correct. There are many ways as follows:

- False positives in published research.
- Bad quality of data and data analysis.
- Poor study design.
- Missed confounding variables.
- Omitted data points.

Conclusion

Most of the research involving human beings is directed toward advancing human welfare, knowledge, and understanding, and towards the study of social or cultural dynamics. Such work is undertaken for various reasons such as to alleviate human suffering, to validate social or scientific theories, to dispel ignorance, to analyze or evaluate policy, and to understand human behavior and the evolving human condition. Such research is primarily driven by the desire for new knowledge and understanding and may have a number of benefits. Ethical frameworks are, however, developed within a continuously evolving social context which includes the need for research, moral values, and ethical principles. Universities and research institutions define policies and guidelines for researchers to maintain scientific integrity while conducting research. The entire researcher should be aware of the university's policies.

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Democracy and Education: Complementary to Each Other

Justice S. Abdul Nazeer, Hon'ble Judge, Supreme Court of India delivered the Convocation Address at the 40th Annual Convocation Ceremony of the Mangalore University, Mangaluru on 23rd April, 2022. He said, "Education plays a cardinal role in transforming a society into a civilised nation. It accelerates the progress of a country in every sphere of national activity. The very democratic foundations of our nation, as enshrined in our Constitution, recognise the role and importance of education. Under our Constitution, the State is duty bound to develop a scientific temper, humanism, and the spirit of inquiry and reform as well as to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavor and achievement. None of these goals can be achieved or ensured except by means of education."

I am delighted to have been invited as the Chief Guest for the 40th Annual Convocation of Mangalore University by Professor P. Subrahmanya Yadapadithaya. I am honoured to have the opportunity of witnessing the conferral of degrees to so many young graduates of Mangalore University. Today marks a very important occasion, as today our country will begin to benefit from the fruits of labour of the exceptionally talented batch of students of this University who are graduating here. I am proud to note that in the past 4 decades, the University has grown into an expansive multidisciplinary institution.

On this important occasion of the University's 40 th Annual Convocation, I congratulate Smt. Hemavathi V. Heggade, Shri Harikrishna Punaroor and Shri Devdas Kapikad, who have been awarded Honorary Doctorate Degree by the Mangalore University. I also extend my best wishes and congratulations to the students, who are being awarded their degrees, as well as to their proud parents, their guides, their professors, faculty instructors and the entire staff at Mangalore University. Given that the nation is currently proudly celebrating Indian democracy, through the Azadi Ka Amrit Mahotsav to commemorate 75 years of Indian democracy and independence, I think it would be a suitable occasion to talk a little about the correlation between education and democracy.

Democracy has a very close relationship with education. The principles of democracy like liberty, equality, fraternity, dignity of the individual, co-operation, sharing responsibility etc. are the dimensions which deeply influence education. On the other hand, education at various stages and dimensions intrinsically motivates a democratic way of life. Democratic values or principles are applied to education to make it more effective, meaningful, relevant and useful. Similarly, without education democracy cannot be a success, as individuals of a civilized society are to know the rights and duties of citizens, if they are to function on a democratic pattern in their daily life. Democracy in order to be a reality, a way of life and a living style has to be introduced from the very beginning of education and its values practised in schools and colleges.

Education is the most direct path for building a democratic culture. Such a path requires an education that views teaching and learning as part and parcel of the same process, that allows for consensus building with room for dissent, that presents reality with all its problems and fosters critical thinking. A democratic education is one that is anchored in facts and data, and helps form opinions based on a respect for diversity in beliefs and values without losing sight of the common good. Education for democracy is much more than educating young people on the merits of representative democracy, rather it is premised on the need to form civic and ethical values in order to allow them to become free, informed and critically minded citizens, capable of acting responsibly to transform their environment.

Democracy has always found education as its greatest support and constant company. Without education, democracy has limited relevance and effectiveness, and without democracy education loses its meaning. Democracy and education hear a reciprocal relation and one cannot thrive without the other.

Democracy believes in giving freedom to the people. But if they are not educated, then their freedom may lead to anarchy and indiscipline. Economic self-sufficiency is also necessary for democratic education. There are some commonly accepted pre- conditions for success of education for democracy.

These include the following:

a. There should be economic betterment of the people. Democracy cannot be established or maintained if the basic needs of the people remain unfulfilled. The people may be prepared to forego their political freedom, if this freedom does not help to solve their problem of bread and butter.

b. The second pre-condition is the formation of an educated electorate. Democracy can function properly only when the people are educated and

are conscious of their rights and duties. Education provides people with the capacity for better judgement regarding right and wrong, just and unjust. Otherwise, a small group will assume the control over government of the state and begin to exploit the masses.

The basic aims of education for democracy are development of: i) a balanced and harmonious human personality; ii) building of character (moral and ethical development); and iii) training for an efficient and productive existence in a society or culture. It is imperative, therefore, that programmes and practices of educational institutions should be formulated in such a way that the objectives of education in a democratic society can be properly realized.

The development of a well-integrated and harmonious personality of an individual is essential in a democracy. Every student should be given a full chance to develop themselves as an individual personality so that they might be able to enjoy life through the exercise of their capacities and should be alive to the realities and possibilities of the world around them. They should know how to play their part as an active member of his community. They should be equipped adequately to contribute to society through their occupation. They should also know how to be in effective communication with their fellow- country men and women by articulation and creative activities.

Character building involves moral and ethical development of individuals. This means inculcation of human values such as honesty, sincerity, commitment and integrity. These are essential qualities for members of a democracy, and education has to develop these in individuals.

Since the students of today are the citizens of tomorrow, they need to be trained in citizenship for an efficient and productive existence in a democratic society or culture. This involves making judgements on complicated personal, economic, social and political issues and also contributing to society by way of work. To be effective, a democratic citizen should have the understanding and the intellectual integrity to sift truth from falsehood, and must develop a scientific attitude to think objectively and base his conclusions on tested grounds. He should also have an open mind responsive to new ideas and not confined within the prison walls of outmoded customs, traditions and beliefs. The development of the capacity for productive work is also an essential requirement of education for democracy.

In a democratic society, universities ought to stress the duties and responsibilities of individual citizens. They have to stress the importance of team work and the values of empathy, compassion and sharing, emphasis being on the good of the community. The true function of a university in a democracy, therefore, is to provide for the enrichment of individual life and the harnessing of individual innovation and excellence for the progress of the entire society. The university should help in developing the innate potentialities of children, and produce youth as disciplined, creative, sociable and cooperative members of the society.

The university, in order to discharge its responsibility for citizenship training and optimization of students' capabilities, has to function on democratic lines. The curricular and co-curricular activities should be organised in such a manner that all components of the system (the teachers, the students and the community) work as a coherent whole, and nobody feels left out or repressed. The university management and organisation have to be participatory. The methods of teaching should promote congenial discussion in a nurturing atmosphere. The evaluation techniques, methods and processes in the university have to be transparent, flexible objective and scientific.

The climate of university life and the dynamics of human relations, are important factors which pupils can learn about the way of life and values that influence their interpersonal relations and the all-round development of their personality. Learning experiences in universities make or mark the growth of democratic life. Education is not a preparation for life, education is life itself. University is not the replication of society, it is society itself.

The university sets out deliberately to devise the right environment for students, to allow them to be themselves and to develop in a way and pace appropriate to them. It tries to equalise opportunities and to compensate for handicaps. It lays special stress on individual discovery, on first-hand experience and on opportunities for creative work. It insists that knowledge must not fall into neatly separate compartments and that work and play are not opposites, but complementary. A student brought up in such an atmosphere at all stages of his education has some hope of becoming a balanced and mature adult and of being able to live to contribute to and look critically at society.

Today, in 2022, the pre-eminence of the knowledge society is undeniable. Education and education institutions are the building blocks of this knowledge society. Education plays a cardinal role in transforming a society into a civilised nation. It accelerates the progress of a country in every sphere of national activity. The very democratic foundations of our nation, as enshrined

in our Constitution, recognise the role and importance of education. Under our Constitution, the State is duty bound to develop a scientific temper, humanism and the spirit of inquiry and reform as well as to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement. None of these goals can be achieved or ensured except by means of education. It is well accepted by the thinkers, philosophers and academicians that if Justice, Liberty, Equality And Fraternity, including social, economic and political justice, the golden goals of the Constitution of India are to be achieved, our nation has to be educated and educated with excellence. Education is a national wealth which must be distributed equally and widely in the interest of creating an egalitarian society Thus, the role of education in sustaining our democratic values is undeniably crucial. In a democratic country, people elect their representatives to work for a quality life and inclusive growth opportunities for them. The quality of the public representatives, in turn, depends on the quality of the people who vote for them. So, the root cause of problems as well as solutions lies with the voters. They must be properly educated to choose their leaders.

University students around the globe are acutely aware that they are entering the professional world at a tenuous socio-political moment, as the resilience of democracies is tested and autocratic movements are on the rise. Regardless of which field students enter or which country they call home, it is imperative that the university experience prepares them with the habits of a healthy democracy. Students do not come into higher education with perfectly developed competences for democratic culture. And universities cannot just copy what has been developed for primary and secondary education. Higher Education students are older and presumably more mature than those at primary and secondary school, and most of them will be able to vote and exercise their full rights as citizens. They should also participate more fully in the governance of their institutions. Universities should not consider the job of educating active, critical citizens as done but as a job to be continued. In my view, there are a few broad strategies that Mangalore University and other Indian universities can adopt to inculcate democratic habits into their students:

Institutionalise Civic Internships

Colleges and universities can create a menu of civic internships by establishing relationships with local organisations and businesses. These partnerships should span a broad range of fields and public services, including newspapers and media, public agencies, local municipalities, public health and justice organisations, educational services etc. Such internships are opportunities for students to contribute to the civic functioning and real lives of the people in the wider community. Most critically, these should be standard offerings in a university curriculum – not extracurricular or additive electives. Civic internships should be available for credit and taken in lieu of other classes to encourage broad participation, equity across the student body, and real dedication. When universities have enough community partners to meet the needs of their student body, they can go a step further and make civic internships a requirement for graduation. Internships can be bolstered by a classroom component to provide context for student work and a shared sense of why this matters.

Reach Every Student (Democracy is not Just for political science students)

Every student of every stream and academic focus can graduate from university with an understanding of how their field may intersect with civic functions and democracy. It is no longer enough for civic internships to be limited to a small handful of liberal arts streams students. Universities should find inroads for students in science, business and fine arts to contribute to local or national efforts that affect people's lives and civic functions. This will require thinking more creatively about the internships that many universities have offered in the past. For example, where students of computer sciences may have previously focused their internship efforts on the tech sector, they could instead help small and underfunded municipal offices modernise their methods of communicating with residents. These experiences have great potential to help graduates think more expansively about how to apply their specialist knowledge and skills in the world.

Maximise Opportunities for Democratic Practices on Campus

University campuses are not pure democracies, but they are ripe environments for democratic decision-making in several areas. Many universities employ varying degrees of shared governance – the chance for faculty, staff and students to make decisions about how things operate and to take responsibility for their choices. Along those same lines, student governing bodies and associations are most impactful when they enjoy robust elections and they hold meaningful power in campus decision-making. All this requires that university leaders afford these groups real influence and not merely symbolic presence. Herein lies perhaps the most challenging mandate for universities that are serious about democratic practices: universities must welcome dissent, protest and criticism from their students. Fostering an environment where dissent

and discomfort can coexist with institutional order can elegantly reproduce the essential ingredients of a thriving society. It will help make students comfortable with the inherent tensions of democracies, with the necessity of speaking up and accepting fair but undesirable outcomes.

Encourage Civil Resistance

Engaged intellectuals embrace the role of leader and mediator rather than staying sequestered in faculty offices. In difficult times, we need academics who will articulate what democracy means and how to sustain it. Conversations about the nature of democracy and the university's role in fomenting discussion and enabling democratic engagement will mean that we need to think through how to resist those practices that subjugate democracy. I am calling for active engagement with society rather than the typical "ivory tower" approach.

Culture of Democracy in Study Programmes

Democratic values may be integrated into higher education as a single subject or course, across different curriculum subjects, or as a transversal theme incorporated into all or some disciplinary topics. However, democratic culture is not something to be taught two hours a week and forgotten for the rest of the time, nor is it a topic for "specialists" like political scientists or lawyers only. Providing competences for democratic culture needs to become an integrated part of how higher education sees itself. Examples of how this can be done include holding open workshops and events, inviting external stakeholder involvement in different courses, or engaging students in discussion of how their fields of study can contribute to a healthy democracy or to sustainable development. One very topical, if challenging, question would be how students believe they would have reacted had they been at a Ukrainian or Russian university. What leads academics to speak up at personal danger, and what leads them to conform and keep quiet? Situations vary considerably, but ground rules could include:

i) making sure that the classroom is a space where students openly discuss their views, even when these may be controversial;

ii) encouraging students to play an active role in their own learning;

iii) finding ways for faculty to work together to include teachings of democracy across study programmes and departments; and

iv) encouraging critical thinking, which includes not only "finding fault" with what exists but exploring alternative solutions.

Engaging the whole Institution and beyond

Democracy cannot be learned in theory alone or solely in the classroom. Institutions can practise what they teach by engaging students in the governance of the institution, from department level up. It is important that leaders and staff encourage students to make the most of the possibilities that exist. Everyone cannot be elected but everyone can engage with their representatives. Education for democratic culture is part of the mission of higher education. It is for all students and staff, not just "specialists". We can all be challenged to think about what our own discipline can do and how we would react if democracy were taken away from us. Students should engage in the life of the institution as well as in the life of their local community, such as through work with schools, charities and other civic organisations.

As dedicated centres for the study of democracy sprout up around the world – which are exciting, necessary and inspiring initiatives, to be sure – universities must also dedicate themselves to living these values, embedding them in the student experience, and providing students with tangible opportunities to appreciate their impact. With attention to these practices today, we can empower the next generation of leaders in every field to usher in a more democratic future.

Finally, I would call upon the graduating students to reflect upon all that we have discussed here today. I want to ask all of you, what is your contribution going to be in furthering our nation's democracy? What will future chief guests, who come here 20 or 50 years later, say about the contribution of Mangalore University for strengthening Indian democracy? Where will you and the university stand when our nation's Azadi Ka Amrit Mahotsav reaches its centenary and beyond?

I am confident that during your time here at Mangalore University, you have had time to reflect upon these questions and choose your own path. I believe that that the seeds of achieving this goal of self-reliance have already been sown at Mangalore University. The achievements of the University over the past 4 decades are commendable and aligns perfectly with the democratic ideals of our beloved nation.

I am grateful to Vice Chancellor Professor P. Subrahmanya Yadapadithaya for inviting me to this seminal event. I congratulate and extend my best wishes to all the students with the strong belief that their knowledge, expertise and potential would be immensely helpful to the progress of our country. I conclude by thanking the families and teachers of the graduating students for supporting this group of immensely talented students.

Thank You, Jai Hind. ❑

CAMPUS NEWS

National Webinar on National Education Policy–2020 and Indian Higher Education

A two-day National Webinar on 'National Education Policy–2020 and Indian Higher Education: A Way Forward' was organized by the Department of Teacher Education, Nagaland University (NU), Kohima Campus, Meriema, Nagaland, recently. The event was sponsored by ICSSR, NERC, Shillong. The Chief Patron of the event was Vice Chancellor, Prof. Pardeshi Lal, Patron was the Pro-Vice Chancellor, Prof. N Venuh and Co-patron was the Dean, School of Humanities and Education, Nagaland University, Nagaland. The Coordinator of the event was Dr. P K Pattnaik, Head, Department of Teacher Education, Nagaland University, Dr. Surender Yadav, Assistant Professor, Department of Teacher Education, Nagaland University was the Convener of the event.

The Inaugural Session was moderated and chaired by Dr. T Yolila Sangtam, Assistant Professor, Department of Teacher Education, Nagaland University. Dr. Pradipta Kumar Pattnaik, Head, Department of Teacher Education, NU delivered the welcome address, while Dr. Surendra Yadav, Assistant Professor, Department of Teacher Education, Nagaland University presented the opening remarks of the Webinar. He highlighted the subthemes of the event i.e. Quality of Higher Education: Challenges and Solutions; Equity and Inclusion in Higher Education and Teacher Education; Vocationalisation of Higher Education; and Use of Technology in Teaching, Research, Evaluation and Governance. He further mentioned that the success and failure of NEP-2020 can be determined by its implementation. Therefore, it is important to discuss how far the policy implementation process has been carried out in the last two years.

The Chief Guest, Prof. Bhagirathi Panda, Director, ICSSR, NERC, Shillong, in his speech emphasized the importance and relevance of NEP-2020 at the global level. Globalization of education particularly at the Higher Education level is stressed, in order to bring about changes in values and practices in the knowledge economy. This can be brought about by addressing the challenges such as increasing the Gross Enrolment Ratio, improving the student-teacher ratio, Indigenization of Higher Education, and access to inclusiveness and research. He emphasized that for a successful NEP-2020, there is a need to collaborate between Government, Market, Community, and Civil Society.

The Guest of Honour, Prof. N Venuh, Pro-Vice Chancellor, Nagaland University, Kohima Campus, in his address emphasized the need to be realistic and practical while implementing the NEP-2020 policies and goals, taking into consideration the social, cultural, geopolitical, economic challenges and issues. To upgrade quality in Higher Education, he encouraged research studies and utilization of available resources.

The Keynote Address was delivered by Prof. C B Sharma, IGNOU, New Delhi. He highlighted that there is a complete break between School Education and Higher Education. Bridge, this gap is one way forward to improving Higher Education. He emphasized the need for autonomy in the institutions for its improvement in quality.

The Technical Session on 'Quality of Higher Education: Challenges and Solutions' was moderated and chaired by Prof. G N Tiwari, Department of Teacher Education, Nagaland University. In the session, Resource Person, Prof. Ramesh Kothari, Former Vice Chancellor, Veer Narmad South Gujarat University, Surat highlighted the weaknesses of higher education such as limited resources, financial disparities due to privatization of institutions, no single yardstick for quality assessment, etc. One of the major challenges of NEP-2020 is the complete overhaul of teacher education and re-energizing of higher education. He deliberated on the multi-disciplinary education system as proposed by NEP-2020, the role of the National Higher Education Regulatory Council (NHERC), National Research Foundation (NRF), Choice Based Credit System (CBCS), grading system, extension work, need for campus placement cell and open distance learning as important aspects for improvement in quality and quantity in Higher Education. A few solutions were also suggested such as the incorporation of seminar-based classes, 15 weeks of compulsory teaching,

research culture, and autonomy of institutions. At the end of the session, ten participants presented their papers under this subtheme. In the concluding remarks, Prof. Ramesh Kothari suggested including and contributing toward vocational education, Choice Based Credit System, and a grading system in the discussions.

The Technical Session on 'Equity and Inclusion in Higher Education and Teacher Education' was moderated and chaired by Dr. M Rajendra Nath Babu, Assistant Professor, Department of Teacher Education, Nagaland University. In the session, Recourse Person, Prof. S K Yadav, Former Head, Department of Teacher Education, NCERT, New Delhi deliberated on the 'Importance of Education as the Only Instrument for the Development of Society'. In order to adopt inclusiveness, several suggestions were recommended such as access to opportunities; equity to all sections of society; quality in research as well as training quality teachers; affordability to all sections of the society; and curriculum to be inclusive in school education, higher education, and teacher education. He discussed in detail the structure of Teacher Education as per NEP-2020. For Pedagogy, he emphasized hands-on experience, storytelling, art integrated and sport-integrated pedagogy. At the end of the session, eleven papers were presented and discussed by the presenter on the subtheme of the session.

The Session on 'Vocationalisation of Higher Education' was moderated and chaired by Dr. Rashmi, Assistant Professor, Department of Teacher Education, Nagaland University**.** The Resource Person, Kalpana Kaushik, Director (I/c) Indian Adult Education Association, New Delhi expressed her views on Vocationalisation of Education in Higher Education with reference to NEP- 2020. The speaker also highlighted the aims, recommendations, and provisions of NEP-2020 on vocationalisation of education. She also emphasized the worldwide data on vocational education and the role and responsibilities of the Ministry of Education, Ministry of Labor and Employment and Ministry of Skill Development and Entrepreneurship as an agency for the implementation of vocational education in the country. At the end of the session, eleven papers were presented and discussed with the presenter on the topic.

The Session on 'Use of Technology in Teaching, Research, Evaluation and Governance' was moderated and chaired by Dr. Surendra Yadav, Assistant Professor, Department of Teacher Education, Nagaland University. Prof. P.K. Mishra, Director, CPRHE, NIEPA, Resource Person for the session emphasized the use of technology in teaching, research, assessment and governance. He stressed the importance of the efficiency of using technology among individuals. At the end of the session, fourteen papers were presented and discussed by the presenter and participants.

The Valedictory session was moderated and chaired by Dr. Pradipta Kumar Pattnaik, and the valedictory address was delivered by Dr. Amarendra Pani, Joint Director and Head (Research Division), AIU, New Delhi. In his valedictory speech, he highlighted the journey of education from the Mudaliar Commission (1952) to the Kothari Commission (1964), NEP (1986), NEP (1986), Acharya Commission (1990), Programme of Action (1992), Yashpal Commission (2005) and National Commission (2006-2007). The speaker also remarked that UNESCO (1972) brought about innovation and transformation in the educational system of India. However, the country felt that these policies are outdated and needed a new policy for the changing need of the time which led to the introduction of the National Educational Policy (NEP, 2020). He emphasized that individuals now need not only the Intelligent Quotient and Emotional Quotient but also the Spiritual Quotient. With the internationalization of education, there is a need for adaptability, adjustability, and employability among students of higher Education. Asale Vitso and Thronlem Jorlim Konyak, research scholars, Department of Teacher Education, Nagaland University presented a brief report of the entire two days of the national event.

Prof. G N Tiwari, Department of Teacher Education, NU delivered the vote of thanks to all, in his address recognizing the significance of the event, Prof. Tiwari thanked the Coordinator and Convener of the webinar for successfully organizing the event. Gratitude was also extended to the Pro-Vice Chancellor, Nagaland University, Kohima campus, Prof. N Venuh and to all the resource persons, paper presenters, and participants for their active and valuable participation. Also, thanked ICSSR, NERC, Shillong, Meghalaya for giving me the opportunity to organize the webinar.

National Seminar on Buddhism and Sectarian Religious Faiths

A two-day National Seminar on 'Buddhism and Sectarian Religious Faiths in India' is being organized by the Centre for Mahayana Buddhist Studies Acharya Nagarjuna University during March 01-02, 2023.

The contemporary interest in Buddhism is based on its social appeal. Within India, Buddhism has appeared as an alternative to the hierarchical and egalitarian ideology and Hinduism. Buddhism is viewed as a system that was more sympathetic to oppressed groups and a social solution to the problem of caste oppression. After the pioneering work of Dr. Ambedkar on the social philosophy of Buddha some scholars like Eleanor Zelliot (1992), Uma Chakravarthi (1996), Rhys Davids(1997), Gail Omvedt, and others worked on the social dimensions of Buddhism.

Though Buddhism was defeated and erased physically from its birthplace, it is surviving in several forms of faiths and cults. Buddhist thought has been perpetuated in the form of local religious traditions and customs. The rise of different sectarian religious movements during the medieval and late medieval periods in India carried forward the anti-caste and non-vedic philosophical notions of Buddha. Those sectarian leaders rejected Vedic Brahmanism and propagated egalitarian ideas within the framework of the religion. Siddha tradition in South India evolved out of the Buddhist school of Vajrayana was more prevalent among the lower strata, and strived to attain equality in the religious sphere. Many Siddha cult centers of present Andhra and Telangana states including *Siddhavatam, Siddeswaram, Siddula Guttalu,* etc. are live examples of this phenomenon. The medieval text (14-15 C.E) in couplet form *'Navanadha Charitra'* written by *Gourana* also mentioned the Siddhas.

Similarly, Vaishnavism also propagated social equality during the medieval period. Ramanuja had admitted lower castes into his Vaishnava fold and mentored them as Maladasu and Madigadasu. Dasari community has emerged among the lower castes as one of the influential inter sub-caste, maintaining some sort of high rank as a priestly class within the same group. Brahmanaidu, a medieval social reformer and staunch follower of Vaishnava cult has organized inter-dining among different communities and gave priority to Mala Kannamadasu, the army commander from the lower community. Evolution of Chennakesava cult among the lower castes witnessed this phenomenon. It is interesting to note that the priests of the Chennakesava temples were appointed from the Mala community.

Saint Ravidas, Kabir, Chokkamela, Shima Boi, and others from North India also framed anti-caste and non-Brahmine philosophy. A woman saint Meerabai and her Bhakti is also considered to be an anti-hegemonic philosophy. Similarly, there are many social reformers in Telugu-speaking regions. Philosophers from Sudra communities such as Pothuluri Virabrahmam, Yogi Vemana and others revolted against the hypocrisy of Brahmanism in Andhra. There are many spiritual leaders at the local level including Nasarayya,Dunna lddasu, Yadla Ramadasu, and others who rejected Vedic Brahmanism and promoted spiritual democracy. There are Sufi saints who emerged from a Muslim background and also propagated equality among all sections of society. Dargas are the centers that acted for social harmony, integrated all communities, and strived for unity among Hindu and Muslim groups. The Subthemes of the Event are:

- Buddhism- Buddhist Anti-caste Philosophy.
- Vajrayana/ Siddha Cults in South India.
- Sectarianism – Medieval Bhakti Movements and Anticaste Philosophy.
- Virasaivism- Basaveswara, Akkamahadevi, Panditaradhya.
- Vaishnavism -Ramanuja, Brahmanaidu.
- Pothuluri Virabrahmam- Vemana.
- Nasarayya- Dunna lddasu- Yadla Ramadasu.
- Sufi Saints.
- Tukaram- Sant Ravidas- Chokkamela.
- Meerabai- Kabir- Shima Boi.
- Any Other Relevant Theme.

For further details, contact Prof. Ch. Swaroopa Rani, Centre for Mahayana Buddhist Studies, Acharya Nagarjuna University- 522510, Phone No:09440362433, E-mail: *anu.cmbs@gmai.lcom.* For updates, log on to*: www.nagarjunauniversity.ac.in*

Capacity Building Program for Young Social Science Faculty Members

A twelve-day Capacity Building Programme for Young Social Science Faculty Members is being organized by the Chaudhary Ranbir Singh University Jind, Haryana during February 20 – March 03, 2023. The programme is sponsored by the Indian Council of Social Science Research (ICSSR), New Delhi.

Capacity building and personality development have become key requirements for survival in today's global environment, particularly in academia, where advancements have become more dynamic than previously. In the social sciences, research has become so important to faculty members that professional progress without it is nearly impossible. The inclusion of this feature in the new national education policy, 2020, has increased the value of social science research. Given the importance of capacity building programmes in academics, it has become necessary to use this as an opportunity to strengthen our affirmative action policies in higher education by organising such training with a priority for young faculty (regular/ad hoc/contractual). In light of the current pandemic situation, the training programme will be conducted in an offline format, which will provide a conducive safe environment for learners and resource persons to participate in this academic exercise with safety measures during the workshop. The main themes of the programme are:

- Research Technique, focusing on social research methodology
- Developing research instruments and determining the best strategy for conducting qualitative research.
- Working with quantitative data or doing quantitative social research using statistical tools.
- Writing research proposals in order to obtain minor/major projects from various funding bodies interested in social research promotion.

For further details, contact Course Director, Prof (Dr.) S K Sinha, Dean and Chairperson, Faculty of Commerce and Management, Chaudhary Ranbir Singh University, Jind-126102 (Haryana), Mobile No.: 09416382552, E-mail: *sksinhacrsu@gmail.com* / *icssrcb2022@gmail.com* For updates, log on to: *www.crsu.ac.in.*

AIU News

ANVESHAN-West Zone Student Research Convention

The Association of Indian Universities in collaboration with Ajeenkya D Y Patil University, Pune, Maharashtra hosted *ANVESHAN* - West Zone Student Research Convention during January 10-11, 2023. More than 100 students from twenty-three universities from the states of the western region of India participated in the event. A total of 62 innovative projects were showcased by students and their mentors which got recorded as one of the highest participations in the history of *ANVESHAN* organized for Western Zone to date. Projects showcased in the event were indeed exemplary and expected to have a significant impact on society and also enhance Indian academic research in the international academic landscape.

The inauguration ceremony commenced during the morning hours in the Ajeenkya DY Patil University auditorium on 10th January 2023. The ceremonial dais was honored by the august presence of Prof. Hrridaysh Deshpande, Vice Chancellor, Ajeenkya DY Patil University as the Patron-in-Chief, Air Vice Marshal Dr. Rajesh Vaidya, VSM, Dean and DY Commandant, Armed Forces Medical College (Pune) as a Chief Guest, Dr. Dattatray Jadhav, Joint Director, DTE Maharashtra Chief Guest, Dr. Usha Rai Negi, Assistant Director, Research Division, AIU, as the Guest of Honour and Dr. Biswajeet Champaty, Dean, School of Engineering ADYPU, and Convener for the West Zone Students' Research Convention *ANVESHAN,* 2022-23.

Dr. Biswajeet Champaty, in his welcome speech, introduced the concept of *ANVESHAN*- West Zone SRC-2023 and expressed that he was feeling indeed thrilled to be selected by AIU to host the prestigious student research-driven event dedicated to the promotion of innovation through the power of interdisciplinary research.

Prof. Hrridaysh Deshpande, Vice Chancellor

welcomed the gathering and felicitated the dignitaries. In his inaugural speech, Prof. Hrridaysh Deshpande shared thought-provoking ideas to students to pursue interdisciplinary research to deal with societal problems with innovative solutions and form communities of practice and become lifelong learners.

Dr. Usha Rai Negi, Assistant Director, AIU gave a brief background of *ANVESHAN*, an annual flagship student research convention that includes the spirit of research culture in Higher Education Institutions (HEIS) to promote the box ideas in diverse fields ranging from Agriculture, Engineering, Health and Social Sciences to solve contemporary societal and technological challenges. The winning proposals from each zonal region shall compete for the national level competition to be held tentatively during mid of March this year. The Research division of AIU as part of capacity-building activities regularly organizes various seminars and conferences for strengthening Indian higher education. It also takes up research projects and recommends policies for higher education to the Ministry of Education, Govt. of India.

The inaugural session was graced by Air Vice Marshal Dr. Rajesh Vaidya, VSM, Dean and DY Commandant, Armed Forces Medical College (Pune), Dr. Dattatray Jadhav, Joint Director, DTE, Maharashtra. They motivated the students to take up innovative research projects and contribute to India's startup ecosystem as well as nation-building. They emphasized research at both grass-root and multidisciplinary levels to make India an innovation hub of the 21st century. They further stressed that *ANVESHAN* is a unique platform for budding scientists. The participants should interact among and up-skill themselves to thrive in this fast-changing complex society.

Dr. Raj Gaurav Mishra, Coordinator, West Zone *ANVESHAN* thanked all the participants and student volunteers for their enthusiastic participation.

Following the Inauguration, the first round of assessment of the research projects started wherein the student researchers presented the 62 registered projects as posters in the prescribed format. Subject experts evaluated the participating projects in concerned areas based on stipulated parameters and after a thorough examination, all of the registered projects were allowed for the next round of evaluation through Podium Presentation. The objective of the second round was to understand in-depth details pertaining to projects on evaluation parameters such as scientific principles, creativity, relevance, thoroughness, cost-effectiveness, teamwork, and skill. In the podium round, shortlisted projects were presented in front of judges through power point presentations followed by question-answer sessions.

Keeping in mind the excellence and usefulness of the various research projects presented in the convention during the two days, jury members and distinguished evaluators scrutinized and declared first, second and third prizes in different subject areas. Winners were awarded the mementos and certificates in the valedictory ceremony that were overseen by Dr. Usha Rai Negi, Assistant Director, AIU. All the winners were invited by Dr. Usha Rai Negi to present their research in the upcoming Anveshan National Student Research Convention be organized under the aegis of AIU which is scheduled in the month of March 2023 at Ganpat University, Mehsana, Gujarat.

During the Valediction Ceremony, Dr. Sanjay Nibandhe, Deputy Director, ARAI was the Chief Guest. Other dignitaries present on the podium were Prof. Hrridaysh Deshpande, Dr. Usha Rai Negi and Dr. Biswajeet Champaty. Dr. Sanjay Nibandhe delivered the keynote speech as the Chief Guest and talked about the importance of patent and Intellectual Property Rights for researchers and Universities. Prof. Hrridaysh Deshpande, and Dr. Sanjay Nibandhe felicitated the jury members. Dr. Biswajeet Champaty, Convener of the West Zone *ANVESHAN,* announced the names of fifteen winners for the National level competition which will take place in the mid of March, 2023. All participants received certificates of participation and the winners received special certificates of merits and mementos.

The concluding address was delivered by Dr. Usha Rai Negi. She lauded the efforts of the host university, providing ample opportunities for the youth to explore the prestigious event. She appreciated all the team members of the Organizing Committee of Ajeenkya DY Patil University for successfully organizing *ANVESHAN* on their esteemed campus. She expressed her sincere thanks to all the people who directly or indirectly supported in making the event a huge success.

Given below are the details of the winning projects selected from the West Zone:

Category: AGRICULTURE

Code No.	Participants	Institute Name	Name of the Project	Position
AG-4	Niraj Deepak Pawar	Kavayitri Bahinabai Chaudhari North Maharashtra University	Banana Leaf Disease Detection System Using Artificial Intelligence	1st
AG-1	Yashkumar Panchal, Meet Patel, Ayush H. Patel	Ganpat University	Aerotuber: Potato Seed Production through Aeroponics	2nd
AG-7	Rohan Choudhary, Raut Ankita	University of Mumbai	Novel in Situ Bandage for The Treatment of Digital Dermatitis in Cattle	3rd

Category: BASIC SCIENCES

Code No.	Participants	Institute Name	Name of the Project	Position
BS-3	Paresh Patil	University of Mumbai	Innovative Method for Recycling of Outdated of Lithium-ion batteries for Circular Sustainable Development	1st
BS-5	Adhiraj Mulay, Madhu Singh	MGM, Navi Mumbai	Low Cost India Specific Vacuum Dressing System	2nd
BS-7	Amit Khandebharad, Syed Azhar Siddique	MGM University, Aurangabad	Secure Threat- An Online Intrusion Detection System (IDS)	3rd

Category: ENGINEERING AND TECHNOLOGY

Code No.	Participants	Institute Name	Name of the Project	Position
ET-2	Omkar Komarpant, Aman Hanspal, Praful Kadam	DY Patil University	ThirdEye: AR Glasses for Security	1st
ET-19	Vishal Palnekar, Sayali Tawhare, Nidhi Shetigam	University of Mumbai	URSA- User Driven Realtime Surveillance Analytics	2nd
ET-18	Sanket Pawar, Pranav Kakade, Deepanshu Sharma	MGM University, Aurangabad	Tongue Operated Wheelchair	3rd

Category: HEALTH SCIENCE AND ALLIED SCIENCES

Code No.	Participants	Institute Name	Name of the Project	Position
HS-15	Sanket Shirodkar	University of Mumbai	Triad Therapy, A Chrono Pharmacology Based Holistic Approach To Treat Non-Alcoholic Steatohepatitis (Nash)	1st
HS-9	Sopan Namdev Nangare	H. R. Patel Institute of Pharmaceutical Education and Research, Shirpur	Fabrication of Surface Decorated Graphene Oxide Nanocomposites for Label Free Prognosis of Alzheimer's Disease	2nd
HS-4	Bhumika Adsul	MGM University, MUMBAI	Development of a Video-graphic Two-dimensional method for Evaluating Movements of Temporomandibular Joint	3rd

Category: SOCIAL SCIENCE

Code No.	Participants	Institute Name	Name of the Project	Position
SS-11	Swaraj Mishra	University of Mumbai	TRADEX - Personal Intraday Stock Advisor	1st
SS-8	Tuba Kazi, Tejas Ghangade	D.Y. Patil, Deemed to be University, School of Management	Skill Development Programs for Improving Livelihood	2nd
SS-5	Yashwardhan Desale, Siffat Chhabda, Chintanpreet Sodhi	MGM University, Aurangabad	Doughful Cutlery	3rd

THESES OF THE MONTH

SCIENCE & TECHNOLOGY
A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of Nov-Dec, 2022)

AGRICULTURAL & VETERINARY SCIENCES

Dairy Science & Technology

1. Honkar, Amol Shivraj. **Preparation of soya milk blended channa based sweetmeats by using natural coagulants**. (Dr A S Hembade), Faculty of Science and Technology, Swami Ramanand Teerth Marathwada University, Nanded.

BIOLOGICAL SCIENCES

Biotechnology

1. Joshi, Ila. **In vitro and in vivo anti-inflammatory effects of molluscan derived peptides and its assessment in the regulation of inflammatory mediators**. (Dr R A Nazeer), Department of Biotechnology, SRM University, Kattankulathur, Chennai.

Botany

1. Rakesh, B. **Biotechnological approaches for the in-vitro production of I-DOPA from callus suspension cultures of mucuna pruriens (I.) DC**. (Dr. Praveen N), Department of Botany, Christ University, Bangalore.

Zoology

1. Pathi, Chandra Shekar. **Limnological study of Mothe River Jagtial District Telangana State**. (Dr. H L Tamlurkar), Department of Zoology, Swami Ramanand Teerth Marathwada University, Nanded.

ENGINEERING SCIENCES

Biomedical Engineering

1. Haripriya, Bhargavi. **Self monitoring for pre-evaluation of diabetic foot ulcer using thermal imaging**. (Dr.K A Sunitha), Department of Biomedical Engineering, SRM University, Kattankulathur, Chennai.

Civil Engineering

1. Thiagarajan, K. **Effect of loading rates on pullout performance of pre-coated steel fibers embedded in treated rubber concrete**. (Dr. N Umamaheswari), Department of Civil Engineering, SRM University, Kattankulathur, Chennai.

2. Vimalanandan, G. **Axial compressive and buckling behaviour of GGBS concrete infilled light gauge steel tubes**. (Dr S Senthil Selvan), Department of Civil Engineering, SRM University, Kattankulathur, Chennai.

Computer Science & Engineering

1. Bhalerao, Pramod Baburao. **Approach for automated detection and classification of masses in mammographic images**. (Dr. Sanjiv V Bonde), Department of Computer Science & Engineering, Swami Ramanand Teerth Marathwada University, Nanded.

2. Balachander, T. **Cognitive radio synchronized reliable cooperative spectrum sensing using Non-Orthogonal Multiple Access (NOMA) for 5G wireless communication**. (Dr.M.B.Mukesh Krishnan), Department of Computer Science & Engineering, SRM University, Kattankulathur, Chennai.

3. Darak, Mahesh Shyamsunder. **Machine learning approaches for crop leaf disease detection and classification**. (Dr. Nilesh K Deshmukh), Department of Computer Science, Swami Ramanand Teerth Marathwada University, Nanded.

4. Nagadevi, S. **Design and development of efficient multi-coreaware virtual machine placement algorithms for cloud data centers**. (Dr. S V Kasmir Raja), Department of Computer Science & Engineering, SRM University, Kattankulathur, Chennai.

5. Sharma, Durga Satyanarayan. **Advanced algorithms for three dimensional visualization of geospatial data**. (Dr. Nilesh K Deshmukh), Department of Computer Science, Swami Ramanand Teerth Marathwada University, Nanded.

6. Subash, R. **Reinforced trustworthy paradigm for managing smarter devices in social Internet of Things**. (Dr. R. Jebakumar), Department of Computer Science & Engineering, SRM University, Kattankulathur, Chennai.

7. Sunilkumar, P. **Development of algorithms for two warehouse inventory models using soft computing techniques**. (Dr. Rajendra Prasad Mahapatra), Department of Computer Science & Engineering, SRM University, Kattankulathur, Chennai.

8. Usharani, R. **Predictive analysis of progression**

of type 2 diabetes mellitus neuropathy patients to nephropathy using machine learning techniques. (Dr. A. Shanthini), Department of Computer Science & Engineering, SRM University, Kattankulathur, Chennai.

Electrical & Electronics Engineering

1. Sivasubramanian, M. **Power quality issue mitigation using switched capacitor based ANPC inverter topology and RBFNN based reference current generation**. (Dr. C S Boopathi), Department of Electrical & Electronics Engineering, SRM University, Kattankulathur, Chennai.

2. Uthra, R. **DVR and EV charger based voltage support for LVRT in grid connected wind / PV system**. (Dr. D. Suchithra), Department of Electrical and Electronics Engineering, SRM University, Kattankulathur, Chennai.

Electronics & Communication Engineering

1. Anitharaj, N. **Investigation of plasmonic nanoclusters for electromagnetic near field enhancement using FDTD method**. (Dr.P.Aruna Priya), Department of Electronics & Communication Engineering, SRM University, Kattankulathur, Chennai.

Food Science & Engineering

1. Kulkarni, Seema A. **Fabrication of banana stem fibre reinforced composite packaging material with essential oils to control postharvest diseases in twobanana (Musa Spp) cultivars**. (Dr.S Periyar Selvam), Department of Food and Process Engineering, SRM University, Kattankulathur, Chennai.

Mechanical Engineering

1. Srinivasan, K P. **Design, development and performance analysis of AgNP based capacitive flexible printed sensors for automotive infotainment bezel**. (Dr.T.Muthuramalingam), Department of Mechatronics Engineering, SRM University, Kattankulathur, Chennai.

2. Vinoth, A. **Design and development of hybrid UHMWPE composites for HIP implants**. (Dr. Shubhabrata Datta), Department of Mechanical Engineering, SRM University, Kattankulathur, Chennai.

Textile Technology

1. Dhavale, Atul Jagannath. **Development of nonwovens for air filtration**. (Dr. R N Joshi), Department of Textile Engineering, Swami Ramanand Teerth Marathwada University, Nanded.

1. Jawale, Sagar Noushad. **Characterization of suiting fabric produced by ring and compact yarn**. (Dr. R N Joshi), Department of Textile Technology, Swami Ramanand Teerth Marathwada University, Nanded.

MATHEMATICAL SCIENCES

Mathematics

1. Birajdar, Shivprasad Prabhu. **Some fixed point theorems in generalized metric spaces and it's applications**. (Dr. S S Zampalwad), Department of Mathematics, Swami Ramanand Teerth Marathwada University, Nanded.

2. Chavan, Ashwinkumar Raosaheb. **Application of fixed point theorems to differential integral equations in metric space and banach space**. (Dr. Uttam P Dolhare), Department of Mathematics, Swami Ramanand Teerth Marathwada University, Nanded.

3. Joshi, Prajakta Bharat. **Studies on color energy and its variations in graph**. (Dr. Mayamma Joseph), Department of Mathematics, Christ University, Bangalore.

4. Meghana, J. **Modulated rayleigh-benard ferroconvection in couple stress fluid**. (Dr. Pranesh S), Department of Mathematics, Christ University, Bangalore.

5. Thomas, Ellumkalayil Merlin. **A study on defective colouring of graphs**. (Dr. Sudev N K), Department of Mathematics, Christ University, Bangalore.

6. Thriveni, K. **Study on nonlinear convective flow of hybrid nanofluids in annulus**. (Dr. Mahanthesh B), Department of Mathematics, Christ University, Bangalore.

MEDICAL SCIENCES

Anatomy

1. Sundarapandian, S. **Effect of gamma sterilization on gymnema sylvestre leaf extract infused polycaprolactone nanofiber for effective wound dressing applications**. (Prof. Kantha Deivi Arunachalam), Department of Anatomy, SRM University, Kattankulathur, Chennai.

Biotechnology

1. John, Sherin. **Antigenotoxic potential of gymnema sylvestre against uranium induced toxicity in human peripheral blood mononuclear cells**. (Dr. P. Balakrishna Murthy and Prof. Kantha Deivi Arunachalam), Department of Biotechnology, SRM University, Kattankulathur, Chennai.

2. Rajapriya, P. **Investigation of emerging tumour markers in hepatocellular carcinoma with emphasis on clinical utility**. (Dr. S. Sundaresan), Department of Biotechnology, SRM University, Kattankulathur, Chennai.

3. Sarkar, Purabi. **Theurapeutic applications of peptide obtained from spirulina, arthrospiraplatensis cultured under sulfur deprived condition**. (Dr.A.Jesu Arockiaraj), Department of Biotechnology, SRM University, Kattankulathur, Chennai.

4. Stefi, Raju V. **Discovery and validation of bioactive peptides from teleost immune proteins, their antimicrobial response and possible pharmaceutical applications**. (Dr.Jesu Arockia Raju), Department of Biotechnology, Saurashtra University, Rajkot.

5. Vignesh, S. **Safety evaluation of cerium oxide nanoparticles using wild-type and transgenic drosophila melanogaster model of Alzheimer's disease**. (Dr. S. Sahabudeen), Department of Biotechnology, SRM University, Kattankulathur, Chennai.

Pharmaceutical Science

1. Shanthakumar, B. **Design, synthesis and biological evaluation of small bioactive heterocycles as antituberculosis agents**. (Dr.M.K.Kathiravan), Department of Pharmacy, SRM University, Kattankulathur, Chennai.

PHYSICAL SCIENCES

Chemistry

1. Jebaslinhepzybai, B. **Development of efficient electrocatalysts for Hydrogen Evolution Reaction (HER) over a wide pH range**. (Dr. J. Arockia Selvi), Department of Chemistry, SRM University, Kattankulathur, Chennai.

2. Kadam, Kailas Rajaram. **Development of novel methods for the synthesis of fine chemicals and bio-active compounds**. (Dr. V T Kamble and Dr. D S Wankhede), Department of Chemistry, Swami Ramanand Teerth Marathwada University, Nanded.

3. Maiyelvaganan, K R. **AB initio and density functional theory studies on interfacial interactions between molecular ions and carbonaceous surfaces**. (Dr. M. Prakash), Department of Chemistry, SRM University, Kattankulathur, Chennai.

4. Mathew, Agnus T. **Modified carbon substrates for electrocatalytic oxidation of selected heterocyclic carbinols**. (Dr. Anitha Varghese), Department of Chemistry, Christ University, Bangalore.

5. Pandey, Manju. **Spectroscopic studies and theoretical analysis of some selected heterocycles**. (Dr. N M Nanje Gowda), Department of Chemistry, Christ University, Bangalore.

6. Rison, Sherin. **Modified carbon based electrodes for electrochemical sensing of biomolecule**. (Dr. Anitha Varghese), Department of Chemistry, Christ University, Bangalore.

7. Singh, Pratiksha Chandrasen Singh. **Synthesis, characterization and application of edible polymer derived from renewable resources**. (Dr. O S Yemul), Department of Chemistry, Swami Ramanand Teerth Marathwada University, Nanded.

8. Subasree, N. **Synthesis and investigation of ionic salts and liquids as corrosion inhibitor for mild steel in acidic medium**. (Dr. J Arockia Selvi), Department of Chemistry, SRM University, Kattankulathur, Chennai.

9. Thomas, Anoopa. **Ionic liquids impregnated zifs for selective gas storage and separation: A multi-scale modelling approach**. (Dr. M Prakash), Department of Chemistry, SRM University, Kattankulathur, Chennai.

10. Vasanthi, P. **Modulating pharmaceutically relevant properties of a few active pharmaceutical ingredients: From crystal structure to function**. (Dr. Palash Sanphui), Department of Chemistry, SRM University, Kattankulathur, Chennai.

Nano Technology

1. Joseph, Dona. **Investigation on thermoelectric properties of layered chalcogenide materials for midtemperature applications**. (Dr. M. Navaneethan), Department of Nanotechnology, SRM University, Kattankulathur, Chennai.

Physics

1. Aadhityan, A. **Spin-dependent and spin-independent electron transport properties of isomers for molecular electronics and spintronics applications**. (Dr.C.Preferencial Kala), Department of Physics, SRM University, Kattankulathur, Chennai.

2. Aravindhavel, A. **Studies on the characteristics of the tropospheric aerosols and its long-term impacts**. (Prof D Narayana Rao and Dr. Sanjay Kumar Mehta), Department of Physics, SRM University, Kattankulathur, Chennai.

3. Prakash, J. **Investigation on graphene oxide nanocomposite incorporated chitosan patch for enhanced wound healing**. (Dr. G. Devanand Venkatasubbu), Department of Physics, SRM University, Kattankulathur, Chennai.

4. Roy, Arun. **Optical and infrared studies of herbig Ae/Be stars**. (Dr. Blesson Mathew), Department of Physics, Christ University, Bangalore. ❑

Adat Vyapari Education Society's Degloor
Degloor College, Degloor
Tq. Degloor, Dist. Nanded

WANTED

Applications are invited from the Eligible candidates for the following post in **Adat Vyapari Education Society's Degloor College**, Degloor, Tq. Degloor, Dist. Nanded (Granted). The applications duly completed should reach to the following address **within 15 days** from the date of advertisement. The candidates of reserve category should submit their copy of application to the **Assistant Registrar, Special Cell, S.R.T.M.U., Nanded.**

Sr. No.	Subject	No. of Vacancy	Reservation
1.	Botany	01	OBC
2.	Commerce	01	Open

Permission as per NOC No. : JDHE/NANDED/NOC/2019.

Educational Qualification :- (Assistant Professor)

1. Minimum educational qualification for the Post of **Assistant Professor** will be as per Regulation of UGC (2018), G.R. of Govt. of Maharashtra Dt. 08 March 2019.
2. A Master's degree with 55% marks (or an equivalent grade in a point-scale wherever the grading system is followed) in a concerned/relevant/allied subject from an Indian University, or an equivalent degree from an accredited foreign university.
3. Besides fulfilling the above qualifications, the candidate must have cleared the National Eligibility Test (NET) conducted by the UGC or the CSIR, or a similar test accredited by the UGC, like SET or who are or have been awarded a Ph.D. Degree in accordance with the University Grants Commission (Minimum Standards and Procedure for award of M.Phil./Ph.D. Degree) Regulations, 2009 or 2016 and their amendments from time to time as the case may be exempted from NET/SET:

   Provided the candidates registered for the Ph.D. program prior to July 11,2009, shall be governed by the provisions of the then existing Ordinances /Bye-laws/Regulations of the Institution awarding the degree and such Ph.D. candidates shall be exempted from the requirement of NET/SET for recruitment and appointment of Assistant Professor or equivalent positions in Universities/Colleges/Institutions subject to the fulfillment of the following conditions:

   a) The Ph.D. degree of the candidate has been awarded in regular mode only;

   b) The Ph.D. thesis has been evaluated by at least two examiners;

   c) An open Ph.D. viva voce of the candidate has been conducted;

   d) The candidate has published two research papers from his/her Ph.D. work, out of which atleast one is in a refereed journal; and

   e) The candidate has presented atleast two papers, based on his/her Ph.D. work in conferences/seminars, sponsored/ funded/supported by the UGC/ICSSR/CSIR or any similar agency.

Note :

1) The fulfilment of these conditions is to be certified the Registrar or the Dean (Academic Affairs) of the University concerned).

2) NET/SET shall also not be required for such Masters Programs in disciplines for which NET/SET is not conducted. However, Ph.D. degree shall remain the minimum eligibility for appointment of Assistant Professor in such disciplines.

B.

The Ph.D. degree has been obtained from a foreign university/institution with a ranking among top 500 in the world University Ranking (at any time) by any one of the following :-

(i) Quacquarelli Symonds (QS);

(cont'd. to page 94)

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(ii) The Times Higher Education (THE) or

(iii) The Academic Ranking of World Universities (ARWU) of the Shanghai.

Note: The Academic score as specified in Appendix II (Table 3A) for Universities, and Appendix II (Table 3B) for Colleges, shall be considered for short-listing of the candidates for interview only, and the selections shall be based only on the performance in the interview.

Salary & Allowances: Pay Scale as per UGC, State Govt. & S.R.T.M. University, Nanded rules from time to time.

Note :

1. Prescribed application form is available on the University **website: (www.srtmun.ac.in).**
2. No. T.A./D.A. will be paid to attend the interview.
3. Eligible candidates those who are already in service should submit their applications through proper channel.
4. All attested Xerox copies of certificates & other relevant documents should be attached with the application form.
5. According to Govt. rules, 30% and 3% seats will be reserved for women and differently abled persons respectively.
6. Relaxation of 5% marks at P.G. level for SC/ST candidates only.
7. The vacancies of Assistant Professors will be filled in subject to condition of the decision in Writ Petition No.12051/2015 pending in Hon'ble High Court of Judicature of Bombay, Bench at Aurangabad.

Correspondence Address :
The Principal,
Degloor College, Deloor
Tq. Degloor, Dist. Nanded - 431717

Principal	Secretary	President
Degloor College, Degloor	Adat Vyapari Education Society,	Adat Vyapari Education Society,
Degloor	Degloor	Degloor

Chh. Shahu Institute of Business Education & Research Trust, Kolhapur
College of Non-Conventional Vocational Courses for Women, Kolhapur
Shivaji University Road, Kolhapur, Tal. Karveer, Dist. Kolhapur - 416 004 (Maharashtra)
(Affiliated to Shivaji University, Kolhapur)
(Non Grant)

WANTED

Applications are invited from eligible candidates for the following posts:-

Sr. No.	Name of Posts	Vacant Posts	Open Posts	Reserved Posts
A	**Assistant Professor**			
1.	Communication Skill	01	01	--
2.	Computer	01	01	--
3.	Post Graduate Diploma in Nutrition & Dietetics	01	01	--
4.	B.Sc. (Food Technology & Management)	05	02	1-SC,1-VJA,01-OBC
5.	B.A. (Dress Making & Fashion Coordination)	05	02	1-SC,1-VJA,01-OBC
6.	B.A. (Multimedia)	06	02	1-SC,1-VJA,01-OBC, 01-EWS
7.	Bachelor of Interior Design	07	03	1-SC,1-VJA,01-OBC, 01-EWS
8.	B.Sc. (Environment Science)	05	02	1-SC,1-VJA,01-OBC
9.	B.Com. (Bank Management)	03	01	1-SC,1-VJA
10.	M.Sc. (Food Science & Nutrition)	04	02	1-SC,1-VJA
B	**Librarian**	01	01	--
C	**Physical Education Director**	01	01	--

1. Application with complete resume, should reach the College **within 15 days** from the advertisement.
2. For further details visit **www.unishivaji.ac.in** and **www.cncvcw.edu.in.**

Secretary & Managing Trustee
Chh. Shahu Institute of Business
Education & Research Trust
University Road, Kolhapur – 416 004

AGNEL INSTITUTE OF TECHNOLOGY AND DESIGN

AGNEL TECHNICAL EDUCATION COMPLEX, ASSAGAO, BARDEZ, GOA 403507
Tel / Fax: 9975797916 Email: aitdgoa@gmail.com website: www.aitdgoa.edu.in

AITD invites applications for the following position. Recruitment details are as given below:

Sr. No.	Department	Position	Nature of Appointment
01	Mechanical Engineering	Associate Professor - 01 Post	Regular basis

- 15 years Residence/ Domicile certificate in Goa issued by the competent authority.
- For the above post qualifications are strictly as per AICTE norms. For further details kindly visit: **www.aicte-india.org.**
- Salary:
  - For Regular Appointments: As per AICTE VIIth pay scale

The application form may be downloaded from our website www.aitdgoa.edu.in. Interested candidates are requested to send hard copies of their applications along with self-attested copies of all relevant certificates and a recent photograph to "THE PRINCIPAL" within 15 days from the release of this advertisement to the above mentioned address.

Fr. Agnelo Gomes
Director, ATEC

Matsyodari Shikshan Sanstha, Jalna

Motibag, Near Railway Over Bridge, Jalna-431203

WANTED

*Applications are invited for the posts of **Assistant Professor** in the colleges run by the sanstha on Granted Basis. Eligible candidates should submit their applications along with all necessary documents **within 15 days** from the date of publication of this advertisement.*

Sr. No.	Subject	No. of Posts	Qualifications	Reservation
1	Marathi	01	M.A. with B+, SET / NET / Ph.D.	S.C - 01 S.T - 02 NT (C) - 01 SBC - 01 OBC - 02 EWS - 01 Open - 05
2	Hindi	01		
3	English	01		
4	Geography	01		
5	History	01		
6	Political Science	01		
7	Commerce	01	M.Com.with B+, SET / NET / Ph.D	
8	Microbiology	02	M.Sc. with B+, SET / NET / Ph.D.	
9	Zoology	01		
10	Physics	01		
11	Mathematics	01		
12	Botany	01		

- Educational qualifications, pay scale, service conditions and recruitment for the above posts are as per the norms of UGC, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Govt. of Maharashtra and Matsyodari Shikshan Sanstha.
- The candidates belonging to reserved category should submit one copy of their application to the Dy. Registrar, Special Cell, Dr. B. A. M. University, Aurangabad.
- The complete application should be submitted to The Secretary, Matsyodari Shikshan Sanstha, Motibag, Near Railway Overbridge, Jalna, Dist. Jalna (MS) PIN – 431 203.
- Candidates who are already in service should apply through proper channel.

Secretary **President**

The Atpadi Education Society, Atpadi

Shrimant Babasaheb Deshmukh Mahavidyalaya, Atpadi
Tal. Atpadi, Dist. Sangli 415 301 (M.S)
(Affiliated to Shivaji University, Kolhapur)
(Permanently Granted)

WANTED

Applications are invited from eligible candidates for the following post :-

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Place : Atpadi
Date : 27/01/2023

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Special Numbers of the University News being brought out on the occasion of AIU Zonal Vice Chancellors' Meets during November, 2022—March, 2023 are on the following themes:

1. ***Evaluation Reforms for Transformative Higher Education*** to be published on February 20, 2023 on the occasion of West Zone Vice Chancellors' Meet to be held at Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra. Last date for receipt of Article is **February 10, 2023.**

2. Special Issue on the theme '**Transformative Higher Education for *Atma Nirbhar Bharat'*** will be brought out in the month of March, 2023. Last date for receipt of Article is **February 20, 2023**.

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(cont'd. to page 101)

(cont'd. from page 100)

Book

Miles, M., and Huberman, M.,(1994). *Qualitative Data Analysis*. London : Sage.

Articles

Over, R.(1982). Does research productivity decline with age?
Higher Education, 11, 511-20.

Chapter in a Book

Rendel, M. (1986). How many women academics 1912-1977? In R. Deem (ed.), *Schooling for Women's Work*. London: Routledge.

Article Retrieved from Website

Mazumdar, T (Year, Month, Date Published). *Article Title.* Retrieved from URL.

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