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Special Issue

on

TRANSFORMATIVE HIGHER EDUCATION FOR *ATMANIRBHAR BHARAT*

on the occasion of

97TH ANNUAL GENERAL MEET

&

NATIONAL CONFERENCE OF VICE CHANCELLORS

&

97TH FOUNDATION DAY OF AIU
(MARCH 23, 2023)

hosted by

UNIVERSITY OF SCIENCE AND TECHNOLOGY, MEGHALAYA
(MARCH 23-25, 2023)

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Table of Contents

Conceptualising the Association of Indian Universities 97th Annual General Meet and National Conference of Vice Chancellors on Transformative Higher Education for *Atmanirbhar Bharat*
– *Pankaj Mittal and Sistla Rama Devi Pani* 7

University of Science and Technology, Meghalaya: A Profile 16

Atmanirbhar Bharat Abhiyan and the Higher Education in India
– *Santishree Dhulipudi Pandit* 24

Transformative Higher Education for *Atmanirbhar Bharat: Reimagining* the Universities of Future
– *S S Mantha* 26

Transformative Learning: Unique in Equipping Learners with the Motivation and Skill to Build a Just, Equitable, and Sustainable Future
– *Jeff King and Eric Kyle* 28

An Approach to Reimagining a National Curriculum Framework for University Education
– *Tara Mohanan, K P Mohanan, Vigneshwar Ramakrishnan and Bhushan Patwardhan* 34

Strategic Input of Education for Sustainable Development in Higher Education Curriculum: Focus on Learning Outcomes
– *Kalyani Samantray* 42

Higher Education for *Atmanirbhar Bharat:* Training for the Future Jobs
– *Upinder Dhar and Santosh Dhar* 49

Transformative Higher Education: Critical to the Success of Self-reliant India
– *B K Patel* 51

Future of Learning and Adaptative Approaches for Higher Education Institutions
– *Atul Khosla, Rahul Chandel and Shyam Singh Chandel* 60

Structuring Philosophy of Education in Indian Context for Foundation of *Atmanirbhar Bharat*
– *Dibyendu Bhattacharyya* 64

Building a Resilient Higher Education System for Accelerated, Inclusive, and Sustainable Growth: The Role of Research and Excellence
– *Najma Akhtar* 67

Creating Research and Innovation Ecosystem in Indian Universities
– *S P Thyagarajan* 72

Higher Education and Research for the New Age
– *P B Sharma* 81

Creating a Robust Research Ecosystem on Campus: Strategies for Universities
– *Atul Khosla, Abhishek Sharma and Saurabh Kulshreshtha* 86

Significance of National and International Collaborations for Boosting Research
– *Dhrubajyoti Chattopadhyay* 91

Internationalization of Higher Education to Regain Past Glory of India
– *Prabha Shankar Shukla* 93

Creating a Gateway to Global Opportunities: The Importance of an Office of Global Affairs in Comprehensive Universities
– *Karunakar A K and M D Venkatesh* 97

Technology's Role in the Future of Enhanced, Highly Immersive, Engaged, and Personalised Education
– *Vistasp M Karbhari* 104

Emerging Technologies and the Future of Education: Opportunities and Challenges
– *G Sundar and P B Venkataraman* 109

How Technology is Reforming and Transforming the Higher Education System
– *Annpurna Nautiyal* 114

Six Digital Initiatives for Promoting Inclusive and Quality Higher Education
– *Pradeep Kumar Misra* 116

Integrating Skills with Higher Education
– *K Hemachandra Reddy* 123

Integrating Skills in Higher Education: Pathways for Institutional Commitment to Policies
– *Neeta Inamdar, Praveen Shetty and M D Venkatesh* 128

The Role of Higher Education Teachers: National Education Policy—2020 Context
– *Marmar Mukhopadhyay* 133

Last Thing First: Rubrics as Innovative Tools for Learning
– *B L Gupta* 139

Transforming Higher Education through Financial Restructuring: Minimum Funding vs Maximum Autonomy
– *S P Singh* 146

Education Budget: Empowering *'Amrit Peedhi'* in *'Amrit Kaal'*
– *Nikhil Kant, R K Soni and Kumari Anjali* 151

The Evolving Role of a Teacher: A Sage to Facilitator
– *Shalini Johar and Vinod Kr. Shanwal* 156

Teachers' Perspectives towards Integrating Pedagogy with Moral Principles as a Revival of Values in the Indian Knowledge System: A Study
– *Suprita Kumari Sinha and V K Shanwal* 160

Convocation Address
– Maharana Pratap University of Agriculture and Technology, Udaipur 165

Campus News 169

AIU News 171

Theses of the Month (Social Sciences) 174

Advertisement 178

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Conceptualising the Association of Indian Universities 97th Annual General Meet and National Conference of Vice Chancellors on Transformative Higher Education for *Atmanirbhar Bharat*

Pankaj Mittal* and Sistla Rama Devi Pani**

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. The Policy also strongly recommended a thorough transformation of the higher education system to meet the present and future needs of the nation and the planet. COVID-19 Pandemic compelled us to undergo massive disruptions and shifts in education processes and practices. The need of the hour is to adopt *Transformative Higher Education*. 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.

In order to guide and support the Indian HEIs in imparting state-of-the-art Transformative Education to the students, AIU as a representative body of HEIs in India has set out to organize its 97th Annual Meet and National Conference of Vice Chancellors Conferences ---2022-23 on the theme*: Transformative Higher Education for Atmanirbhar Bharat.* As a runup to the National Seminar, five Zonal Conferences of Vice Chancellors were organised on the subthemes related to the main theme.

The Association of Indian Universities (AIU) therefore, is organising its 97th Annual General Meeting (AGM) and National Conference of Vice Chancellors on the theme *Transformative Higher Education for Atmanirbhar Bharat* from March 23-25, 2023. It is being hosted by the University of Science and Technology Meghalaya.

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About AIU Annual General Meetings

Annual General Meetings (AGM) are one of the mega events of the Association of Indian Universities (AIU) which provides a unique forum for its member Vice Chancellors and leaders of the higher education system, national and international to exchange ideas and evolve consensus on various policies and initiatives for the betterment of Indian higher education system.

The Annual Meet is an occasion for AIU to showcase its past year's achievements, present its Financial Statements and delineate the scheme of activities for the forthcoming years. It is also a platform to inform the Members about the Recommendations of Zonal Vice Chancellors Meets and other Meetings conducted throughout the year and to agree on a collective course of action, policies, and initiatives.

Apart from a grand *Inaugural Ceremony* and splendid *Valedictory Function*, events marking the occasion are *AIU Governing Council Meet, AIU General Body Members Meet, Business Session, Interface Session with Indian Higher Education Functionaries,* and an *Interface Session with International Dignitaries*.

The *Inaugural Session* is graced by important dignitaries of the Country and distinguished guests. Captivating Speeches, Addresses, and the Release of the Special Volume of the 'University News' A Journal of Higher Education brought out by AIU, mark the happenings of the Inaugural Session. As Shri Ram Nath Kovind, Former President of India acceded our invitation to be the Hon'ble Chief Guest of the function. Shri Phagu Chauhan, Hon'ble Governor of Meghalaya, and Shri Conrad K Sangma, Hon'ble Chief Minister of

Meghalaya, Government of Meghalaya are also invited as special Guests of Honour.

This year 23rd March happens to be the 97th Foundation Day of AIU. Dr. Bibek Debroy, Chairman, Economic Advisory Council to Hon'ble Prime Minister, Government of India agreed to deliver the Foundation Day Lecture.

The *Interface Session with Indian Higher Education Functionaries* is graced by the Heads of the apex bodies, Councils, and other agencies of Higher Education. In the Meet a stocktaking of the prevailing condition of overall Higher Education in the Country is done and vital issues are discussed to arrive at tangible solutions. The forum is used to project the voice of the Vice Chancellors before the Government and other important agencies. In the *Interface Session with International Dignitaries'* issues related to cross-border education are discussed and possible collaboration and Memoranda of Understanding (MoU) are worked out. This year interface sessions are being graced by several dignitaries from overseas and international agencies and apex bodies of higher education in India.

About the Association of Indian Universities

The Association of Indian Universities (AIU), is one of the premier apex higher education institutions of the Country established in 1925. It is a research-based policy advice institution to the Government of India in the field of Higher Education, Sports, and Culture. Since its inception, it has been playing a vital role in shaping Indian higher education. Most importantly, AIU is vested with the power of according equivalence to Degrees/Qualifications offered by the universities across the world with those offered in India. Being an apex institution, it constitutes an integral part of all major decision-making committees and commissions in the country. As a representative body of Indian universities, it facilitates cooperation and coordination among Indian universities and liaise between the universities and the Government (Central as well as the State Governments) and also National and International bodies of higher education in other countries in the matters of common interest.

AIU is a think tank body with the responsibility of undertaking academic activities such as: conducting Research Studies in higher education; act as bureau of information on higher education; liaise with international bodies and universities for internationalization of Indian higher education among many others. AIU conducts inter-university sports and cultural events at national and international level. As a National Sports Promotion Organization (NSPO) it promotes sports among Member-Universities and maintain the standards in sports

The Vision of AIU is to emerge as a dynamic service and advisory apex organization in India by undertaking such initiatives and programmes which could strengthen and popularize Indian higher education as leading-edge system in the world and promote greater national and international collaboration in Higher Education, Research and Extension, Sports, Youth and Cultural Activities.

Its Mission is to promote and represent the higher education system and Indian Universities through strong liaison with the government and National/ International organizations of higher education, sister associations world over and establish liaison between/ among universities through active support, cooperation and coordination among the member universities and all its stakeholders for quality education, research and other academics and extension activities.

Dr. Sarvepalli Radhakrishnan, Dr Zakir Hussain, Dr. Syama Prasad Mukherjee, Dr K L Shrimali A.L Mudaliar, Dr Akbar Hydary, Prof A C Woolner, Pandit Amarnath Jha, Sir Maurice Gwyer, Prof Shiv Mangal Singh 'Suman', Prof M S Gore, Prof M S Adiseshiah, Prof M S Valiathan are among some of the stalwarts who served AIU as its presidents.

Whereas all the Indian universities benefit from its contribution, at present it has a membership of about 931 universities including 17 overseas universities from other countries viz. Bhutan, UAE, Kazakhstan, Mauritius, Malaysia Nepal, as Associate Members.

About National Conference

One of the key activities of the AIU is to convene the Vice Chancellors' conferences 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' Meets 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.

About National Conference on *Transformative Higher Education for Atmanirbhar Bharat*

The National Conference on *Transformative Higher Education for Atmanirbhar Bharat* will be organized on the second and third days of the Annual General Meet. There will be five Technical Sessions in the National Conference to discuss five subthemes viz. *Internationalization: Modes of Engagement; Minimum Government: Maximum Governance- What Does It Mean for Universities*; *Promotion of Indian Languages; Reforms for Holistic Education*; Creating *an Ecosystem for Research & Excellence; Future of Education, Learning, and Workplace.* A Special Session on the Promotion of Indian Languages will be organized on the occasion.

On the basis of deliberations, a commitment statement will be framed for the Indian universities and HEIs to adopt ***Transformative Higher Education in India***. In addition to academic deliberations, capacity development initiatives will be taken by forming a group of Vice Chancellors who will work on various dimensions of Transformative Higher Education.

Session Details

First Technical Session: *Internationalization: Modes of Engagement*

India till now, has not been able to take optimum advantage of the opportunities that internationalization offers. Nevertheless, the NEP-2020 has targeted the *Internationalisation of Higher Education* as an important goal and several measures have been initiated to promote Internationalization of the Higher Education, some of which *inter alia* include facilitating research/teaching collaborations and faculty /student exchange with high-quality foreign HEI and signing of relevant mutually beneficial MOUs with foreign countries; dual/joint degrees and twining programmes; encouraging high-performing Indian universities to set up campuses in other countries; selected universities e.g., those from among the top 500 universities in the world to be permitted to operate in India; setting up of International Student Office at each HEI for welcoming and supporting students arriving from abroad; counting credits acquired in foreign universities, wherever appropriate as per requirement for each HEI; and promoting courses and programmes in subjects, such as Indology, Indian Languages, AYUSH systems of medicines, yoga, arts, etc. Post NEP-2020, some of the steps taken to promote internationalization are:

i. Guidelines released for setting up of Office for International Affairs and Alumni Connect Cell in the campus of Universities hosting foreign students.

ii. 179 Universities have established Office for International Affairs and 158 Universities have set up Alumni Connect Cells.

iii. Draft Regulations for settings and operation of campuses of foreign universities in India released.

iv. In order to foster academic collaboration between Indian HEIs and foreign HEIs, "University Grants Commission (Academic Collaboration between Indian and Foreign Higher Educational Institutions to offer Twinning, Joint Degree and Dual Degree Programmes) Regulations, 2022" have been notified on 2nd May, 2022.

v. World-class foreign universities and institutions will be allowed in the GIFT City, Gujarat to offer courses in Financial Management, FinTech, Science, Technology, Engineering and Mathematics free from domestic regulations, except those by the International Financial Services Centres Authority (IFSCA) to facilitate the availability of high-end human resources for financial services and technology.

vi. UGC Institutions of Eminence Deemed to be Universities Regulations have been amended to allow Institutions of Eminence to set up Off-Shore campuses. The amendment to existing UGC institutions of Eminence Regulations delineates terms, conditions and approval process for the establishment of Off-Shore campus by Institutions of Eminence (IoEs) deemed to be universities.

vii. Increase of supernumerary seats for foreign students to 25% over and above the total sanctioned strength for admission to various UG and PG courses.

viii. For permitting credits acquired in foreign countries to be counted for the award of a degree, UGC has framed the draft UGC (*Academic collaboration between Indian and foreign Higher Education Institutions to offer Joint Degree, Dual Degree and Twinning Programme) Regulations, 2022*. These Regulations shall apply to Indian Higher Education Institutions intending to collaborate with Foreign Higher Education Institutions leading to the award of diploma(s) and degree(s) including Postgraduate and Doctoral programmes, and Foreign Higher Education Institutions intending to collaborate with Indian Higher Education Institutions. Academic Collaboration between Indian and foreign higher education institutions under these Regulations shall facilitate Credit Recognition and Transfer, Twinning Arrangements, Joint Degree Programme and Dual Degree Programme. The promotion of foreign academic collaboration shall be strengthened through the introduction of the provisions of a joint degree, dual degree, and twinning arrangement. This initiative will provide global exposure to the students; promote multidisciplinary and interdisciplinary education with an internationally relevant curriculum; improve employability; attract foreign students to study in India; and improve the standing of the Indian universities in international rankings as internationalization is an important parameter.

Important apex organisations which play as facilitators for Internationalisation are UGC, AIU, ICCR, AICTE, etc., University Grants Commission (UGC) is the regulator for promoting Government's vision and ideas. Indian Council for Cultural Relations administers various scholarship programs annually and awards about 3000+ scholarships under 26 different schemes to foreign students from about 140 countries. The Association of Indian Universities is continuously proactive in the process of Internationalisation. AIU with its strong network of universities and HEIs nationally and internationally is also contributing to getting Indian degrees recognised abroad through our counterparts in that country. AIU has already moved to futuristic credit-based evaluation and has updated its equivalence policy in line with the NEP--2020. AIU has also launched an *Indian Network for Internationalization of Higher Education (INIHE)* as an independent, autonomous, Pan-India consortium dedicated to the advancement of internationalization of higher education at all universities/institutions in India. AIU has also launched an *AIU Collaboration Portal* wherein all the member universities of AIU can showcase their best departments/centres/facilities where they wish to collaborate nationally or internationally.

Internationalization of higher education is not just a concept but also a transformational process that requires strong will and concerted efforts from Indian higher education institutions. In this Meet, there will be deliberations on Modes of Engagement for the Internationalization of Higher Education with special emphasis on:

(a) Experience in hosting International Students on Campus
(b) Modes of Sustainable partnership
(c) Roadmap to establish the Office of Global Affairs

Special Session on Promotion of Indian Languages

The National Education Policy--2020 recommended for the medium of instruction to be in the home language/ mother tongue/ local language up to at least class 5 and preferably up to class 8, wherever possible. The policy also provides for making available high-quality textbooks in their home language/ mother tongue and encouraging teachers to use a bilingual approach while teaching. In addition to this, it provides for more Higher Educational Institutions (HEI) and more programmes in Higher Education to use the mother tongue/local language as a medium of instruction and/or offer programmes bilingually. In a push for the government's efforts to promote indigenous languages and Indian Knowledge Systems (IKS) has set aside ₹300.7 crores for the national institutions for the promotion of Indian languages. It is an increase of 20% from 2022-23, and 70% from 2021-22 for the promotion of Indian languages, and has doubled the fund for the IKS scheme.

In order to assess the readiness of Indian universities to carry forward the Government's agenda of the promotion of Indian Languages, a Special Session is being held in the Meet. Prof. Chamu Krishna Shastry, Chairman, Bharatiya Bhasha Samiti, High Powered Committee for Promotion of Indian Languages, Ministry of Education, Government of India.

Second Technical Session: ***Minimum Government: Maximum Governance- What Does It Mean for Universities***

'Minimum Government, Maximum Governance' is a present-day slogan of the Government of India that refers to reducing government intervention in the common man's day-to-day activities and empowering the people to ensure their own as well as the country's growth and development. This is applicable to HEIs as well. While there are several aspects to achieving "minimum government", it broadly includes making government processes easier by reducing red-tapism and corruption and encouraging e-governance. Most importantly, it depends on orchestration between two attributes viz delivery mechanism and the rules and procedures which constitute the institutional framework to ensure effective and quality governance.

Governance in the higher education system is a complex interplay of the internal and external environment and macro and micro perspectives in the larger context in which it thrives. It is an important determinant of the success of any institution. Governance determines the way a university functions or is dysfunctional and defines its relationship with the government. Effective governance requires efficient institutions or vice versa. For Indian universities, the system of governance has been one of the continuous crucial challenges since their inception system, and all the committees and commissions set up so far recommended improvement in governance. To improve governance, several reforms were initiated but we are yet to see a visible impact on the efficiency of university governance in the country. Rather, the system has gathered criticism of being 'over-regulated and under-governed.

In order to resolve the issues pertaining to governance, autonomy, and quality, the NEP–2020 came out with several recommendations. Most importantly, the NEP-2020 recommends a gradual but effective shift from an input-centric approach to an outcome-based approach aligned with the 'light but tight' approach. This 'light but tight' governance mechanism will be based on ensuring integrity, transparency, and resource efficiency of the educational system through audit and public disclosure while encouraging innovation and out-of-the-box ideas through autonomy, good governance, and empowerment. To overcome challenges in streamlining governance in higher education and HEIs, the NEP-2020 recommends setting up the Higher Education Commission of India (HECI). All HEIs, public and private, shall be governed by an independent Board of Governors (BoG), which shall be the apex body for the institution, with complete autonomy. HEIs will be governed based on their IDPs. Each HEI will integrate its academic plans – ranging from curricular improvement to quality of classroom transaction – into its larger IDPs. The IDPs will become an important benchmark to seek grants and accreditation from respective bodies. This in fact is moving towards minimum government and maximum governance.

Quality and excellence are the outcomes of efficient governance. Assessment, Accreditation, Ranking, and Rating are new trends to indicate variations in the quality of HEIs. Different stakeholders have different expectations and opinions about ranking and rating. A university that appears in rankings can also be rated, and vice versa, although some universities may appear only in one or the other. Students are many a time confused about whether they should follow ranking or rating.

By very nature, universities are autonomous institutions that develop and operate in societies that are organized differently, because of their different responsibilities and functions. Autonomy means that the university is free to decide its own course of action, be it admissions, curriculum, hiring of faculty, starting new programmes or closing old programmes, and so on. For universities to be able to discharge their duties well, they must be ethically and intellectually independent of political and administrative intervention. There should be no interference from the government in any such decision. There can be incentives, but they should not be so strong that universities do not find any other option but to follow a particular path. Of course, autonomy can only be in conjunction with accountability.

In this session, there will be a discussion on the Governance of Higher Education and how the crucial issues regarding governance can be resolved through the formula of Minimum Government and Maximum Governance. There will be a discussion on finding strategies for creating effective governance mechanisms with emphasis on the following three subthemes:

i. Ideal Model for HECI
ii. Ranking & Rating Differential Harmony
iii. Autonomy: Issues and Concerns

Third Technical Session: ***Reforms for Holistic Education***

Education is the process of developing the mind, body, and spirit. Holistic education aims to develop all capacities of human beings that include intellectual, aesthetic, social, physical, emotional, and moral in an integrated manner. Such education helps in developing the all-around personality of individuals. They can possess critical thinking skills and higher-order thinking skills. Holistic education enables better learning outcomes in students and will be motivated to learn in-depth. It will equip the students with the skills required in the 21st century.

For any educational task to be completed three components are essential viz. Input--- Process--Output. Outcome Based Education (OBE) is an educational theory that envisions or emphasizes an educational system that is focused on output i.e. goals or outcomes. It is an educational model in which curriculum and pedagogy and assessment are all focused on student learning outcomes. It is a method of curriculum design and teaching that prefixes how students can apply their knowledge and skills after they pursue a course. i.e. the Learning Outcomes are pre-decided and the teaching and learning methodology; course delivery and assessment are planned to achieve stated outcomes. The outcomes should be specific (well-defined), achievable (realistic), and measurable (analysis, synthesis). The thrust is on what a student can do after completing a course or programme. Being student-centric, it empowers students to choose why and how they would like to study. If the outcomes are not achieved, they are re-taught the concepts to ensure that there is continuous quality improvement within the education system. Thus, for outcome-based learning, a certain framework model must be developed and followed; the first step is to identify desired outcomes, design an outcome-based curriculum, adopt and use appropriate teaching-learning pedagogical tools, and design suitable assessments to measure the attainment of the learning outcomes. NEP-2020 also emphasized Learning-Outcomes-Based Higher Education.

With enormous industrial market demand for graduates possessing employability skills and enhanced economic growth of a nation, skills are considered an essential part of holistic education. This has created a requirement to integrate skill-based education in higher education intending to develop graduates' future work-ready. Thereby, a considerable necessity has been felt to align higher education with skill-based education and to incorporate skill-based education as an essential part of the higher education system.

Evaluation is an inevitable component of the education system and thus, it is one of the essential aspects of Holistic Education. Evaluation in the context of education is a process of determining the extent to which predetermined educational objectives have been achieved. It involves a large number of functions with respect to the learners, the teachers, the curriculum, and the system of education as a whole. It is a broad term that enfolds in its ambit a number of systems on which it is applicable. There is growing recognition around the world that it is not just enough to conduct examinations through prevalent methods. There should be a strong readiness for innovation and technological interaction including the use of Artificial Intelligence. NEP-2020 also envisions nurturing innovation in all domains of education and recommends the need to innovate in all components of education. The vision of the policy is to improve the quality of education by giving equal space to creativity and innovation and transforming India into a vibrant knowledge society. Therefore, creating a conducive and enabling environment for innovation and not merely sticking to the traditional methods of teaching and testing is the need of the hour.

The discussions will primarily focus on the framework, design, and components of holistic education; address key issues in designing the curriculum for holistic education; share relevant innovative and best practices, case studies, and lessons in holistic education; ways to enable educational leaders, educators, policymakers, and other stakeholders to unlock and utilize the potential of Holistic Higher Education and work out strategies to initiate reforms for Holistic Education with special emphasis on subthemes:

i. Promoting Outcome Based Learning

ii. Integrating skills with higher education

iii. Innovative Assessment & Evaluation Techniques

Fourth Technical Session: ***Creating an Ecosystem for Research & Excellence***

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 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.

The National Education Policy (NEP) 2020 report also laid a lot of 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. To realise Transformative Higher Education in India, it is essential to bring teaching and research in Indian universities to the grips of quality and excellence.

In order to fructify the efforts of the government and HEIs in the area of research, each institution must find its own ways to create a research ecosystem through a pyramidical structure of research groups with undergraduates at the base and postgraduates, doctoral and junior faculty in the middle, and NRF and other nationally and internationally reputed research at the top. There is no better way than to create universities' own institutionalized processes to create the ecosystem.

The research ecosystem includes, among other things values, goals, customs or traditions, expectations, the ethos of openness, institutional processes, and so on, internalized over a long period of time. Faculty with research eminence is absolutely a must to generate and sustain a research ecosystem. Once the right environment for research is created, faculty and students can be cultivated to participate in research.

The discussions in the Session will primarily focus on the status of Research in Indian universities; address key issues involved in creating an ecosystem for Research & Excellence; 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 creating an ecosystem for Research & Excellence with special emphasis on:

i. National & International Collaboration for Boosting Research.
ii. Ways to create a research ecosystem on campus.
iii. Innovative Methods & Skills for Impactful and socially relevant Research

Fifth Technical Session: ***Future of Education, Learning, and Workplace***

India has witnessed phenomenal growth and innovative developments in communication technologies in the past 75 years. It is evident with the fact that proliferation of electronic media and the internet has led to the massive consumption of media content, resulting in modifications of diverse branches of education. These dynamics in technology have connected several societal constructions with one another and media, including, health sciences, management, law & Judiciary, politics, social sciences, social work, economy, and environment, etc.

Technology has also had a profound impact on how teaching and learning work due to which teachers acquired the role of facilitators. Technology also facilitated learning to happen in different places, activities, methods, and time frames. There are so many formats in which learning can take place ranging from classrooms stuffed with more than a hundred students; to one-on-one mentorship programmes, interactive online games, and complex technical textbooks. Similarly, there are a variety of students with different learning conveniences. Technology has always played an important role in education, but its current use is more prevalent than ever due to the increased availability of smart devices and web-based curricula. With the rise of Artificial Intelligence in education, there are many ways in which students get support. Personalised learning is one among them which involves customization and adaptation of educational methods and techniques so that the learning process is better suited for each individual learner with their own unique learning style, background, needs, and previous experiences. In a personalized learning approach, the learner's personal experience, knowledge, and habits are connected with learning methods, so that they can learn faster, understand new concepts more easily, and improve their learning performance. If we want to increase the GER and improve the learning outcomes, personalized learning is essential.

AI educational solutions can fill needs gaps in learning and teaching and allow HEIs to do more than ever before. AI can drive efficiency, personalisation and streamline academics and administration tasks to allow the time and freedom to provide understanding and adaptability. By leveraging the best attributes of machines and teachers, the vision for AI in education is one where they work together for the best outcome for students. Since the students of today will need to work in a future where AI is the reality, it's important that our educational institutions expose students to use the of technology. A few technologies with AI that are already affecting education in every way are Chatbots, Virtual Reality (VR), Learning Management Systems (LMS), Robotics, etc. These tools can be used for a variety of purposes, most importantly to assign coursework, communicate with students and parents, track student progress, generate reports on student performance, etc.

Although we cannot predict with certainty the types of jobs that will exist in the future, we know that today's students will need a variety of skills required for thriving in the 21st century called, '21st-century skills'. Knowing this, we need to explore the best ways to provide all students with authentic, unique, and innovative learning experiences that will foster the development of these essential skills. Students need to be prepared for jobs that may exist at some point ever-changing world. Looking at the changes in the areas of education and the world of work, the best action

which can be taken is to offer specific types of learning experiences for all students. If we create readiness in them to learn and explore the world, then they will have skills, real-world awareness, and flexibility that will equip them to survive in this constantly changing system.

The role of teachers has now changed considerably and they are expected to work as facilitators in view of the large number of open resources available. Technology has impacted the teaching pedagogy and teachers are expected to be the champion of such change management.

Thus, in this session, there will be deliberations on methodologies and technologies required to impart personalised learning in Indian HEIs; changing role of teachers, measures, and strategies to optimize the use of AI in higher education for envisioning. Future of Education, Learning, and Workplace with special emphasis on:

i. Technology-based personalized teaching-learning models

ii. Changing role of teachers as facilitators

iii. Preparing the students for future jobs

Format and Approach of Technical Sessions

The Sessions will be of 1 Hour and 30 Minutes each. In each Session, there will be experts and academicians as speakers and chairs. Presentations will be followed by interaction and Q and A. On the basis of deliberations, a commitment statement will be framed for the universities to further the cause of achieving Higher Education in India. In addition to academic deliberation, capacity development initiatives will be taken by forming a group of Vice Chancellors who will work on various dimensions of adopting Transformative Higher Education in HEIs.

Participation and Organization

Vice Chancellors of Indian Universities, Experts from Ministries in the Government of India, Heads and Officers from Apex Bodies of Higher Education and School Education, dignitaries from international organisations and embassies, and High Commissions in India International delegates from different countries and Academia will be participants, speakers, and Session Chairs. Discussions will be conducted in English. Sessions will be in blended mode. The speakers, chairs, and participants need to inform in advance about the mode through which they would attend the Meet.

Conclusion

Given the increased expectations on the Higher Education System due to various economic, social, and environmental reasons, there is an urgent need to bring disruptive changes in the higher education system of the country. Immediate action, therefore, is required in all Indian higher education institutions to adopt such methodologies, technologies, and pedagogies, which can lead to required transformations to make education relevant and useful. In this scenario, it is inevitable for higher education institutions to take the lead and work toward transformation.

The recommendations of this Conference will constitute the discussions on the recommendations that emerged out of deliberations in the Zonal Meets on this theme. On the basis of the recommendations of this National Seminar, '*University Action Plan on Adopting Transformative Higher Education'* will be prepared which will be a handy guide for Higher Education Institutions of the Country. A Policy Document will also be prepared and presented to the Government of India.

The Association of Indian Universities (AIU) anticipates a fruitful and meaningful interaction toward the resolution and realization of a common agenda for academic excellence through transformative higher education. This Vice Chancellor's Meet is but a stepping stone in the direction of building new higher education system to build new India.

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University of Science and Technology, Meghalaya: A Profile

The University of Science and Technology, Meghalaya is hosting the 97th Annual General Meet and National Conference of Vice Chancellors-2023 of the Association of Indian Universities, New Delhi from March 23-25, 2023.

University of Science and Technology Meghalaya (USTM) is a dream-come-true project of ERD foundation run under the Chairmanship of Mahbubul Hoque who started his eduprnuerial journey with just one computer and four students in 2001. Today the foundation has the largest institutional network in the northeast region catering education from KG to PG to Ph.D. through its two CBSE affiliated Senior Secondary Schools, one Engineering College, one Law School, one B.Ed College, two Pharmacy Colleges, one Business School, one Physiotherapy College, one Women's College, and one University. At present, USTM through its 25 departments is imparting education to 6500 students of which, nearly 20% of students are availing free education. Nearly 90% of USTM's total enrolment is that of rural students, with over 43% tribal students and 57% girl students.

Recognitions

The University was established under Act No.6 of 2008 enacted by the Legislative Assembly of Meghalaya and notified vide Gazette Notification No. LL (B) 87/2008/21, dated 02.12.2008. USTM approvals of UGC, AICTE & NCTE. University that has been awarded the accreditation rating of "A Grade" in its first cycle of assessment by the National Assessment and Accreditation Council in 2021 and ranked among the top 200 universities of India in the NIRF-2022 ranking.

Research & Development

The University of Science and Technology, Meghalaya (USTM) provides vibrant interdisciplinary research that will attract the best people from the country. This will creatively contribute to solving the economic, technological, and social issues of the global human society. The University promotes active and vigorous leadership to the researchers in shaping their intellect for the achievement of common goals of humanity. For meeting the needs of the future, the University enhanced research through collaborations with leading research institutes and consortia around the country, where cutting-edge research is taking place.

The University has constituted Research and Development division, which monitors and provides continuous guidance to the research staff to raise the standard in academic and research activities. The University organize a series of seminars, workshops, and conferences to encourage research scholars; and holds regular brainstorming sessions to generate ideas. USTM is taking regular initiatives for collaborations and tie-ups with different Industries, R & D organizations, universities, IITs & Placement Agencies for the overall benefit of students and is presently collaborating with 222 different institutions for industry-academia linkages. It is strengthening the Research Portal to provide support to the researchers so that the commercial exploitation of the research output is made feasible. The university also offers organizations and various bodies the possibility to request tailor-made integrated solutions to their needs, based on research activities. The studies conducted in various fields are:

- Studies on *Munga* Culture, Tissue Culture, Performance of Eri Silk Worm, *Muga* Silk Worm, Eri Culture, Sericulture, Biodiversity of North East, Rice varieties in North East, Molecular Characterization of Protein, Ethno Botanical Studies in NE, High oil yielding Jatropha, Bio and Chemical management of *Aphis Gossipii Glover*, Milk Production, Cell Biology, Microbiology Ornamental Fish Diversity in Northeast India and their sustainability, Spatial and Temporal changes in Land – Use/Land cover of Wildlife Sanctuary of Meghalaya.
- Sustainable Livelihood and Pineapple Cultivation, Socio-Economic Growth of Small-Scale Industries, Hospital Management, Employee Retention in the service sector, EPM in Public and Private Organization, Empowering women through livelihood promotion, Finance, and

Stock exchanges, Study on Brahmaputra Basin, Heritage Tourism, River Tourism, etc.

- Studies on Low-Cost Housing, Real Estate sector in NE, Magneto Hydrodynamics, Fuzzy-logic, Microwave Transmission, Micro Antenna Design, Synthesis of Reusable Metal-free Photocatalysts for Visible Light Aided Generation of Benzyne Intermediate: A Key Route of C - C & C - hetero - atom Bond Formation, Study on Structure, Folding and Membrane Interaction of Radially Amphiphilic Antimicrobial Peptide using State-of-the-art Computer Simulation Techniques.

- Studies on the Educational Status of Backward Class Women, Methods of Teaching, Social Impact of Riverbank Erosion, Traditional Handloom Culture, Social Status of North East Tribes, and Educational Scenario in the North East.

- Peace Studies in NE, Music therapy, Song and Music of Dr. Bhupen Hazarika, Traditional Culture of NE India, Folk Music.

- The University welcomes Research Scholars, Scientists, Academicians from reputed universities, R & D organisations, Industries, NGOs, Government, and Pvt. Organisations for joint and collaborative research, project, and seminar in different emerging areas.

Advanced Research Centre

Advanced Research Centre (ARC) is a multidisciplinary research centre located at the University of Science and Technology, Meghalaya. The centre is situated at a pristine location in the hills of Meghalaya and provides the perfect environment for carrying out high-quality research. Our aim is to develop a world-class research institute and provide training in a broad area ranging from material science to Genetics.ARC is committed to being a state-of-the-art research centre for achieving excellence in identified crucial areas of Science and Technology.

Research at the Centre is carried out in respective units which are divided based on primary research focus. These Units are Molecular Biology and Genetics, Chemistry, Material Science, and Microbiology. Collaborative research is being facilitated in ARC among the different units to yield more fruitful and productive research work. Being a research institution of higher learning, the primary goal of ARC is to produce well-trained Ph.D. and Master of Science students.

At the ARC, our core values drive our commitment and purpose. Our core values are the pillars that guide the ARC in building an organisation that reflects who we are and what we do. All members of ARC look up to and follow this principle to dive into their own potential and work towards achieving groundbreaking research.

Curriculum Enrichment

USTM has constantly and meticulously pursued the best practices of developing and updating course curricula taking support from the best academic and intellectual talent available in academia and industry. Institutional bodies prepare the curricula keeping in view their relevance to local, national, regional, and global developmental needs and objectives. The development and review of the syllabi are done in consideration of industry trends, feedback from stakeholders, norms of statutory bodies, and benchmarking with institutions of repute.

USTM integrates cross-cutting issues relevant to gender, environment and sustainability, human values, and professional ethics which are evident from a list of mandatory courses in the curriculum for both UG and PG Programmes. The university believes in, and promotes gender equity, sensitizes on issues of environment and sustainability, humanitarian ideals, and ethical issues as values for social inclusion through its curriculum. The curricula provide adequate scope for undertaking activities to uphold core values of social significance. Some of the areas of emphasis are presented here.

Human Rights and Gender

Different courses like Human Rights Education, Gender School and Society, Equity and Gender Issues in Rural Development, Introduction to Human Rights, Sociology of Gender, Human Values and Professional Ethics, etc., cover this aspect in value education and ensure that mutual respect is practiced irrespective of gender and creates an environment based on the stakeholder and their contribution rather than gender

attributes. Through these courses, students are apprised of gender sensitivity and various approaches to working towards gender equity.

Environment and Sustainability

The courses such as Environmental Studies, Environmental Education, Fundamental of Ecology, Climate Change and Environmental Management, etc., describe various concepts of the environment namely; pollution, biodiversity, and sustainable development giving the students a perspective of co-existence with nature and sensitizes them on the need for a healthy environment. The University has taken initiatives towards afforestation and several other green practices within the campus so that we exemplify what we teach inside the classrooms to inculcate a sense of ownership of this responsibility to co-exist with our environment and help them join the global call for integration of environmental protection and development. The courses also help young students to actively participate in disaster management.

Human Values and Professional Ethics

The courses such as Peace and Value Addition, Human Rights Education, Employees Relationship Management and Labour Laws, Human Values and Professional Ethics, etc., are imparted across the programmes in order to inculcate these values in students and develop a high standard of ethics in their professional careers. Students are engaged in social activities as a part of their curriculum as well as in social outreach programmes. The University emphasises following ethical practices in research as governed by the Ethical Policy. Students are regularly involved in activities such as volunteering in Relief Camps, Blood Donation Camps, Free Health Check-up, Hygiene and Health, old age homes, Guest Lectures, Community outreach, etc., in order to ensure that these issues and related values are demonstrated by the students and faculty and practiced day to day.

Moral and Ethical Values

Moral and Ethical Values are an integral part of the education of students. USTM celebrates, observes, and commemorates important days such as Independence day, Republic day, Gandhi Jayanti, Social Justice Day, International Day of Girl Child, World AIDS Day, World Forestry Day, World Autism Awareness Day, Teacher's day, International Yoga Day, *Matrubhasa Divas*, World Environment Day, World Earth Day, World Water Day, National Unity Day, International World Wildlife Day, Youth Day, etc., to nurture values in the students.

Central Library

The Central Library of the University of Science and Technology, Meghalaya (USTM), consecrated in the name of Maulana Azad Central Library came into being in the year 2011. The Library sets the goal of a world-class library by integrating information sources and services across disciplines under one umbrella by building a sound and comprehensive collection of both print and electronic resources on all branches of knowledge with robust hi-tech infrastructural facilities and redesigning and revamping the systems and services in efficient, effective, and dynamic ways tailoring to meet the myriad information needs of students, research scholars, and faculty members of the university pin-pointedly, exhaustively and expeditiously anytime during library hours for promoting academic excellence. The Library is named Maulana Azad Cental Library after the name of Abul Kalam Azad, the first education minister of independent India, the man who introduced the national education system with free primary education and modern institutions of higher education. Maulana Azad is also credited with the establishment of the Institute for national importance like the Indian Institute of Technology (IIT) and the foundation of the University Grant Commission (UGC), an important institution to supervise Universities. Maulana Azad Central Library supports the teaching, research, and extension programs of the university. All students, faculty members and research scholars, and employees of the university are entitled to make use of the library facilities by taking library membership. The Library has a collection of more than eighty thousand volumes of books on Applied Sciences, Biological Sciences, Business Sciences, Education, Engineering and Technology, Social Sciences, and Humanities, and offers library services through its various sections. The Library has now been catering to the needs of more than 5000 students, research scholars, faculty members, and administrative and nonteaching staff of the university. With the developments in Information

and Communication Technologies, the behavioral characteristics of library users have been changing rapidly and the library is trying its best to adapt to the technological advancement through the digitization of the library. The identity of all books and the library users are fully bar-coded and all Library housekeeping operations like acquisition, cataloguing, circulation, and periodical services have been automated with the help of Koha.

Centre for Skill Development (CSD)

Vocational Education (VE) is a significant component of the national education system. The National Education Policy on Education (2020) also recognizes the vital role of Vocational Education and plays its role effectively in the changing national context and for India to enjoy the fruits of the demographic dividend, the National Policy has reimagined the critical elements of vocational education to make it more accessible, flexible, contemporary, relevant, inclusive and creative.

Different Forums at USTM

Students' Forum

The Students' Forum of USTM is one of the most active bodies where a group of talented all-rounders is selected by the authorities of the management based on their academic and extracurricular performances to represent the university on various platforms. The students are coordinating with the management for the smooth functioning of various events related to the students and the university. The members are also monitoring the activities of the various forums like sports, culture, debate, quizzes, etc. The office of the Director of Students' Affairs is monitoring their performances, roles, and responsibilities and makes changes when and where required as per the norms of the university.

Sports Forum

USTM is a Pro Sport University that gives equal importance to sports along with academics, for the all-round development of the personality of the individual for shaping a better tomorrow and assisting in the process of Nation Building. Students interested in various games and sports are provided with ample amount of opportunities through the Sports Forum so as to cater to the needs of the students. Training programs for the preparation of teams for various games and sports is one of the major objectives of the Sports Forum. Believing in the concept of "Sports For All" the university organizes various inter-departmental tournaments all around the year and also provides an imposing platform for individuals and teams to showcase their talent in the events conducted by other colleges and institutions.

USTM NET FORUM

USTM has established the NET Forum with the objective to create an environment among students for excelling in research and higher studies. Through this NET Forum, coaching is given to the UGC NET and CSIR NET aspirants free of cost, in order to help the students for getting selected for the post of Assistant Professor and the award of Junior Research Fellowship. The PG students are availing Coaching in various subjects and also coaching for Paper I and Paper II in Morning and evening hours respectively. Apart from the in-house faculty members, guest faculties and experts from various universities frequently take classes for the NET aspirants. The University is providing all the facilities including transportation and refreshment for the students undergoing the classes.

Cultural Forum

University of Science and Technology, Meghalaya has been the benchmark for quality education as well as excellence in extracurricular activities. Apart from academics, the University has been the launch pad for those with exemplary talents and provides facilities to many youths in the cultural field. The Cultural Forum accommodates such young talent and students of such caliber to perform in their respective fields with passion and grace. The Forum mainly deals with event management and also provides an imposing platform for individuals to showcase their talent in the events conducted by other colleges and institutions. The students get the opportunity to know the eight states of Northeast India along with other states of the country. The Forum also provides training in music (Indian/Western), dance (Indian/Western), instrument playing, etc. The special classes are arranged every Saturday and Sunday for interested students where

renowned experts from various fields of music and culture are invited to train the students.

Debate Forum

Realizing the unprecedented parameter of credibility, the speech form has to offer, the University of Science and Technology Meghalaya opened up its deck to flourish and facilitate the same. USTM has launched a systematically designed platform to groom professional orators in terms of the norms and nuances of debating and public speaking to enhance leadership syndromes within the student fraternity. The USTM DEBATE FORUM is committed to nurturing budding talents, cutting across a plethora of students from diverse fields and academic orientations, and creating opinion-makers and deliberators. The Forum has been intensively operative in conducting mock debates, Debate workshops, interdepartmental Debating contests, public speaking exercises, modulation practices, formal training on the parliamentary form of debating, etc. Apart from these, the forum also intends to involve veteran debaters from all over the region to train, mentor and guide students in developing a knack for debating.

Quiz Forum

Quizzing can be expressed and explained as an embodiment of our choice to learn, curiosity to quest, and caliber to hit the bull's eye, both in the game of glory and the gamble of life. Realizing the parameter of this mind sport, USTM has formed the Quiz Forum. The Forum caters to the requirements of modern, interactive, innovative, and technology-driven quizzing modes with state-of-the-art facilities to woo and amaze knowledge seekers. A host of activities like inter-departmental, inter-hostel, and inter-institutional quizzing events are being designed to generate competitive enthusiasm among the student fraternity.

Innovation Ecosystem

Innovation &Start-up-being an important attribute of USTM, as a part of our Strategic Plan we wanted to come up with Innovation Centre, as an ecosystem promoting Innovation. The ecosystem started taking shape in 2014 when we gave a proposal for infrastructural support to the Ministry of Food processing, which was approved in October 2014. Our students started taking initiatives in this direction and came up with many innovative projects. This encouraged us to realize our vision of an Innovation Centre. In 2017 we initiated our coordination with EDII, Ahmedabad for a Technology Business Incubator (TBI) with multiple projects lined up by several of our departments. Developed an advanced food processing laboratory, equipped to do research on Food alternatives and solutions for our students of Food Science and Technology. Financial grant of Rs. 75,00,000.

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Developed an advanced food processing laboratory, equipped to do research on Food alternatives and solutions for our students of Food Science and Technology. A financial grant of Rs. 75,00,000 from the Ministry of Food Processing in 2014 was received.

Setup a Technology Business Incubator(TBI) with support of Rs. 25,00,000 from EDII, Ahmedabad for DST-NewGen IEDC(Innovation and Entrepreneurship Development Cell) 2017 under the aegis of National Science and Technology Entrepreneurship Development Board (NSTEDB), DST, Govt of India, New Delhi.

In 2019,University upgraded the TBI to Centre for Innovation, Incubation and Entrepreneurship with own funding and identified mentors supporting the students in selection of projects and guidance on project work.

Developed a sophisticated state of the art Central Instrumentation Centre in the campus. Fully equipped Central Workshop facility. Science laboratories with latest equipment and facilities.

We also conducted various activities for strengthening the ecosystem of innovation:

Entrepreneurship Awareness camps July, Aug, Sept 2018 of 3 days each Establishing MOUs with neighboring industries and conducting industrial visits Participation in Innovation Conclaves 2019 and received innovation awards uploaded Faculty are encouraged with financial support for seminar, workshop and training. PG students visiting other institutes for project offered financial support. A Central Diary farm implemented in campus to produce milk for students and generate manure for horticulture and pisciculture with recycled vegetable waste. Ducks released in the pond fed with organic manure which in turn helps fish breeding. Social outreach visits helped identify project areas. We set up an Organic Market for villagers in Campus.

Campus facilities

The Campus: The University is located in a 300-acre picturesque landscape surrounded by tranquil greenery in the Assam-Meghalaya border which provides an excellent ambience for teaching- learning. The campus has all the basic facilities required for an academic institution.

Amenity Center It is a MART having different kinds of eateries, books & stationeries shops, tailoring shops, hair salons & parlors where students can fulfill all their daily necessities and at the same time enjoy their food in the lush green background.

Green Campus: The entire campus is being developed keeping the natural greenery and the contour intact and at the same time the landscaping with green and ornamental plants is being done to make the campus green and pollution-free. All the street lights within the campus are powered by solar energy and thereby decreasing the dependency on traditional power sources. For intra campus movement battery operated carts ply between the academic blocks for easy mobility. An air monitoring device is being installed to keep a tab on the pollution level within the campus. Rain water harvesting facility has been developed as well.

Waste Management: The University has a comprehensive waste management plan for the whole campus, where an exclusive Waste Treatment Plant has been set up to take care of the solid waste; the sludge is being used for agricultural purposes and the Bio-gases left out at the end of the treatment is used for cooking purpose in the hostel. Effluent treatment plant is also set up to treat the liquid waste coming from the laboratories.

Health Facilities: The campus has a well-equipped day care health clinic with a full time Doctor and one Nurse. The clinic is attached with a medical shop to take care of the health requirements of the hostel students as well as the day scholars. In addition, Ambulance service is available to shift the patients to empanelled hospital for advance treatment.

Campus Security: Separate hostels for both boys and girls are available within the campus having in house canteen facility backed up by 24x7 water and electricity. The hostels are equipped with 24x7 Wi-Fi facilities for the students to access e- learning resources. Further the students can also access the Central Library till 10.00 PM. To keep a strict vigil of the campus security personnel are manned 24x7 along with CCTV monitoring.

Other Amenities:

- Guest House facility within the campus for both internal and external guests.
- Shuttle bus service
- ATM facility
- The campus has a state of the art 3500+ capacity Auditorium where dramatics, cultural activities, events etc. are organized from time to time for the benefits of the students.
- Department of Botany and Zoology has started an Herbal Garden & a Bio-Diversity Park respectively, which have also enhanced the overall university ambience.

University towards an Inclusive Environment

Since its inception, USTM is committed to upholding and promoting the values of inclusion and pluralism. As an institution, it has demonstrated tolerance by means of considerable and consistent efforts in fostering an inclusive, multicultural, and diverse environment for its stakeholder—faculty, staff, and students; tolerance and equality of opportunity to all irrespective of race, ethnicity, age,

gender, sexuality, socio-economic status, religion and disability.

Neighborhood Mission

Under this inclusion initiative, the indigenous people of the hilly backward villages near the campus are provided gainful employment (nonteaching staff) in the institution, regular free health check, plantation drives in the villages, social awareness drives, free education in the institution apart from developing a model village in the area.

Local Festivals

The Institution observes local festivals like Wangala (Garo community), Nongkrem (Khasi community), etc., and gets together meets to promote tolerance and harmony among the people.

Gender Initiatives

Special thrust is put on the development of women and 90 % of the girl students of rural areas studying here are getting benefits in admission and scholarships and free-ships. The institution reserves 50% of seats for girls while nearly 75% of employees in the institution are female.

Northeast Graduate Congress

The North East Graduate Congress, organized by USTM, is the only graduate congress in the country that is participated by more than 7,500 students every year from more than 200 different colleges in the North East. The Congress is aimed to enhance all-around development and bring out capabilities of the future graduates through various life skill processes and expose them to various opportunities. Renowned academicians, Vice Chancellors of Central and State Universities of North East, internationally acclaimed motivational speakers, entrepreneurs & stakeholders from industries participated as speakers including Prof. D P Agarwal, Former Chairman, UPSC, New Delhi; Arjuna awardee Monalisa Baruah Mehta; Hardik Patel, Youth Leader from Gujarat; Ms Ruchi Gupta, AICC Jt. Secy and In-Charge of NSUI; Jignesh Mevani, MLA from Gujarat; Prafulla Kumar Mahanta, former Chief Minister, Assam; Rohit Chahal, National Media In Charge, BJP (Youth Wing) and Allantry Dkhar, Vice President of UDP, Meghalaya, Shri Jagdish Mukhi, Governor of Assam. Through different competitions like Games, Debate, Photography, Creative Writing, Quizzes, and Best Graduate, NEGC has offered a unique platform to the participants for sharing views, knowledge, and ideas with each other and exploring their talents taking guidance from experts in different fields. Every year NEGC is organized by USTM as a regular event to groom the future generation of youth of this country.

Cultural Procession

The institution undertakes efforts to showcase the cultural heritage of the nation by organizing cultural processions every year including all communities of the North East.

Regional Language Lab, Art Gallery

In collaboration with the Asom Sahitya Sabha—the apex literary body of Assam, a Directorate of Language was established that works on research on regional languages. A master's programme in Khasi Language has also been introduced. The PA Sangma Chair Professor for Tribal Studies under the Department of Sociology is functioning in full swing. Apart from an Art Gallery, the theme song of the Institution incorporates different languages of the region as a testimony to its commitment to values of inclusion.

Talks & Workshops

Talks and workshops by eminent persons are organized from time to time with themes like tolerance and harmony towards cultural, regional, linguistic, communal, socioeconomic, and other diversities.

Free Education, Skill Training

The Institution gives scholarships and free ships to deserving students irrespective of race, religion, or ethnicity. It has shown respect to the stalwarts of various communities by offering scholarships/ fellowships in their names.

Academy for Physically Challenged

'I Can I Will Academy' was opened to provide free education and skill training to those who are differently abled in society.

All Religion Prayer Meet

All religion prayer meets are organized to pay tribute to great personalities or for any other purpose of common human interest, and peace and take inspiration from the lives of great men and women so as to inspire students and inculcate the values of inclusion that USTM is inherently committed to.

Best Practices

Payback Policy to Boost Competitiveness

The Payback Policy was launched in 2014 with the motto *"Crack Competitive Examination & Get Back Entire Fees*". Successful aspirants who achieve success in the designated competitive examinations have their entire course fee paid back to them in a glittering, gala felicitation programme as a recognition of their hard work and commitment to excellence which USTM stands for and fosters

In tune with the vision of USTM to unveil excellence, this policy seeks to create awareness besides incentivizing merit and effort towards excellence by the students, particularly those from the deprived sections in various competitive examinations so that their participation in the public and private sector increases exponentially besides becoming role models of excellence for their peers, community, and society. To provide quality, in-house orientation, guidance, training, and coaching to aspirants. To muster support for the conduct of coaching from eminent administrators, academicians, and professional experts for the preparation of competitive examinations like NET, GATE, SLET, UPSC, and Provincial Civil Services.

The number of aspirants appearing in competitive examinations is increasing day by day leading to cutthroat competition with razor-thin margins for success. It, therefore, demands, aspirants be equipped with the necessary skills, motivation, and orientation to come out with flying colours. The Centre for Career Guidance, USTM has been established to streamline the activities related to competitive examination (UPSC/NET/GATE/SLET/State PSC/Banking/SSC) and to provide coaching & guidance to the aspirants so that necessary skills are honed, weaknesses rectified and capacities built for success.

Career Guidance

The Centre for Career Guidance has introduced a turnkey course on BA Administration & Governance which was launched in 2019 and is designed to help aspirants to prepare for UPSC examinations holistically along with graduation. The Centre under the scheme Hoque-20 identifies 20 brilliant students who are given rigorous coaching on Civil Service Examinations. With several achievers each, Hoque 20 has also produced Toppers like Maria Tanim (APSC-2016).

Free Coaching

USTM provides free coaching to all the in-house aspirants of competitive examinations with eminent faculties, experts, etc., along with wholesome free refreshments.

Dedicated Library: A well-stocked library with the latest books, references, journals, and resources for competitive examinations, etc., is established for the students.

Resource Persons: Apart from the in-house faculty members, guest faculties, and experts from various universities, in-service/retired IAS/IPS officers, and young civil servants frequently guide the aspirants.

Door-To-Door Bus Services

Special Bus Shuttle services are provided to all the students who are availing of the coaching.

Awards for the Aspirants

Enrolled students or passed-out students (within 6 months) get back their entire fees from 1st semester to the last semester including Admission Fees. Alumni within 1 year of completing their master's get back 50% of their entire fees and 25% within 2 years. Student qualifying IAS gets Rs 5,00,000/-, IPS gets Rs 3,00,000/- and IRS & Allied Services gets Rs 2,00,000/-. Students qualifying in GATE get a cash award of Rs 50,000/-.

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Atmanirbhar Bharat Abhiyan and the Higher Education in India

Santishree Dhulipudi Pandit*

India's efforts and ambition of becoming self-reliant (*Atmanirbhar)* are not aimed at becoming self-centred or closed to the world. Rather when the Hon'ble Prime Minister Shri Narendra Modi called for *Atmnirbhar Bharat,* he was calling for India to become the producer and supplier *for* the world. India has the potential, capacity, human resources and aspirations to become a world power to promote peace, prosperity and happiness across the globe. Therefore, India is articulating the concept of *Vasudhaiva Kutumbakam*, meaning the world is one family, to give a message of peace, harmony, and sustainable living. To realize these potentials, the Government of India has undertaken the *Atmanirbhar Bharat Abhiyaan* on a mission mode. These goals have been incorporated into the agenda of India's G20 presidency to create self-reliance, to develop harmoniously with nature and for India to become the voice of the Global South while also engaging the Global North.

Are these goals achievable without developing a robust network of quality higher education institutions across the length and breadth of India? The answer is an emphatic NO, and that is why the universities and higher education institutions in India need to work together with the central and state governments as well as with industries and businesses to invest in capacity-building and expansion of existing higher education institutions and founding new ones in all nooks and corners of the country, especially in districts that remain away from accessing quality higher education. *Atmanirbhar Bharat* stands on five pillars: Economy, Infrastructure, Systems, Vibrant Demography and Demand.

The National Education Policy—2020 (NEP-2020) envisages holistic education and skilling at all levels of education. The National Education Policy (NEP) 2020 has given special emphasis on vocational education through integration and mainstreaming of vocational education with general education which will help students in acquiring various skills to meet the needs of the industries and to improve the quality of education. The transition of the market from a learning-based approach to a skill-based model has been attributed to the policy. NEP-2020 focuses on employability and acknowledges the role of education in providing students with the right skillsets. The vision of the government via this initiative is to meet the 2030 Agenda for Sustainable Development, which strives to ensure inclusive and equitable education as well as promote lifelong learning opportunities for all.

NEP–2020 promotes moving away from the conventional content-heavy and rote learning practice towards holistic learning. It instils a creative and multidisciplinary curriculum that focuses equally on other subjects such as humanities, sports, fitness, languages, culture, arts, etc. apart from Science, Mathematics, etc. NEP–2020 also recognizes the importance of soft skills such as communication, teamwork, problem-solving, decision-making, analytical thinking, resiliency, etc. as imperative life skills. The initiative works with an approach where academic knowledge is imparted. However, along with it, leadership skills are also inculcated amongst the students so that they can benefit ahead in their career trajectory. The National Educational Policy 2020 propagates experiential and skill-based learning.

It is said that the future of any country depends on the quality of education imparted to the next generation. Without a good education, the younger generation will not realize their true potential, and the country will thus be unable to attain its potential as a world power. While school education prepares younger students for life as adults, the training of human resource occurs at the higher education level. Therefore, looking at the demographic dividend in India today, it becomes all the more important to create opportunities for the younger generation to achieve professional and higher education so that they can be assets in the job market and contribute to the growth and development of the country.

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In demographic terms, India is a young nation and requires significant investment, expansion and capacity building in higher education if it has to fulfil the demands of its youth. In recognition of this need, the Government of India brought the National Education Policy (NEP), 2020, which promises universal, holistic, equitable and multidisciplinary education. The NEP 2020 aims to transform India's higher education to make it competitive and research-oriented and increase access to higher education for all. In addition, it encourages the opening of new universities and professional institutions of higher learning towards promoting an interdisciplinary approach to enable Indian youth to develop a multifaceted set of skills.

The University Grants Commission (UGC) has also been working to ease the norms and regulations for setting up foreign universities in India that could help bring quality international education to Indian students at affordable costs. However, certain challenges remain as far as encouraging foreign universities to set up campuses in India, especially the need to have regulatory frameworks for maintaining quality as well as affordability.

As India embarks on the need for *Atmanirbharta* in different fields, the role of higher education becomes even more important. For an *Atmanirbhar Bharat*, it is important to invest in capacity-building, encourage indigenous knowledge systems, develop ecosystems for innovation and excellence, invest in research & development and finally make them accessible and affordable for all. However, given the vast geographic expanse and the huge population, there exists a wide-scale disparity in higher education in India today. The disparity also exists in terms of quality education in science, engineering, management & medicine subjects and social sciences and humanities disciplines.

While it is important to encourage interdisciplinary approaches, especially in research, expanding professional and skill-oriented education in all fields, be it STEM subjects or professional courses, social science, humanities and arts. Both central and state governments must come together to develop good institutions in multiple fields across the country. At the same time, it is the need of the hour that private educational trusts and philanthropic organisations come forwards to invest in capacity-building in higher education in different parts of India.

There is also the need to improve the quality of teaching and research in our colleges and universities through regular teachers training courses, refresher courses and exchanges and interactions among faculty and students from different colleges, universities and institutions. Besides, there is a need to recognise and nurture talent and give them the best opportunities to grow and contribute towards excellence in all fields. Only by creating sustainable and nurturing ecosystems in colleges, universities and professional institutions can one expect a climate of excellence to be developed and nurtured in our higher education institutions.

Only with a concerted approach of all stakeholders can India realise the potential of the clarion call of the Hon'ble Prime Minister for *Atmanirbharta* and revive its civilizational role of a *vishvaguru*. It will prepare India @ 2047 during the *Amrit Kal* to face the challenges of Science and Technology in a holistic, multidisciplinary and interdisciplinary manner. This revives our tradition where invention and innovation go hand in hand with the spirituality as a way of life. ❑

Transformative Higher Education for *Atmanirbhar Bharat*: Reimagining the Universities of Future

S S Mantha*

A University is a community of teachers and scholars. It must nurture academic freedom. A student must explore the spirit of adventure and innovation in a university. Knowledge and learning are the media. A certificate of attainment is the fruit she seeks. The Boundary conditions, however, have been changing the contours of a traditional university. Some pressure points are a large number of students, inadequate faculty numbers, poor faculty quality and shrinking job opportunities. Each pressure point has a unique pressure release mechanism that is *Atmanirbharata.*

Atmanirbharata is Self-reliance. *Swavalamban* is self-sufficient and both are vehicles for happiness. Positive psychology, the basis for self-reliance helps us explore self-worth, self-expression, self-knowledge, and resilience, needed for self-acceptance. There is a certain conformity in our lives that can be boring. We can challenge that through self-reliance, self-trust, and individualism. Cognitive, emotional, behavioural, interpersonal, and practical skills help us in that pursuit. University education must adopt and adapt. It must teach reliance on internal resources to provide life with meaning and fulfilment.

Technology has disrupted everything in the last decade and that includes education. Digital transformation and massive cutting-edge automation have been the change agents. Industry 4.0 is reshaping university education. Ten major technologies that have changed many sectors, especially manufacturing around the world are Artificial Intelligence (AI), Machine Learning (ML), Robotic Process Automation (RPA), Blockchain, Internet of Things (IoT), Cognitive Computing, Intelligent Apps, Virtual Reality (VR), 5G and DevOps.

There is no equipment that we use today that is discipline specific. Multi-disciplinary is the new code. Whereas Telephone took 75 Years to develop, the Web took 7 Years, Facebook 4 Years, Instagram 2 Years, Chatbots 6 months and Pokémon Go only one Month. It is amazing to look back to 2006, when we did not have access to an iPhone, an iPad or a Kindle the virtual library of more than 1.5 million books. We did not know 4G or Instagram or Snapchat or even WhatsApp which we so extensively use today. 5G was unavailable till last year. Multi-disciplinary research is the key.

Atmanirbharta needs local research and development. Most Indian Universities do not connect with the industry for research. Research without patents and IPR's is a cause for concern. Innovation has always been on the side-lines. We have several prestigious Institutions like the IIT's which produce thousands of Ph. D's. Several papers are published in reputed Journals. The researchers are world-renowned and mix with the best across the Globe. However, there are almost no products that come out of our institutions.

We must encourage setting up institutions and societies on the Fraunhofer Model which earns about 70% of its income, through contracts with industry or specific government projects and the other 30% of the budget sourced in the proportion 9:1 from state Land government grants, used to support preparatory research.

We must set up Max Planck and Fraunhofer model institutions, which apart from supporting Make in India/Startup India initiatives could create new employment opportunities. A Make in India hub for productization must come up, that would promote massively new products and new job markets in various sectors like Defence, Railways, Agriculture, Healthcare, and Infrastructure.

The base of the pyramid of employment markets is being disrupted. It is shrinking with lesser numbers required at the base. Those perched higher need even higher-order skills. Today's skills have a shelf life. Students entering colleges now may end up working in completely new job types

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that don't yet exist. Today, new skills and improved cognitive abilities are required to succeed. Besides the technologies cited, abilities such as scaling IT infrastructures, cloud sourcing everything, reaching consensus on data and analytics, changing, and connecting processes from production to management, analysing performances or KPIs and creating appropriate ecosystems, and cooperating in multi-dimensional workplaces are all sought-after skills.

In the early nineties, the Japanese auto manufacturers occupied the first seven positions among the top ten manufacturers of the world, out-beating giants of the time like Ford Motors, Chrysler, and General Motors on cost-performance ratios. It was possible due to 90% outsourced manufacturing, to other countries. Digital manufacturing was the key. That disruption in the entire manufacturing supply chain is now transforming and evolving into industry 4.0.

Industry 4.0 creates an amazing hybrid of the Internet of People (IoP) and the Internet of Things (IoT). Hence, apart from technical skills, a student must possess abilities of complex problem solving, critical thinking, creativity, people management, high emotional intelligence, and coordination with others. The influencers of this change are AI, the globalisation of teams, and social media. A high level of skilling, upskilling and continuous reskilling is needed today. Universities must shift to interactive and immersive components of teaching and learning that address personal learning needs. Since not everything can be taught, acquiring micro-credentials or fractional credits is the future. Blended / Hybrid learning with cost-effective options must be explored.

The first industrial revolution used steam to generate power. whereas the second used gas to do the same. It also gave rise to telegraphs and railroads. The third or digital revolution converted analogue systems to digital. The fourth industrial revolution, based on self-optimization and self-cognition, is customised automation of manufacturing processes and flexible mass production technologies. This is *swavalamban* at its best. Like a student is at the centre of education 4.0, the customer is the king of industry 4.0. Industry 5.0 is about the '3P' bottom line. Profit-People-Planet.

Universities and Technical Institutions, some of them built more than a hundred years back, need to now relook at their business. Adoption of technology and quality need investments. The faculty too must be trained with compulsory internships. With ChatGPT like Chatbots available now, Google will soon be timed out. The current generation is extremely agile and informed. In a world, where industries are integrating the real and the virtual seamlessly, can the universities afford not to do so? It is now imperative that our universities and institutes add value to their business by collaborating with industries and the best from amongst themselves, lest they are ousted from their perch, with the entry of foreign university campuses and the digital/ virtual avatars of the future. Universities must accept and live with it. Rejecting and living without it is no longer an option.

Moving forward, in the quest for universities of the future, blended learning will have an important role. The future learning will be at least in part online, with some elements of student control over time, place, path, and/or pace. Remaining brick-and-mortar learning must be supervised along each student's learning path within a course or subject, which then can provide an integrated learning experience.

Complex problem solving, critical thinking, creativity, people management, coordination with others, emotional intelligence, judgement, decision making, service orientation, negotiation and cognitive flexibility are all the new age skills needed in addition to the domain skills. Not every skill is possible to be given within the confines of the universities. Much learning must happen outside the campus as much as happens within the campus. They must be easily accessed through various devices with learning analytics supported big data management, be able to blend online/offline learning, must be sharable in a collaborative spirit, and must be quality assured.

So, what must the Universities of the future look like? Blended learning for sure, will form a part of the new paradigm. Several iterations later, we may comfortably be using a 30:70 or 40:60 model of online-to-offline ratios. A future University must explore different organisational structures that will have different business models, will have

(contd. on pg. 41)

Transformative Learning: Unique in Equipping Learners with the Motivation and Skill to Build a Just, Equitable, and Sustainable Future

Jeff King* and Eric Kyle**

A singular aspect of Transformative Learning (TL) that distinguishes it from other approaches to instructional practice is its focus on helping students develop critical self-reflection (CSR) skills (Cranton, 2011, p. 76; Şahin & Doğantay, 2018, p. 103). Fook's contention (2004, p. 16) that "critical reflection holds emancipatory possibilities" is illustrated in action research conducted by Morley (2012). Thus, there are theoretical as well as empirical justifications for adopting a TL approach when trying to prepare students and graduates as contributors working toward a more just, diverse, and equitable future for all, which helps ensure a sustainable future. The trick, of course, is how to scale a pedagogy/andragogy that includes the development of students' critical self-reflection capacity when most faculty have never been trained in that aspect of student development. Indeed, many faculty see their roles only as helping students learn content. In such an environment, faculty professional development for TL must justify itself, be an inviting and positive experience, and exist as a scalable enterprise capable of reaching hundreds of thousands of faculties across the globe.

Brief Introduction to TL as Promulgated by Mezirow

Transformative Learning (TL) as a teaching/learning paradigm was initially developed by Dr. Jack Mezirow in the mid-to-late 1970s. As TL's foundational theorist, Mezirow's original conceptualization included a ten-step process through which adult learners would pass along a continuum that moved them from one perspective or worldview to a changed or expanded view regarding a particular topic or circumstance (Mezirow, 1978). The theory has evolved and developed in the years since Mezirow's introduction of it, but two concise definitions include Hoggan's (2016):

> . . . processes that result in significant and irreversible changes in the way a person experiences, conceptualizes, and interacts with the world (p. 21);

. . . and Merriam and Caffarella's (1999):

> . . . dramatic, fundamental change in the way we see ourselves and the world in which we live (p. 318).

It is precisely because TL results in fundamental change of perspective, even beliefs, about ourselves and our relationship with the world that it is such a powerful force for social justice, equity, and sustainability. Our societies are faced with what many consider existential crises (climate change and environment degradation, continued racism and othering, unjustly distributed resources, etc.) because intractable, limiting perspectives and worldviews remain lodged in the minds of our leaders and the populace.

Brown's research (2006) indicates that transformative andragogy (i.e., TL instructional approaches used with adults) can indeed move students toward social justice motivation:

> Findings indicate that participation in transformative learning processes and strategies can increase students' perceived growth in awareness, acknowledgment, and action toward social justice. (p. 700)

TL's process for prompting and inculcating a personal expansion or shift of consciousness to embrace the need for, and work to, accomplish social justice hinges on students' development of critical self-reflection capacity. University may be the final opportunity for this development and subsequent perspective shift to occur — if not at university, then where? How? If students come to us without a sense of duty and motivation to contribute to the social good, and we don't help them develop that, they will leave us the same way they entered, and current challenges and dire situations will remain.

An example of the role of critical self-reflection within a TL approach with social work students is described by Bay and McFarlane (2011). They observe

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that social work students' development of the ability to recognize their own and others' frames of reference and the dominant discourse in a community helps students work successfully for positive social change.

Broadly across Higher Education (HE), many (perhaps even most) doctoral programmes do not include courses on how to teach (e.g., Bonner, et al., 2020; Marx et al., 2016; Maynard et al., 2016). TL as a specific strategy, including how to develop students' critical self-reflective capacities and how to create good prompts that provide scaffolded opportunities for students to learn and practice this skill, is surely not generally part of the doctoral programmes that do include courses on how to teach. Indeed, there is literature suggesting that doctoral programmes can create transformative perspective shifts (e.g., Caruana, Woodrow, Pérez, 2020) but doctoral programme courses in how to teach well that are part of non-education PhDs will usually not mention TL, based on the author's broad experience in faculty professional development as a discipline.

Given the above, what must be done to ensure HE institution's graduate students are prepared and motivated to contribute to the social good? The line of reasoning that has brought us to this question is:

1. Solving existential challenges facing society means we have to 'do different' — we cannot keep doing what we're doing to get the different results we need.

2. One place we can and must 'do different' is higher education. If university students have not developed a social justice worldview by the time they get to our campuses (and it seems most entering students have not, based on reports of faculty who teach at TL-focused institutions such as the University of Central Oklahoma, Technological University of Dublin, and Universidade Presbiteriana Mackenzie — B. Wimmer, S. Thompson, J. Brunstein, personal communications, 2019-2022), university education may be the last chance for this development.

3. A pedagogy/andragogy exists— TL — that can help students develop social justice commitment.

4. Faculty must be trained in how to teach in a TL-focused manner so they develop their students' critical self-reflective ability as a key component to shifting a non-social justice perspective to one that embraces social justice.

There is at least one existing faculty development mini-curriculum that helps faculty learn how to implement TL-based instructional practice. We will introduce it later in this article.

Why TL is Uniquely Suited to Developing Learners' Motivation and Capacity to Contribute to Social Justice and the Social Good

When working with students to transition from non-social justice perspectives towards more social justice orientations, a TL approach is well suited for these purposes. So, how can we engage with students in ways that help foster such transformations? Educational research on transforming students' biases provides guidance for such strategies. By beginning with students' own inner beliefs and attitudes towards out-group members and facilitating their engagement with diverse communities, this literature provides insights into how we can journey with students toward sustainable community engagement for the greater social good.

According to social justice educators working with this approach, there are at least three sets of strategies that we can use in our courses to help learners develop their cognitive, motivational-affective, and behavioral capacities to contribute to the social good. Cognitive strategies which seek to raise the consciousness and awareness of students in relation to racism as well as biases more generally comprise a first strategy set to help learners build the capacity to improve the social good. As Freire (1970/2009, p. 47) pointed out, the oppressed are often "prescribed" into certain ways of thinking and doing by dominant groups. Numerous social justice educators maintain that such domination is particularly present in our corporate and educational systems (e.g., Sleeter et al., 2004; Wink, 2011, pp. 57, 79). Before one can engage with these biased systems, they must first become aware and critically reflective of them. In essence, it "entails unveiling myths created by the oppressors to maintain the status quo" (Sleeter et al., 2004). Such critical reflections, it is asserted, should not remain at an abstract level but rather engage in the very concrete and tangible forms of oppression that exist and are operative in our community (Seidl & Friend, 2002; Wink, 2011, p. 71).

A second set of strategies are immersion strategies. Central to these pedagogies is the concept of "solidarity" which can be understood as the willingness to enter into and share in the actual lived experiences of another person or community (Freire, 1970/2009,

p. 49). True solidarity, asserts Freire (1970/2009, p. 50), compels us to stand alongside one another and to work for the liberation of all. The purpose of such immersive connections with one another is to help us better understand the "characteristic ways of living and behaving" that each of us has (Freire, 1970/2009, p. 61). Such immersions also have the goal of fostering relationships that are genuine, mutual, and reciprocal (Sleeter et al., 2004). Pedagogies of immersion can therefore not only help students with their consciousness-raising but also to see nuances and complexities that stereotypes can mask (Coffey, 2010; Seidl & Friend, 2002; Smith-Maddox & Solórzano, 2002).

Finally, TL strategies can engage students in community engagement. These strategies are fundamentally oriented toward enacting some sort of practical transformation in the local community (Freire, 1970/2009, pp. 50-51). Following the philosophy of Freire, many of these pedagogies seek to liberate persons and communities into their fuller humanity, thereby changing the cultures and societies of which they are a part (Freire, 1970/2009, pp. 56-57). Furthermore, these pedagogies often invert traditional views of teaching and learning. Rather than perceiving educational institutions and professionals as the sole repositories and sources of knowledge, the community itself is valued for its own insights, ways of knowing, and approaches to changing the community (Freire, 1970/2009, pp. 53, 72; Ladson-Billings, 2009, pp. 126-128; Wink, 2011, p. 146). To engage in such transforming actions and help to address these challenges, pedagogies of community engagement may therefore take on a "praxis" approach to teaching. Defined by Freire as "the action and reflection of men and women upon their world in order to transform it" (Freire, 1970/2009, p. 79), praxis is an integrative blend of theory, action, reflection, and relationships that are oriented towards liberating our world (Kyle, 2011; Wink, 2011, pp. 73-74). At their core, pedagogies for community engagement may begin within the classroom but ultimately extend into the community in transformative ways that are more meaningful and relevant to students and their communities (Wink, 2011, pp. 24, 110).

How Improving the Social Good via TL Helps Ensure a Sustainable Future

When working with students to engage with global issues such as sustainability in transformative ways, it can be difficult to discern how individuals at a local level can make any kind of difference in the world. How might the teaching strategies above, which occur at a local level, contribute to ensuring a more sustainable future for our local communities, our nations, and our world more broadly? One way is to introduce them to the concept of Glocal Engagement.

The word *glocal* is a combination of two words that don't often go together: global and local. The term *glocal* merges these two levels together by encouraging us to "think globally, but act locally" (Yusuf, 1999). We would like to build on these concepts and adapt them for education by highlighting three aspects of Glocal Engagement, which are an expanded version of the three strategies from the previous section:

1. Global Consciousness Raising — Helping students be more aware of global social, political, and economic influences
2. Collaborations — Empowering students to identify wider movements and coalitions that are working to address specific issues, such as globalization and sustainability, at multiple levels (i.e., local communities, cities, states, nations, regions, continents, etc.)
3. Strategic Action — Working with students to support these wider social, political, and/or economic movements by engaging locally to make changes in one's community and beyond

How might such Glocal Engagement be implemented more practically in our courses? Consider Rodriguez Aboytes and Barth's (2020) article, "Transformative learning in the field of sustainability: A systematic literature review of more than 200 articles (1999-2019)." Focusing specifically on the global issue of sustainability, Rodriguez Aboytes and Barth sought to "investigate how transformative learning has been conceptualized and operationalized in education for sustainable development (ESD) and sustainability learning." They highlight several teaching strategies and activities that can help foster this, such as the following, which have been categorized according to our three Glocal Engagement areas:

- Global Consciousness Raising:
    - Drawing on learners' prior experiences with sustainability
    - Highlighting those communities that have suffered socio-ecological problems in the past

    - Engaging students in situations where they might face existential conflicts or moral decisions

- Collaborations:
    - Helping students form new social relations
    - Designing educational programmes abroad
    - Participating in activities in the local community

- Strategic Action:
    - Adoption of sustainable behaviors
    - Participation in decision-making processes
    - Creation of community-based organizations

The aspects of Glocal Engagement therefore provide one model for empowering students to be more engaged with these types of issues. As pointed out in the previous section, by doing this, students will be challenging their assumptions, biases, value systems, etc., as they work for systemic change. Such changes result not only in individual transformative learning but also alterations at broader levels of society.

An example of putting these three sets of Glocal Engagement strategies into action in our courses may be found in an article by Fortune et al. (2019) entitled, "Transformative learning through international project-based learning in the Global South." The authors describe a project-based senior capstone course in which students from Australia partnered with community-based organizations working in under-resourced contexts in India and Vietnam. Overall, some of the core outcomes of this course involved students increasing their cultural competencies, meeting service requirements for this discipline, project management and leadership skills, developing ethical conduct, service development, and community capacity building.

Following a students-as-partners model, students in this programme were required to work closely with the community organizations to develop programmes that would not only meet the current needs of the local community but also be sustainable once the students had returned to their home country after the 10-week internship. The resulting projects included developing volunteer programmes and recruitment strategies to attract occupational therapists to regions that have none as well as "the development of occupational therapy teaching resources for rehabilitation team members working with individuals following a stroke." As a result of this course, students reflected on the challenges of living up to partner expectations while also having to think creatively to meet the struggles that these communities were facing.

While this seems like a modest TL project, it exemplifies Glocal Engagement for the greater social good. Students were required to engage with all three of the Glocal Engagement strategies. They had to learn more about Global South perspectives and realities as well as their own Global North biases, thereby raising their consciousness in relation to these issues. They were required to collaborate with local community organizations in ways that did not force Global North values and beliefs but were more responsive to local cultures. Finally, students developed projects that were immediately relevant to these community organizations and were more likely to be sustainable upon their departure. Most importantly for this topic, these projects were oriented toward positively improving the health and well-being of these communities, many of which are marginalized. We can therefore highlight this course as an exemplar for Glocal Engagement for the greater social good.

How to Scale Faculty Professional Development for TL

Even with detailed examples about what a TL project could look like — as in the above example of Glocal Engagement by students — making the leap from understanding TL theory and the broad strokes about its distinguishing feature of critical self-reflection development among students to actually 'doing Transformative Learning' will be new to many, if not most, faculty. This is not necessarily the fault of faulty; as mentioned above, PhD programmes frequently don't include courses in how to teach generally, much less in how to teach using TL-focused instructional practice.

Another barrier is the assumption that can occur at the highest levels of institutional leadership that the need for faculty professional development ceases once the faculty member obtains a PhD. Former UCO President Dr. Don Betz, who remains active with the International Association of University Presidents, relates that many university rectors, vice chancellors, presidents, and others would often ask him after his presentations about TL why their faculty need professional development because almost all their

professors already have PhDs (D. Betz, personal communication, January 26, 2022).

Once the need for faculty training in TL-focused instructional practice has been acknowledged, however, then the challenge of finding this kind of professional development can be daunting. For various reasons, many institutions do not have teaching centers within which faculty development is based. Even if such centers exist, there may not exist expertise for developing TL-based practice among faculty.

There is, though, a hybrid Transformative Educator Programme (TEP) available on the Qedex platform. It is comprised of four courses, each of which can be completed in approximately three weeks. Each course contains four modules, and each module contains four topics. Across the roughly 12 weeks of the curriculum, five webinars occur: one at the beginning of the curriculum, and a webinar at the end of each of the four courses. Webinars allow for small-group reflective interchange and large-group debriefing. Community-building among faculty in the cohort occurs given shared experiences with the programme and reflective conversations with peers.

Built with scholar-practitioners in mind — those who want to implement TL in their own classrooms — TEP provides specific examples of classroom and course design activities that align with TL. Major segments of the programme deal with critical self-reflection and how to prompt and assess what it reveals about leaners' advancement toward transformative realizations, and with change agentry and advocacy for TL in higher education instructional practice.

TEP is mature, with several cohorts from various parts of the world already having completed TEP, and multiple cohorts in process as of this writing. An advantageous follow-on from the programme is that participants remain members of a global TL community of practice that is growing into the hundreds and soon into the thousands. TEP graduates (who receive certificates) from Indonesia, for instance, will be able to communicate with their own Indonesian TEP peers across their country and with TEP peers globally.

For purposes of this article, a full description of TEP is not appropriate. We use it as an illustration, though, of a robust solution already in existence for institutions and faculty that believe a transformative education approach can be powerful in motivating students and graduates to improve sustainability and the social good at glocal levels.

Concluding Thoughts

In this article we attempt to make the case that TL is well matched to helping students develop sustainability and social good improvement mindsets and motivations. A broad range of literature supports this contention, including Finnegan's (2023) excellent review of Transformative Learning for Social Justice (TLSJ) from a theoretical perspective and which includes a call for more research, conversation, and investigation of TLSJ within the TL community. In addition to Finnegan, one of this article's co-authors makes the case for TL as an efficacious teaching/learning approach for inculcating a sustainability ethos among students (King, 2022).

Assuming agreement that TL is a 21st century pedagogy/andragogy suitable and proven to help higher education institutions graduate students with sustainability and social good motivation and capacity, the need for faculty professional development in TL is obvious. We have briefly introduced a scalable solution that also provides a glocal community of practice within which TL for glocal sustainability and social good improvement can be discussed and researched in collaborations that could yield both scholarship and praxis on Transformative Learning for sustainability and improvement of the social good.

We conclude by noting and echoing Ukpokodu's observation (2016, p. 114) that we all have "the ethical and social responsibility to teach to transform."

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An Approach to Reimagining a National Curriculum Framework for University Education

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This article is being published here with a purpose to initiate the creation of a National-level Document on 'Re-Imagining National Curriculum Framework'. The process of creating that document would be similar to the one employed for the National Assessment and Accreditation Council White Paper–2022, 'Re-Imagining Assessment and Accreditation in Higher Education in India' with principal authors, co-authors, secondary authors, and reviewers.(http://naac.gov.in/images/docs/notification/ReImagining_Assessment_and_Accreditation_in_Higher_Education_in_India_2207202.pdf)

Scholars interested to join the team for joint creation of full version of the document may write to any of the authors of this article on their e-mail ids provided in the author's details. This article may be taken as an outline of the proposed document.

National Curriculum Framework – What it Ought To Be & Current Lacunae

A National Curriculum Framework (NCF) is one that ought to serve as a *guide* for institutions and educators to design and deliver high-quality education programs that align with the needs of society and the economy. It can help ensure consistency and coherence across institutions and programs, while also allowing for experimentation and innovation in curriculum design and delivery. The specific contents and structure of an NCF would typically include guidelines on the following aspects:

1. Purpose of Education
2. Goals of Education
3. Curriculum, Syllabus, and Curriculum Framework (CF).
4. Quality Assurance
5. Teaching and Learning Resources
6. Professional Development

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Following the NEP recommendations, the NCERT has prepared a curriculum framework for school education *(https://ncf.ncert.gov.in/#/)* and the National Council for Teacher Education has prepared one for Teacher Education (*https://ncte.gov.in/website/PDF/NCFTE_2009.pdf). However, an ideal National Curriculum Framework (NCF) must be one that provides guidance for curriculum design right from School Education to University Education in an integrated manner.* UGC is currently in the process of creating a National Higher Education Framework for Higher Education (NHEQF) *(https://www.ugc.ac.in/pdfnews/2142241_NHEQF-Draft.pdf*). However, the qualification framework is just one component of a curriculum framework. The ideal NCF must focus on the quality of education, going beyond qualifications and skills, and, as part of that provide a framework for school education, university education, etc. For this, we need to transform the current habit of thinking in silos (such as school education, university education, teacher education, and so on) to integrate all aspects of education under a single umbrella. We also need to rethink the current classification of academic disciplines, which is another cause of the fragmentation of understanding, inquiry, thinking, and education itself.

The Need for National Curricular Framework for University Education (NCF-UE)

Our attempt in this article is to outline an approach to an NCF-UE, which can then form the basis for integration from school education to higher education.

Current documents on curriculum design do not provide adequate guidelines for ensuring the following components in curriculum design in University Education:

Higher Order Cognition (NEP 2020; NAAC White Paper 2022, Section 2)

Educatedness & Citizenry

Multi-disciplinary and Trans-disciplinary Integration

Integration of the Ancient and Modern Knowledge Systems

Another motivation for the proposal for NCF-UE is the need to address a serious gap in the existing proposals for Curriculum Frameworks. NEP 2020 has triggered fresh thinking on Higher Education Institutions (HEIs) in India. Drawing on its recommendations, the NAAC White Paper (NAAC-WP) on Assessment and Accreditation of HIEs (2022) recommends that HEIs transform themselves into Centers of Learning that prioritise outcomes of learning *that would be of value to learners throughout their lives*. Such transformation requires paying attention to quality improvement along two strands:

(i) Curricula for HEIs

a. Student Learning: curriculum design geared towards the lifelong value of the learning outcomes; and

b. Facilitating Learning: effectiveness and efficiency in helping students to learn what goes into (Ia).

(ii) Administrative Policies

Enabling, monitoring, and regulating

The value of (II) depends entirely on what it contributes to student learning. Therefore. it is important that (II) be maximally aligned to (I), and does not become an obstacle either to the vision of the quality of student learning outlined in NEP 2020, or to the learning and educating processes themselves. This article is a step towards addressing these lacunae and ensuring maximal coherence between the different aspects of quality education in our country, specifically in higher education.

Curriculum, Syllabus, and Curriculum Framework

What is a Curriculum?

The term curriculum is typically associated with an educational program (e.g. B.Sc. Zoology, B.Sc. Botany etc.). The components of a curriculum are:

A) The SYLLABUS — The WHAT — of the program, which specifies the outcomes of learning expected of those who successfully complete the program. It would include all that is to be nurtured through the educational interventions of the program: information; understanding; skills and capacities; and habits of thought and action that the learners are expected to develop.

B) An EDUCATIONAL PHILOSOPHY — the WHY — that specifies the purpose and function of the program as a whole

C) The PEDAGOGICAL STRATEGIES — the HOW — to achieve the aims specified in (A)

D) The ASSESSMENT STRATEGIES to find out how well the learners have achieved (A)

The enabling components — administrative policies, regulations, infrastructure, and funding — lie outside of the curriculum proper.

What is a Syllabus

A syllabus as envisaged in (A) in the previous section is a Program Final Syllabus (PFS), which specifies the outcomes of learning that are expected of the learners at the end of a program. The purpose of a PFS is to align the subject-specific syllabi (e.g., the syllabus for science) and year-wise syllabi (e.g., syllabus for science for grade 8, or the syllabus for Physics for undergraduate 1st year) to a core set of learning outcomes, without specifying the details. How the PFS would be implemented in a university program or a school program would depend on the specific context in which it is implemented.

What is a Curriculum Framework?

Different educational programs would have different curricula, for instance, the various Bachelor's programs: the curriculum for MBBS is different from that for BAMS, LLB, B.Eng., B.Tech, BA, B.Sc., and so on. However, they all have something in common, namely, a framework. Of such a framework, we may say: *that it is a guide for curriculum designers in constructing a curriculum, including a set of ideas, assumptions, concepts, and so on, as options to choose from.*

The explicit statement of the components of a curriculum as in (A)-(D) in section 2.1 is itself part of a CF, to guide curriculum design for an entire system of education from Class 1 (Primary school) to Ph.D. (Graduate school). [Within such a broad framework,

CFs for school education and higher education may each need additional specifications.]

For instance, if we decide that every Bachelor's program in the country must have a General Education (GE) component, the NCF-UE for Bachelor's Education should guide the design of the GE curriculum, as well as the specialised components of each of the various Bachelor's programs, specifying (A)-(D) for each component, and for GE.

Thus, in other words, a curriculum is a *detailed specification* of the components (A)-(D) for a specific educational program, while a curriculum framework is a *guideline* as to what could go into the components (A)-(D) in such an educational program.

Curriculum Frameworks for University Education

Just as the design of a Curriculum for any program is embedded within and shaped by a CF, the design of a CF itself is embedded within and shaped by a set of broader considerations, which can be articulated as:

(1) A value system of life should specify what the human species ought to value, and how those values should be prioritised.

What value system should a CF adopt?

(2) The value system that a CF adopts, guides what is taken as the purpose of education, including the education that takes place in the family, community, peer groups, and so on).

What should the CF take as the purpose of education?

(3) Within (2) what should we take as the function of institutionalised education?

(4) Within (3) what should we take as the function of Higher Education?

(5) Within (4), what should we take as the function of University Education?

(6) Within (5), what should we take as the function of a specific program?

These questions can be visualised in terms of concentric circles (Fig. 1) that represent the general perspective in which a BSc program, for example, is embedded.

What should go into the value system that forms a foundation for education? Consider two factors: as members of the human species, we must collectively strive for a future in which every human being has (i) the material resources to lead a happy life; and (ii) intellectual well-being to the extent that is satisfying for the individual.

These two factors — material/economic and intellectual wellbeing — would then be part of that value system (the outermost circle in Fig. 1).

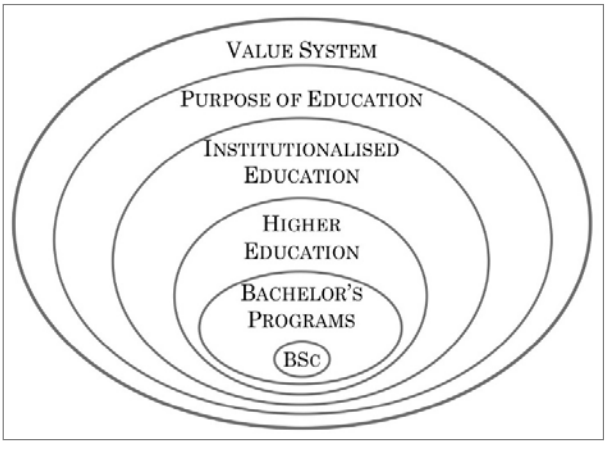

Figure 1 Representation of Curriculum Framework for university education through concentric circles

In higher education, we must note a difference between the two factors, distinguishing *university education* (including *professional programs* such as medicine, engineering, and law) from *vocational education*. It is essential for human societies to offer training that equips individuals to make a decent living, by training them in the skills for a specific vocation, whether as a carpenter, a beautician, an electrician, or a cobbler or in other skills that lead to an income. Specific skills are not restricted to programs in vocational training; they are relevant in basic research and professional programs as well.

A crucial question that must be addressed is: Do the *purely skill-based courses* for vocational training fit with the university space? The answer would depend on what we mean by the term 'University Education', and the value system underlying it. Broadly speaking, there are two positions on this issue:

Position A: The function of a university is to *train* the young to meet the demands of *manpower for the industry/corporate* sectors, such that they contribute to the *economic*

well-being of themselves as well as that sector.

Position B: The function of a university is to *educate the young such that they strive to contribute to the well-being of the individual, society, nation, the human species, and the planet with all its creatures, along the physical, socio-emotional, economic, intellectual, ethical, aesthetic, and spiritual* dimensions.

Position A is popular among those who prioritize income over educatedness. However, both NEP 2020 and NAAC-WP 2022 (Section 2) advocate position B. Section 2.5 of NAAC-WP, titled "Employability, Well-being, and the Purpose of Education," outlines the reasons for rejecting position A. In what follows, our proposals would be based on position B.

An Example of a Curriculum Framework for General Education

Preliminaries

Adopting one of the important recommendations in NEP 2020, NAAC-WP proposes that:

- the nurturing of Higher Order Cognitive Capacities (HOCC) must be viewed as a strand of both GE and Specialised Education; and
- GE must be compulsory for all Bachelor's programs.

In this section, we outline a CF for the design of GE for Bachelor's Programs, as one of the components of a CF for Higher Order Cognition.

As stated in section 1, the components of a curriculum include:

A) The Program Final Syllabus

B) An educational philosophy

C) The pedagogical strategies

D) The assessment strategies

In what follows, we will spell out a framework for syllabi, pedagogies, and assessment, with an underlying educational philosophy. But first a few words about the proposals in NAAC-WP. Among the learning outcomes that it recommends as part of General Education (GE) for Bachelor's programs are:

A. Academic Intelligence
B. Pragmatic Intelligence
C. Ethical Intelligence
D. Physical Intelligence
E. Social Responsibility
F. Societal and Emotional Intelligence
G. Aesthetic Intelligence
H. Spiritual Intelligence

A fully fleshed-out CF for GE must include all the strands in A-H. For the purposes of illustration, we will work out the framework for (A). Some of the components of Academic Intelligence are:

1. *Independent learning, reading, and communication*
2. *Information and Understanding*
3. *Construction and Evaluation of Knowledge*
4. *Attitudes, Values, and Habits of Mind*

[For details, see NAAC-WP 2022, Section 2.3]

Of these, we provide details of (3), which we may call Academic Inquiry and Critical Thinking.

A Programme Final Syllabus for Academic Inquiry and Critical Thinking

A Programme Final Syllabus (PFS) is a specification of the learning outcomes that we expect students to have achieved by the end of a program. By the end of a Bachelor's Program, regardless of their specialisation, we expect students to have achieved the following outcomes of learning covering Academic Inquiry and Critical Thinking (AICT):

1. the capacity for critical thinking, inquiry, and integration, which includes thinking like a mathematician-philosopher-historian-scientist, without requiring specialized knowledge;
2. the capacity to arrive at conclusions through careful reasoning;
3. the capacity to appreciate the world of ideas, and critically engage with those ideas, including the beauty of a mathematical proof, or the wonder as well as heartaches of the process of discovery,
4. the capacity to gather data to test an empirical claim;
5. the ability to sift away propaganda, myths, and dogma in search of truth in an age of fake news;

6. the capacity to reason and to spell out the steps of reasoning in a variety of contexts;
7. the capacity to make informed rational and ethical decisions based on ethical principles shared across human communities;
8. awareness of cognitive capacities such as perception, introspection, attention, intuition, insight, imagination, memory, and problem-solving;
9. the capacity to pursue courses of action to achieve the goals derived from one's value system, and critically examine the rationality of the link between actions and the value system they are grounded in.

The above set of qualities is an example of what a CF should look like, with clear and precise statements on what we need to aim at, while providing sufficient freedom for customization of its design, depending on the context and other factors.

To illustrate, let us take the capacity to arrive at conclusions through careful reasoning ((2) above). This specification does not prescribe any particular set of readings to develop the capacity for reasoning. It does not even tell an HEI or a vertical within an HEI which domain of knowledge to take as the practice grounds. Reasoning can be introduced to students through a selection of appropriate fields of study that lend themselves to different forms of reasoning: geometry, physics, chemistry, biology, sociology, history, medicine, engineering, law, or management.

As mentioned earlier, NAAC-WP (2022) points to the need to develop an NCF to design the curricula for GE, with HOCC as one of its strands. A similar CF would be needed for Specialised Education as well.

If we design a CF that ignores some of the major components of the curriculum and focuses solely on regulations and governance, chances are that there will be a misalignment that places obstacles in the journey towards realising the dream of NEP (2020) and NAAC-WP (2022). Hence the need to initiate a nationwide discussion on *re-imagining curricula and CFs*.

As part of the attempt to create CFs for GE and specialised education, it is important to revisit the conventional classification of academic knowledge as mathematics, sciences, social sciences, and the humanities. Implicit in this classification is the assumption that the so-called 'social' sciences (e.g., psychology, sociology, economics, linguistics, history, and so on) are not sciences. The article "Advocacy for an Institute of Human Studies: Need to Think beyond STEM" by Tara Mohanan, Vigneshwar Ramakrishnan, K P Mohanan and Bhushan Patwardhan (EPW 2022: *https://www.epw.in/journal/2022/50/alternative-standpoint/advocacy-institute-human-studies.html)* argues against this assumption, proposing an alternative classification in which the physical sciences, the life sciences, the mind sciences (e.g., cognitive sciences), and societal sciences are all sciences, and the human sciences is the integration of the scientific study of what is unique to the human species along the dimensions of life, mind, and social organisation.

The Pedagogical Component

Above, we spelt out some of the details of the components of a Program Final Syllabus (PFS). We now turn to a possible framework for designing the components of pedagogy. We will articulate it only at a general level such that it applies to pedagogy in all curricula, at all levels of UE. Pedagogy has two subcomponents: that which is employed:

- in-class sessions (whether in-person or online), and
- in learning resources (whether textbooks, other readings, videos, or audio).

The pedagogical strategies we outline below are relevant for facilitators of class sessions (teachers, lecturers, professors, and so on) as well as designers of learning resources (curricula, syllabi, textbooks, and so on).

Exposition-Based Pedagogy (EBP) and Task-Based Pedagogy (TBP)

The very first issue that the pedagogical component of a curriculum must consider is whether to use Exposition-Based Pedagogy, or Task-Based Pedagogy, or both in tandem. Suppose we want students to be able to engage in different kinds of reasoning (deductive/inductive/abductive…), with a conceptual understanding of these forms of reasoning. It is clear that for the purposes of the *abilities*, we must employ a Task-Based Pedagogy in which students learn by doing, not by reading about reasoning or listening to lectures about it. However, the best pedagogy for developing an *understanding* of the concepts that underlie the abilities would require us to use some amount of exposition.

Pedagogy Based on a Flipped Classroom (FCP)

The exposition of the concepts of reasoning can be provided either through a class session (in-person or online) or through written exposition (readings), a video, or an audio recording. Which of these strategies should we use? The traditional strategy is to use the classroom for the *initial presentation* via exposition and use the learning resources (readings, videos, or audio) for *practice* and *consolidation*.

An alternative is the *Flipped Classroom Pedagogy* — a flipping of the roles of the facilitator-in-the-classroom and the learning-materials-outside-the-classroom. Students receive the learning resources (readings/videos) as material to prepare for the class session. They read/watch the material on their own, discuss it in their groups outside the classroom, and come to the class session prepared for further discussion in the larger (entire class) group. The facilitator then goes beyond what the learners have learnt on their own from the resources, responds to their questions, provides help with what they have not understood, and further enhances their learning through interactive tasks and consolidation.

The value of FCP lies in helping learners develop the capacity for *independent learning* as an important component of Higher Order Cognition.

Experiential Learning Based Pedagogy (ELBP)

Humans acquire knowledge from experience (including observation), testimonies, reflection, and through reasoning. From observing flowers, we learn that they come in many colours. We learn from our experience that honey is sweet, that the juice of lime is sour, that we get hungry if we do not eat anything for a long time, and that stubbed toes are more painful than pinpricks. But we learn that a cobra bite can be fatal not from the experience of getting bitten by a cobra and dying, but perhaps from observing someone getting bitten by a cobra and dying, or from stories others tell (spoken and written testimonies).

To turn to reasoning, suppose we see Zeno and Apollo standing side by side. Our sense perception tells us that Zeno is taller than Apollo. On another day, we see Zeno and Athena standing side by side, and our sense perception tells us that Athena is taller. Given these two pieces of knowledge, we ***infer*** that Athena is taller than Apollo, even though we have never seen them both at the same time. We make such inferences from testimonial knowledge as well. Suppose a textbook says:

All vertebrates are eukaryotes.

All mammals are vertebrates.

All birds are mammals.

Zeno is a bird.

From these statements, we infer that Zeno is a eukaryote, even though the textbook does not say that explicitly. Our knowledge, depending on its source, can be experiential, testimonial, or inferential. The central idea of Experiential Learning Based Pedagogy (ELBP) can now be articulated as follows:

Wherever possible, testimonial knowledge must be supported by experiential knowledge and/or inference.

In the context of education, this means:

When a textbook or teacher advances a knowledge claim (an assertion to the effect that such and such is true or such and such is false), that assertion must be rationally justified on the basis of the learner's experiential knowledge and/or reasoning.

If we accept this pedagogical principle, it has profound consequences to curriculum design. It means that assertions such as the following, which children learn in school, must be accompanied by reasons (arguments and experiential evidence) for accepting them as part of their 'knowledge':

- The earth is round and revolves around the sun.

  (But experience tells us that the earth is flat and stationary.)

- Air is a mixture, and water is a compound, while iron and gold are elements.

  (But many ancient bodies of knowledge take air and water to be elements, and but not iron or gold.)

- Matter is not infinitely divisible; the process of division comes to an end when we get to an indivisible unit of matter. (e.g., Democritus in ancient Greece, Kananda in ancient India, John Dalton in the 19th century)

  (But according to Aristotle, all matter is infinitely divisible.)

These are just a few examples to illustrate the consequences of the commitment to ELBP.

Inquiry-Based and Inquiry-Oriented Pedagogies

Inquiry-Based Pedagogy (IBP) uses inquiry activities as a *means* to help learners *understand a given body of knowledge*. This is distinct from *Inquiry-Oriented Pedagogy* (IOP)**,** whose *goal* is for learners to develop the *capacity for inquiry*.

Suppose a teacher or textbook presents phenomena such as the daily and yearly cycles of temperature, the duration of daylight, of the relative position of the Sun against the horizon, and the like, and guides learners to construct a theoretical explanation within the heliocentric theory for those phenomena. The aim of this activity in Inquiry-Based Pedagogy would be to help the learners understand the heliocentric theory. Adopting IBP does not ensure that learners would be guided towards *constructing an explanation* for the phenomena outside of the heliocentric theory, say, that of the geocentric theory, and choosing between the two.

In contrast, IOP would include the activity of constructing an explanation of those phenomena on their own. This could result in the learners constructing some version of either the geocentric theory or the heliocentric theory, or a combination. The goals of IOP would be satisfied if the learners construct a geocentric explanation, even though we currently judge it to be false. This is because the inquiry activities in IOP aim at developing inquiry *abilities*, not at getting the learners to believe what we believe to be true.

Illustrative learning resources that aim at the abilities of Inquiry and Critical Thinking, that could benefit Bachelor's level learners include:

- Constructing Theories: A Case Study in Geometry (*https://www.thinq.education/post/constructing-theories-a-case-study-in-geometry-with-an-extension-to-biology)*
- A Theory of Motion (*https://www.thinq.education/post/a-theory-of-motion)*
- For Master's and PhD students, the extension of Inquiry and Critical Thinking as a trans-disciplinary introduction to research is provided by: Introduction to Research (https://www.thinq.education/introduction-to-research)

Other Pedagogical Strategies

In the preceding sections, we presented an outline of some of the pedagogical strategies that a curriculum can employ. This inventory is hardly comprehensive. Strategies that we have not discussed include Problem-Based Learning; Project-Based Learning; Activity-Based Learning; Hands-on Learning; Interactive Learning; Collaborative Learning; Debating; Buzz Groups; and several more. Depending on our educational goals, any of these pedagogies can be combined with the ones we have discussed.

Assessment

Purpose of Assessment

Any discussion of student assessment must begin with clarity on the purpose of the assessment. What is the purpose? Is it to assign marks or grades to learners on the basis of their performance? This is called ***Summative Assessment***. Or is it to diagnose the gap between what they have learnt and what we expect them to have learnt, in order to provide feedback to guide their further learning? This is called ***Formative Assessment.*** In formative assessment, there is no need to assign marks or grades. And assigning marks or grades without constructive feedback would be pointless.

(See "What is the difference between formative and summative assessment?" at *https://www.cmu.edu/teaching/assessment/basics/formative-summative.html)*

If the purpose is grading or assigning marks for the purposes of certification, there are two options, described in the literature as *Criterion Referenced* and *Norm-Referenced* assignment of grades/marks.

In criterion-referenced grading, the grades/marks are assigned on the basis of a set of clear criteria. For instance, in a multiple choice question, choosing one of the options is taken as 'correct' and the others as incorrect. Correct answers are given full marks and incorrect answers are given zero or negative marks. For questions that require longer answers, the criteria would clearly specify which answers deserve an A, which deserve a B, and so on. In such a system, it could be that 80% of the learners in a strong cohort score an A grade, and 80% of a weak cohort get a D grade.

In Norm-Referenced grading, on the other hand, we specify what percentage of the cohort

should be assigned an A, what percent a B, and so on. In this system, it can happen that a student who gets an A in a weak cohort would get a D in a strong cohort. (See "Criterion and Norm-referenced Score Reporting: What is the difference?" at *https://www.michiganassessmentconsortium.org/wp-content/uploads/LP_NORM-CRITERION.pdf)*

Format of Assessment

Terms like Multiple Choice Questions (MCQs), True or False Questions, one-word questions, short answer questions, and essay-type questions describe the format of assessments. See "Exam Questions: Types, Characteristics, and Suggestions, "at *https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/developing-assignments/exams/questions-types-characteristics-suggestions*

Design: The Learning Outcomes that the Assessment Addresses

A particular assessment format can be used for probing diverse learning outcomes. For instance, the MCQ format can be used to assess recall of memorised information; recall of memorised terminology without understating; mechanical application in familiar scenarios; innovative application in novel scenarios; reasoning abilities; reading abilities; critical thinking and inquiry abilities; and so on.

The design of assessment tasks is fundamental to the purpose of finding out whether the learners have acquired what the syllabus specifies, and how well they have acquired it. As an example, see "Entrance Examinations in Science and Technology," at *https://www.currentscience.ac.in/Volumes/99/10/1321*

An Action Plan

What we have outlined above is an outline of a full paper. We expect the full version to integrate the different pieces of NCF. Once we have created a full version of NCF-UE with the help of other contributors, our plan should be to proceed to the integration of NCF-UE with NCF-SE and NCF-HE as well as with NHE-QE, resulting in a clear specification of NCF itself, such that all these documents would form part of a single NCF document. Such an attempt should also be based on a clear understanding of what doesn't come under an NCF, namely, regulations, gross enrolment ratio, employability, MOUs, and so on. It is necessary, the connections between such issues and NCF can be handled in a series of Annexures.

For these attempts should be meaningful, we believe that the focus should clearly be on what NEP-2020 and NAAC-WP 2022 point to the purpose of education, the learning outcomes that we aim at, Educatedness, and Higher Order Cognition. ❑

(contd. from pg. 27)

cooperative structures enhancing interdisciplinary learning and have new concepts for faculties and departments.

Future universities must adopt quality assurance as a way of life, guaranteeing educational services rather than falling back on rankings, ratings, and outdated accreditation procedures. The examination offices will have new roles with students opting for flexible degrees, designer degrees or certifications, and even provide opportunities for acceleration in education according to fast innovation cycles.

Teaching methods would have to change with new teaching concepts (e.g., flipped classroom) and new teaching infrastructures (e.g., equipment for virtual worlds). Even digital rights management would be extremely important in the evolving new world order in education. Teachers will have to transform from being teachers to guides to mentors. They will have to swear by *Atmanirbharata*.

Virtual labs, next-generation labs such as Code labs, Pop up studios, Cloud innovation labs, Gaming garages, AR/VR Studios, Makerspace, Innovation/ Venture development centers, AI and Robot parks will have to be a part of the new learning ecosystem even as learning itself transforms from massive to personalized.

Adi Shankaracharya said that education is the realization of the self. That is *Atmabodha*. Universities help us do it. Time changes things, but actually, we have to change them ourselves. That is *Atmanirbharata*. ❑

Strategic Input of Education for Sustainable Development in Higher Education Curriculum: Focus on Learning Outcomes

Kalyani Samantray*

The Sustainable Development Goals (SDGs) published by the UN (2015) concern the long-term ecological well-being of the earth as a whole. For the impact of the SDGs to be equitable for communities, two essentials must be in place: i. development of awareness regarding the goals from an early age for their implementation that are achievable only through a holistic inclusion of the same in educational systems.

Subgoal 4.7 under SDG Goal 4, the Education SDG, compels that "by 2030 all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development [ESD] and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity […]" *(http://en.unesco.org/sdgs/ed)*. Keeping the two essentials in view, i.e., awareness and inclusion in the curriculums, this paper discusses how ESD can be incorporated in university-level literature and language courses for effective outcomes through student involvement.

Sustainability in all aspects of life has now occupied a prime position in the education agenda of the Government of India projected through NEP 2020. In awareness of sustainable living and its inclusion in the curriculums, this paper discusses how ESD can be incorporated into university literature courses for effective student engagement and appropriate outcomes.

Although all subject areas can include ESD to benefit from the sustainable dimensions it offers, my focus here on literature courses is justified by my long-standing literature teaching experience at the university level. Additionally, I was actively involved in the Times Higher Education (THE) Impact Ranking for universities between 2020-22. The core ideas of some of the important ESD reports and research are presented below.

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> "ESD is about the learning needed to maintain and improve our quality of life and the quality of life of generations to come ... ESD enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future" (Sustainable Development Education Panel Report, 1998).

The Council of the European Union maintained that "ESD is essential for the achievement of a sustainable society and is therefore desirable at all levels of formal education and training, as well as in non-formal and informal learning" (2010). UNESCO has projected ESD in the sense that it, "allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. ESD means including key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption. It also requires participatory teaching and learning methods that motivate and empower learners to change their behavior and take action for sustainable development. Education for Sustainable Development consequently promotes competencies like critical thinking, imagining future scenarios, and making decisions in a collaborative way. Education for Sustainable Development requires far-reaching changes in the way education is often practiced today" (2014).

As the documents noted above suggest, academics willing to embed ESD into their curriculum need to grasp as a perquisite the chief elements of sustainability (Jones et al. 2010; Murray, 2011; Sterling 2012). We also need to recognise that regulations are not enough unless we modify our educational goals to dovetail into ESD.

Major literature on SDGs (Stephens et al. 2008; Fuso-Nerini et al. 2017; Sullivan et al. 2018; Vilalta et al. 2018; Rosen et al. 2020; Fonseca et al. 2020; Perovi'c et al. 2020; The Sustainable Development Goals Report 2022) have mostly discussed the

development of generic sustainability skills, such as knowledge, skills and values. Universities need to stipulate what exact sustainability attributes they want to instil in their students. By the time these students graduate, they ought to be equipped to deal with what Sterling (2012) terms the 'triple crunch' of climate change that may lead from negativity to sustainable use of energy and economic security.

Being cognizant of the urgency of sustainability requirements, a majority of Indian universities have started to put into practice ESD in their courses. Yet, a lot is still to be achieved, particularly in literature courses.

Understanding ESD

Sustainability and ESD are concepts that may prove confusing for academics while contemplating to include these aspects in their curriculum, and also for intended learning outcomes. University teachers need to have a suitable practical foundation regarding the main components of environmental, social, and economic sustainability in order to embed them in their particular courses.

In Sterling's opinion, ESD is the "kinds of education, teaching, and learning that appear to be required if we are concerned about ensuring social, economic and ecological wellbeing, now and into the future" (2012:4). A range of readings is available to acquaint oneself with the key notions of ESD in fundamental texts of Davis 2005; Ballantyne et al. 2006; Stibbe 2009; Jones et al. 2010; Murray 2014; Hedefalk et al. 2015; O'Flaherty et al. 2018; Rafael et al. 2022, among many others. Acquaintance and reflection on the concept of ESD, discussions with colleagues and other stakeholders, such as students, parents, and university authorities, and consultation with ESD experts can identify the sustainability issues to be addressed, and produce a pathway to initiate ESD into our curriculum.

Literature Courses and ESD

Reading literary texts with eco-centric perspectives is expected to structure both teachers' and students' beliefs and attitudes to support a sustainable society. Compared to non-literary texts, literary texts depict abundantly the values of nature, environment and sustainable coexistence. However, the anticipated connection and outcomes of ethical behavior do not really happen every time (Keen 2010; Serpell 2014), because reading is mostly an indirect experience of nature and the environment, and does not necessarily correlate course-related interactions with practical environmental problems to create pro-sustainability conduct among students. Also, caring for the ecosystem and sustainability practices have never been the targeted learning outcomes of university literature syllabuses.

Since the problems delineated above are not quite obvious to course designers, implementors, and takers for steps towards action-oriented competencies, there has arisen now a felt requirement to make the facets of sustainability distinct for all the stakeholders. A clear comprehension of these aspects to conceptualise how literary scholarship can relate directly to sustainability outcomes is the essential next step for literature courses. Indeed, the linkage gap between ESD and literature courses provides the opportunity to restructure the syllabuses with fresh outlooks for fresh effects compared to what has been happening in such courses.

ESD through literature courses needs to go deeper than the facile association that exists between literary texts and the course takers' environmental ethics. Education, as a whole, including literature courses, must create a principled student attitude for sustainability, a mindset that realizes "the needs of the present" and does not jeopardize "the ability of future generations to meet their own needs" (Report of the World Commission on Environment & Development 1987, p. 16). Arguably, assuming that through literature, readers become sentient of, and develop concern for environmental issues, it is not evident that this would automatically inspire them to practice sustainable routines outside the classroom.

ESD is not a 20th century ground-breaking concept if we take into account ancient cultures of sustainability all over the world, and, in particular, the Vedic Gurukul pedagogy. Princes and commoners in the *Gurukuls* underwent the lived experience of caring for ecology with a deep respect for all living and non-living entities. Since ecology was not limited to the chanting of the Vedas or reading the literature on it, these students continued the sustainable practices as their habit during their time in the Gurukul that transferred to their daily life after graduating from the Gurukul and entering into the *garhastya* life. This sustainability equation has not changed over the centuries. What is learned and

practiced as *normal* should continue as a lifelong routine.

The critical dimensions of ESD can foster long-term sustainability competences through reading literature, without downgrading their literary 'values'. Rather, ESD can draw better attention to these values to be translated into action in the real world. This article will explore what the pedagogically worthwhile connections between literature and ecological thinking can be, and how literature courses can take advantage of these. To approach the issue of what literature courses can do for sustainability, we need to, first, explain certain basic assumptions about how literary texts may be interpreted. These interpretative processes can create the base of sustainability competence.

The dynamics of theories, such as the New Critical assumptions, the Reader Response perspective, the Critical Discourse Analysis, Ecocriticism and many such other theories, demand the willingness of a reader to be disturbed by a text in unpredictable ways. This is a reparative process that entails finding ways to engage with texts for alternative interpretations from the ones already *given*. Felski argues that to invigorate literature studies, "affective engagement is the very means by which literary works are able to reach, reorient, and even reconfigure their readers" (Felski 2015, p. 177). Consequently, a novel or a poem would appear not "as a *flight away from the world*, but as *the moment of a constitutive process*, participating actively in the transformation of the actual world of today into the actual world of tomorrow."2 (…).

In most literature, Nature gets portrayed as a romantic 'other', distinct from the "human", in its varied manifestations, ambivalent, melancholic, pleasant or full of despair. We find this othering quite consistently in literature, be it that of Kalidasa, Wordsworth, Coleridge, Baudelaire, or others. This can impede us from realizing the complex interconnectedness, the dependency relationship, between 'Nature as the other' and 'us' or 'me', and all beings. The othering of Nature makes it difficult to be aware of the interconnectedness and the relationship of dependency between nature, beings and objects; more so because everything in Nature is not pleasant, like anything else in this world. Another issue that Lesnick has mentioned is that, "the complicated potential of literary texts themselves as well as students' identities and ideas, are under-utilized in classrooms as a resource for experience, reflection and critical discussion." This happens due to perceiving literature as a source of exemplars or values "to take advantage of the complexity of students' experiences, belief systems and sense of responsibility as human beings as they intersect with those represented in literary texts" (Lesnick, 2006, p. 30). She has argued that "ethically meaningful interactions occur as part of the ongoing work of reading, writing, and conversing in school" as "literary study brings experiences of language, culture, identity, imagery, metaphor, narrative, beauty, mystery and history into focus and into play as people create relationships with one another through and with texts" (p. 43).

The dominant aspects of pedagogical practices discussed above are dialogic in nature where students are not *told* what a text holds; rather they debate through written and oral dialogues with teachers and other students in the form of open inquiry bringing in complex ethical implications of different "assumptions, beliefs, […] and stories from other sources and using them in constructing responses to present phenomena" (Lesnick, p. 40). Such dialogic pedagogy generates an important bridging for students between the ecological aspects of literary texts and their classroom application to foster sustainability competencies.

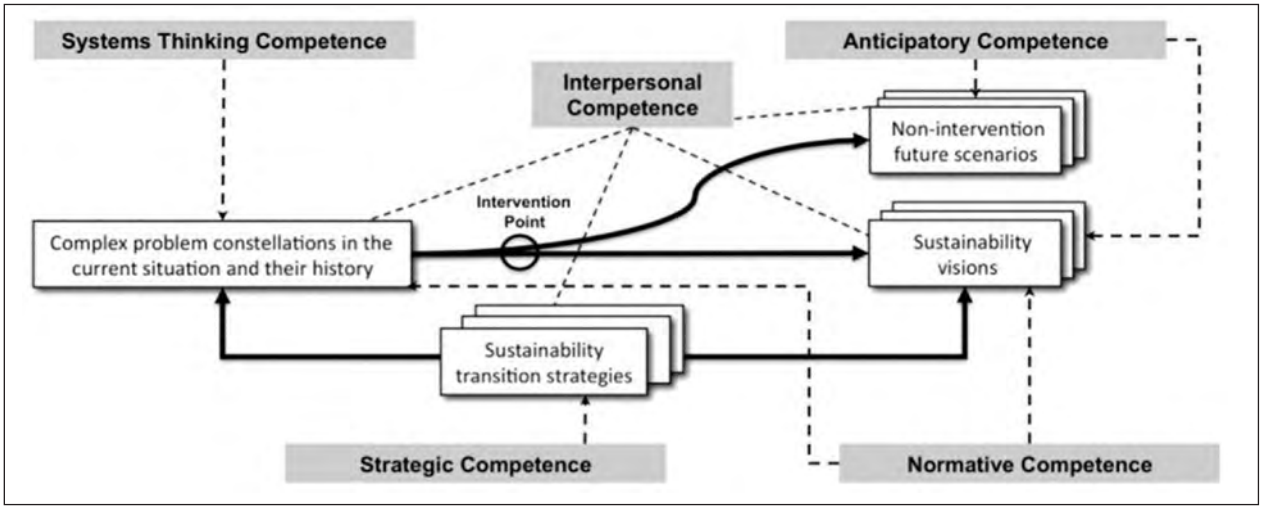
Mapping ESD onto Literary Studies

Five core competencies recognised in sustainability enumerate systems-thinking competency, anticipatory competency, normative competency, strategic competency, and interpersonal competency (Wiek et al. 2011).

Wiek et al. 2011 present these competencies and their function in ESD. This is one of the models UNESCO (2017) has used to prepare ESD learning objectives that includes pluralism, critical thinking, and the scope for diverse viewpoints to develop various competences. ESD thus provides an interpretive platform to students, where they learn to reflect upon their own views on sustainability, respect others' views, and develop the ability to participate in various sustainability groups.

Wiek et al.'s normative competence stands for "the ability to collectively map, specify, apply, reconcile, and negotiate sustainability values,

Figure 1: Flow chart for Foundation for ESD in Literature Courses



Wiek et al. 2011, p. 206

principles, goals, and targets" (2011, p.209). Systems thinking is "the ability to collectively analyze complex systems across different domains […] and across different scales" (p. 207), while interpersonal competence is pivotal to noticing and appraising cognitive pluralism (p. 211). These aspects form the foundation for ESD in literature courses (Fig-1).

Wiek, et al. (2011) have maintained that literary knowledge needs to develop critical thinking, understand text implications through deep analysis, and also the proficiency to "read the world" (p. 208) that relates sustainability in ESD to text reading. *Reading the world* can trigger transitional strategies of performative literacy (Blau 2003, pp. 204-212) connecting literary knowledge of texts to actual action in the outside world. Blau (2003, p. 204-205) discusses how literary competence is relatable to sustainability competence, and transferable to form a part of collective action. For example, a native English reader of *Macbeth* (Shakespeare 1606) is likely to bring in their existent socio-cultural conceptions and prejudices to access the text implications, which a student from a different culture probably does not Duncan's murder and the illegitimate appropriation of the throne unsettles the socio-political order. Macbeth's action throws nature to the brink. The earth trembles, storms rage at impossible levels, insanity grips animals, and they devour each other in a frenzy. A native reader's grasp of these facets will be different from that of students with different referents, cultural norms, and lore. Being aware of such diverse interpretations bear the possibility of understanding nature from other angles, and be proactive about sustainability in different manners that may hold better possibilities for mankind. Inclusive interpersonal literacy holds "the capacity to understand, embrace, and facilitate diversity across cultures, social groups, communities, and individuals" (Wiek et al. 2011, p. 211), key elements for global eco-sensitivity. Also, according to Clark, "Environmental criticism now finds itself having to break down intellectual barriers that in the past gave its own procedures and objects relative separateness" (Clark 2015, p. 197). That is to say, in the present context, literature teaching can no longer be bounded by age-old assumptions about what elements in a text are the so-called *universal*, nor that a text can be rooted in an acknowledged *original* milieu. Constant intellectual inquiry is the essential input to cultivate sustainable citizens of our graduates. Integration of ESD into any literature curriculum must develop the performative literary competence that connects to sustainability.

When literary education affords debates on what other readers understand of a text, it asks questions, such as, why different readers hold different interpretations of the same text, or to what extent the other interpretations are probable. Thus, literary and interpersonal competences can couple with ESD training for sustainability competence. ESD can engender the potential of literature for cultivating students' acceptance of pluralism, uncertainty, and an inclination to accept that no knowledge is final.

These also outline the underpinnings of sustainability and ESD.

Literature–ESD classroom can instil sustainable literary competences for an *after effect* beyond the class, that is, a creating a distinct sense of "carry away" (Rosenblatt 1994, p.25) value, carrying away something ecological from a literary text. Students will use positions to explore the existential issues in a text along with appreciating its aesthetic quality. Such approaches have to be taught, and learned, not to relegate ESD in literary education only to glean sustainability information from texts. The process potentially trains students to perceive elements that would otherwise go unnoticed. Such methods can create overlaps between the competencies of text interpretation and those of sustainability.

A significant pedagogical issue to consider is how a teacher might gauge whether the environmental perspectives analysed in a text are relatable to the external world already known to students? Students reading climate fiction may be more concerned about climate change, but it is unlikely that the message would be transferred to action by the same students to do something to repair climate change. A 'lab training approach' in literature classes with a transformation potential is more likely to produce action using the message from the texts. A method of discussion, confrontation and engagement for the real world can be used through which students can create ideas in the institutional context that they use as a habitual practice outside.

The presuppositions raised here frame a very different theoretical framework that can employ a variety of teaching methods. One possibility of this methodology is conducting regular literature workshops where teachers support students to develop metacognitive awareness of sustainability embedded in texts. This requires 'close reading' processes of critical discourse analysis and other related theories, mingled with discussions with other participants.

Instead of accepting the apparent value of texts, literature teaching can utilise the method of Indian Gurukul pedagogy of aiming for wisdom rather than closing at knowledge, or the western Socratic discussion to unravel implications. Course designers and academics can explore other methods suited to student backgrounds with the perspective of the educational wisdom system of ancient India, which may be put as this:

"Don't offer a person a fish,
Also don't teach them how to fish,
Instead, inspire them to discover their own method of fishing ".

(My variation of the original)

Students striving to raise questions and get their own answers respecting, comparing and contrasting those with other responses is the system to attain wisdom, and not the education to only gain knowledge. One example may be pertinent here. Kierkegaard (1919: English translation), Danish theologist, poet, author, critic, and existentialist philosopher, challenged himself to get the various implications of the Biblical tale of Abraham and Isaac by rewriting the story four times from the perspective of each protagonist. This can be done for eco-reading of texts in literature workshops. The approach is to structure ecological and literary classrooms where students and texts as different entities can influence each other.

Another example to highlight this mutual impact factor is: If students encounter the fact in a poem or story that rising temperature is melting the glaciers, what would their choice be? Should they use air-conditioners to cool themselves or think of ways to reduce the general global temperature? Such questions raise action-oriented environmental awareness.

Camus' *The Plague* (1947) describes how the residents of the Algerian city of Oran battle together the lethal calamity. For ESD, this process of collective action can be discussed as communal harmony, pointing to a large-scale cooperation where individuals fight a disaster, not as separate entities, but being highly dependent on their context, be it Nature or the community.

A such fictional exploration of the interdependence among human beings, other beings, and Nature may enable literature students to become more mindful of the unlimited links that connect us with our surroundings. Students can explore questions, such as: does Camus call attention to the damaging aspects of an individualistic concept of human existence; does he incite the reader to notice the myriad relationships that individuals really have with their surroundings; how does Camus achieve

these objectives; if you think these objectives are not present in *The Plague*, how do you justify your stance? They can work on collaborative projects in local communities to get answers to such questions.

The selection of texts becomes a key feature of an ESD pedagogy to support the sustainability aspects of teaching objectives and learning outcomes. These texts can inculcate literary competence in the students while they ingrain sustainability competence.

Conclusion

This article anchors on the facts that existing university literature courses cannot deliver to the students the right ecological awareness for practical action from their side. Existing texts with ecological values and moral attitudes, and the prevailing pedagogy of critical reading and discussion of the tenets: nature, the beings, inclusiveness, plurality, and sustainability paired with aesthetics in literary texts, are useful focal points for exploration and evaluation. However, a more relevant approach for students is to ask not how literature relates to sustainability, but how the concept of sustainability deepens literary competence through an enriched comprehension and application of sustainability. The theoretical framework projected in the discussion here attempts to instill in literature students a sustainable literary competence.

The discussion also focuses on how issues in ESD can justify or nullify theories and approaches in teaching literature. ESD, in these senses, will not be a mere add-on factor in a literature syllabus just because it has to be there but should be integral to the curriculum to develop a variety of competencies: pluralistic, Anthropocene, symbiocene and ethical along with the literary. By locating the connections between literary competence and sustainability competences, teachers and students can detect further reasons to opt for exploratory, dialogue-based approaches to texts. Kollmuss & Ageyman (2002) state, "the question of what shapes pro-environmental behavior is such a complex one that it cannot be visualized in one single framework or diagram" (p. 248).

Sustainability competence is multi-faceted since it is complex, and it constantly evolves. Our knowledge of ecology and sustainability, and how this ought to affect human actions, therefore, require continual modifications. Literature possesses the potential to help handle the complexities of sustainability, not because literary texts carry prototypes of pro-environmental comportment, but because learning to 'deep-read' literature involves being inclusive of divergent opinions, being able to critically evaluate viewpoints, not taking any option to be the final one and being rational, all together. The suggested literature-ESD pedagogy is not *the* solution against the environmental clock ticking against the earth, yet it may contribute some amount of sand in building the epical bridge, probably the one that has the best chance for our sustainable future. If at all such a curriculum gets its chance in university education, it still will have a long race to prove it efficacy.

This is only the beginning!

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Higher Education for *Atmanirbhar Bharat*: Training for the Future Jobs

Upinder Dhar* and Santosh Dhar**

The prime focus of any progressive country is to nurture and optimize the potential of its human capital to make them future-ready and adaptable. We are the largest market for the entire world besides having the potential to become absolutely atmanirbhar. In a country like India where 50% of its total population is aged below 25 years, the biggest responsibility of a credible education system is to nurture the learners with care.

Active Listeners to Active Learners

The National Education Policy--2020 is a milestone toward creating a self-reliant India. The 21st century has triggered very fast changes in all walks of life, be it economic, social, technological, political, and the like. People are going for innovations using technology and information technology. The universities are offering online education and training, financial transactions are being made online, the government is shifting to e-governance and digitization, automated manufacturing and quality assurance are being implemented in all industries, food is being served at homes and whatnot.

The learning abilities, learning process, learning resources, assessment of learning is decided by learners. Learners are the centre of the learning process. The learners are expected to perform an active and dynamic role in the learning process. They are expected to possess self-motivation for learning and developing the competencies and using them in the world of work situations. Self-motivation takes learners towards owning the learning outcomes, make them accountable to themselves, and empowers them to achieve the learning outcomes. Learners complete the learning process on their own with or without external motivation and support (Gupta & Gupta, 2022).

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Faculty members should come out from traditional and comfortable pedagogical and andragogical approaches and develop their capacity to use e-learning, virtual learning, e-tutorials, MOOCs-based programmes on SWAYAM, and other learning systems accessible through the internet. Faculty should encourage students to introspect, reflect and evaluate their learning process on what and how aspects of learning. They should be facilitated to develop skills for self-determined learning and learner-centered learning. Opportunities should be created for the students to participate in multi-disciplinary activities to develop holistic competence to deal with the situation and prevent problems in the future.

The students should shift from active listeners to active learners in a self-managed learning environment as it is done in completing major projects of undergraduate and postgraduate programmes. Faculty shall have to perform multiple roles such as mentors, coaches, facilitators, confidence builders, resource providers, learning skills developers, and the like. The idea of transforming India through its education system to bring about the desirable change in undoubtedly a daunting task. In fact, need of the time is definite change in totality.

NEP-2020, as a key pillar of *atmanirbhar bharat*, has been envisioned to transform India into a self-sufficient global knowledge economy through a holistic, flexible and multidisciplinary education system that suits its challenging needs. It insists that without basic learning, the rest of the policy becomes irrelevant. In it lies the biggest possibility of the policy's impact on not only education but also on equity and inclusion, the hallmarks of quality education that everyone is on the same page and that everyone knows how to read that page. The best higher education institutions in the world, such as those in the United States and the United Kingdom work as knowledge centres that facilitate social change. In India, universities are conceptualized as development engines for growth in the areas they are set up.

The central universities and central research institutes are already working in the states like Manipur and Mizoram with an aim to provide higher education and facilitate change and development in the under-developed regions. So far, academic institutions have focused mostly on training their students in the skills that are required in larger companies. *Atmanirbhar bharat* has brought the country's focus on MSMEs, one of the key driving forces towards self-sufficiency, as they constitute 80 per cent of the workforce in the Indian industry.

Acting as Mentors

MSME sector drove the rapid growth of economies, such as South Korea, Japan, and Singapore by promoting innovation at the local level. In advanced countries across the world, MSMEs have engaged with academia by investing in research and innovation - a relationship that can benefit both institutions and industry. In line with the vision for the future of work, the demand is for academic institutions to create learning experiences that cover the gamut of disciplines or curricula that fall under an overarching theme; in other words, an integrative - discipline approach. According to, students need to be trained for jobs that do not exist today but will be in demand in the future (Gupta, 2020).

Although more than 12 million Indians enter the workforce every year, not every one of them is adequately equipped for the workplace. A Deloitte survey shows that the relationship between institutions and their alumni is still transactional, and usually confined to the placement season, and revolves around once-a-year passive get-togethers – 52 percent of alumni say they don't connect with their institutions, and those who do, connect via an annual event. Academic institutions need to work harder to connect with their alumni-take a customer-engagement approach that focuses on creating specific opportunities that cater to the needs of all stakeholders – not just to help fresh graduates in their job hunt but also to facilitate networking, learning, and knowledge transfer.

NEP-2020 streamlines the ambit of higher education. Embracing the local languages, creating dedicated spaces to upskill faculty, accommodating multiple entry points in mainstream education, and accommodating a here to fore unimagined budget of 6% of the country's GDP for the National Research Foundation, says it all about the enormous macro vision and the minute microscopic detailing put into the entire policy. Alumni from higher education institutions can act as mentors to new graduates from their alma mater, those who are specialists in their field and leading innovation in their jobs can help universities advance their R&D capabilities, and they can share their knowledge earned in the field with both students and faculty.

As India moves toward self-reliance, it not only needs to build on its industrial strength but also tap the power of industry to build the workforce of tomorrow. It also needs its academic institutions to help the country live up to the idea of self-reliance by creating a workforce that is innovative, aware of the ground realities, and ready to face the future. Combining the two forces could bring about the change in mindset and the expertise required for the nation to achieve *Atmanirbhar Bharta.*

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Transformative Higher Education: Critical to the Success of Self-reliant India

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Indian higher education system has come a long way since the establishment of its first university in 1857. The system has grown in size and complexity, with more than 1000 universities and over 50,000 colleges catering to the diverse educational needs of the country. However, there is a pressing need for transformation to meet the challenges of a rapidly changing world, and to support the vision of a self-reliant India or *Atma Nirbhar Bharat.*

The Indian higher education system has several strengths, including a strong emphasis on academic excellence and research, a large pool of talented students and faculty, and a vast network of educational institutions. However, there are also several challenges that need to be addressed. These include a lack of quality infrastructure and resources, outdated curricula, insufficient funding, inadequate teacher training, and a mismatch between the skills imparted and the demands of the job market. To address these challenges, there needs to be a transformative approach to higher education that focuses on enhancing quality, relevance, and innovation. This can be achieved through several key measures.

The curriculum should be revamped to align with the needs of the job market and to incorporate emerging technologies and interdisciplinary approaches. There should be a greater emphasis on practical training and experiential learning to equip students with the skills needed for the 21st-century workplace. The infrastructure of educational institutions needs to be modernized with state-of-the-art facilities and equipment to provide students with a world-class learning experience. This would include investment in digital infrastructure and the development of online platforms to enable remote learning and increase access to education.

The quality of teaching is crucial to the success of any educational institution, and faculty development programs should be implemented to enhance the skills and knowledge of teachers. This would include training in modern teaching methods, research skills, and pedagogical innovations. Industry-academia collaboration can help bridge the gap between academia and the job market by providing students with hands-on experience and exposure to real-world challenges. Collaboration can take many forms, including internships, research partnerships, and joint training programs.

Transformative Indian higher education is crucial for the realization of the vision of a self-reliant India. By adopting a multi-dimensional approach that focuses on curriculum reforms, infrastructure upgrades, faculty development, and industry-academia collaboration, the Indian higher education system can be transformed to meet the challenges of the 21st century. This would not only benefit individual students and institutions but also contribute to the development of a strong and prosperous nation.

The COVID-19 pandemic has highlighted the importance of digital transformation in education. To ensure the continuity of education during crises and to increase access to education for students in remote areas, there is a need to invest in digital infrastructure and develop online platforms for learning. Digital transformation can also facilitate personalized learning, adaptive assessments, and the use of artificial intelligence to enhance the learning experience. This would require the development of digital literacy among students and teachers and the integration of technology into the curriculum.

Internationalization can enhance the quality of higher education by exposing students and faculty to global best practices, ideas, and cultures. This can be achieved through the recruitment of international faculty and students, the establishment of international partnerships and collaborations, and the incorporation of global perspectives in the curriculum. Internationalization can also enhance the employability of Indian students in the global job market, and contribute to the development of India's soft power and diplomacy.

Interdisciplinary and transdisciplinary education can foster innovation, creativity, and problem-solving skills by breaking down disciplinary silos and

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integrating knowledge from diverse fields. This can be achieved through the development of interdisciplinary and transdisciplinary programs, the establishment of interdisciplinary research centers, and the promotion of interdisciplinary collaborations among faculty and students. Interdisciplinary and transdisciplinary education can also address complex societal challenges by bringing together diverse perspectives and expertise.

Quality assurance and accreditation can ensure the delivery of high-quality education and enhance the credibility of educational institutions. The National Assessment and Accreditation Council (NAAC) has been established to assess and accredit Indian higher education institutions based on various parameters such as teaching-learning, research, infrastructure, governance, and social inclusivity. However, there is a need to strengthen the accreditation process and make it more transparent, accountable, and responsive to the changing needs of the higher education sector.

Inclusive education can ensure access to education for all, regardless of their socio-economic status, gender, caste, religion, or disability. This can be achieved through the provision of scholarships, financial assistance, and other support services for marginalized and disadvantaged students. Inclusive education can also promote social cohesion, reduce inequalities, and contribute to the development of a more equitable and just society.

Entrepreneurship and innovation can enhance the employability of Indian students and contribute to the development of a knowledge-based economy. This can be achieved through the promotion of entrepreneurship education, the establishment of incubation centers and startup ecosystems, and the integration of innovation and design thinking in the curriculum. Entrepreneurship and innovation can also promote social and environmental entrepreneurship, and address the challenges of sustainable development.

Transformative Indian higher education is crucial for the development of a self-reliant, innovative, and inclusive India. By adopting a multi-dimensional approach that focuses on digital transformation, internationalization, interdisciplinary and transdisciplinary education, quality assurance and accreditation, inclusive education, and entrepreneurship and innovation, the Indian higher education system can be transformed to meet the challenges of the 21st century. This would not only benefit individual students and institutions but also contribute to the development of a strong and prosperous nation. However, transformative Indian higher education requires sustained political will, public-private partnerships, and stakeholder engagement to overcome the challenges of implementation and ensure the success of the transformative agenda. Despite the potential benefits of transformative Indian higher education, there are several challenges that need to be addressed in order to achieve the desired outcomes. These challenges include:

Higher education in India suffers from chronic underfunding, with the public expenditure on education as a percentage of GDP being much lower than the global average. This has resulted in inadequate infrastructure, insufficient faculty, and limited access to technology and research facilities. To address this challenge, the government needs to increase public spending on education, encourage private sector investment in education, and develop innovative financing models such as social impact bonds, crowdfunding, and philanthropy.

The quality of higher education in India is heavily dependent on the quality of its faculty. However, there is a shortage of qualified and competent faculty, particularly in emerging fields such as artificial intelligence, data science, and robotics. To address this challenge, the government needs to invest in faculty development programs that focus on enhancing teaching, research, and leadership skills. It also needs to attract and retain talent from India and abroad through attractive compensation packages, career advancement opportunities, and supportive work environments.

The Indian higher education system is often criticized for its rigid, outdated, and exam-oriented curriculum, which fails to prepare students for the demands of the 21st century. To address this challenge, there is a need to undertake a comprehensive curriculum reform that is based on global best practices, interdisciplinary and transdisciplinary approaches, and emerging fields of knowledge. The curriculum should focus on the development of critical thinking, problem-solving, communication, and collaboration skills, and should incorporate experiential learning, internships, and project-based assignments.

The Indian higher education system is often criticized for its low research and innovation output, particularly in comparison to countries such as China and the United States. This is due to a lack of

funding, infrastructure, and incentives for research and innovation. To address this challenge, there is a need to develop a culture of research and innovation in higher education institutions, through the provision of funding, infrastructure, and incentives for faculty and students. There is also a need to promote industry-academia collaborations, startup incubation, and technology transfer to ensure that research outcomes translate into practical applications.

The Indian higher education system is characterized by a complex and fragmented governance and regulatory structure, with multiple agencies and bodies responsible for different aspects of higher education. This has resulted in overlapping and conflicting mandates, a lack of coordination, and inconsistent standards of quality. To address this challenge, there is a need to streamline the governance and regulatory framework, through the establishment of a single regulatory body that is responsible for all aspects of higher education, including accreditation, funding, and quality assurance. The regulatory body should be independent, transparent, and accountable, and should have the mandate to promote excellence and innovation in higher education.

The Indian higher education system is often criticized for its lack of inclusivity with students from marginalized and disadvantaged backgrounds facing significant barriers to access and success. This is due to factors such as caste, gender, religion, and geography. To address this challenge, there is a need to develop a more inclusive and diverse higher education system, through the provision of financial assistance, scholarships, and support services for disadvantaged students, and the promotion of diversity and inclusion in the curriculum, faculty, and student body. There is also a need to address social inequalities and discrimination in society, which are reflected in the higher education system.

Transformative Indian higher education is crucial for the development of a self-reliant, innovative, and inclusive India. However, it faces several challenges that need to be addressed in order to achieve the desired outcomes. These challenges include funding, faculty development, curriculum reform, research and innovation, governance and regulation, and inclusivity and diversity. Addressing these challenges requires a multi-pronged approach that involves government policies, institutional reforms, industry partnerships, and societal changes.

The government needs to prioritize education spending and develop innovative financing models to address the funding challenge. It also needs to invest in faculty development programs, attract and retain talent, and promote interdisciplinary and transdisciplinary approaches to teaching and research. Curriculum reform is necessary to make the Indian higher education system more relevant and responsive to the needs of the 21st century. This requires a comprehensive review of the curriculum, the incorporation of experiential learning, and the development of critical thinking, problem-solving, communication, and collaboration skills.

Research and innovation are essential for India's growth and development, and the government needs to provide funding, infrastructure, and incentives for faculty and students to conduct high-quality research. It also needs to promote industry-academia collaborations, startup incubation, and technology transfer to ensure that research outcomes translate into practical applications.

Governance and regulation need to be streamlined to ensure that the higher education system operates effectively and efficiently. This requires the establishment of a single regulatory body that is independent, transparent, accountable and responsible for all aspects of higher education, including accreditation, funding, and quality assurance.

Inclusivity and diversity are essential for building a more equitable and just society, and the higher education system can play a critical role in promoting these values. The government needs to provide financial assistance, scholarships, and support services for disadvantaged students to address the barriers to access and success. It also needs to promote diversity and inclusion in the curriculum, faculty, and student body and address social inequalities and discrimination in society.

One important aspect of transformative Indian higher education is the need to focus on interdisciplinary and transdisciplinary approaches to teaching and research. Traditional disciplinary boundaries are becoming increasingly blurred, and many of the most pressing challenges facing society today require collaboration across multiple disciplines. For example, addressing climate change requires expertise in science, engineering, policy, economics, and social sciences. Similarly, developing new technologies requires knowledge from multiple fields such as

computer science, materials science, and biology. Thus, it is essential that Indian higher education institutions incorporate interdisciplinary and transdisciplinary approaches into their teaching and research programs.

There are several benefits to adopting interdisciplinary and transdisciplinary approaches in higher education. First, these approaches can lead to innovative solutions to complex problems that would not be possible through a single-discipline approach. By bringing together experts from different fields, interdisciplinary and transdisciplinary approaches can help identify novel solutions that draw on the strengths of each discipline. This can lead to breakthroughs in research and innovation that can have significant societal impacts.

Second, interdisciplinary and transdisciplinary approaches can help prepare students for the demands of the modern workforce. Many employers today are looking for employees who have diverse skill sets and can work effectively in multidisciplinary teams. By incorporating interdisciplinary and transdisciplinary approaches into their teaching programmes, Indian higher education institutions can help prepare students for these demands and improve their employability.

Third, interdisciplinary and transdisciplinary approaches can help promote a culture of collaboration and innovation within higher education institutions. By bringing together faculty and students from different disciplines, these approaches can create opportunities for networking, mentoring, and knowledge sharing. This can help build a more vibrant and dynamic academic community and lead to more impactful research and innovation.

However, incorporating interdisciplinary and transdisciplinary approaches into higher education is not without its challenges. One major challenge is the need for faculty and students to have a strong foundation in their own discipline before branching out into other fields. This requires a robust disciplinary education system that provides students with a solid foundation in their own discipline while also allowing them to explore other fields.

Another challenge is the need for institutional support for interdisciplinary and transdisciplinary approaches. This includes the development of interdisciplinary and transdisciplinary courses and programs, the establishment of interdisciplinary research centers, and the provision of resources and support for faculty and students engaged in interdisciplinary and transdisciplinary research. Institutional support is essential for creating a culture of collaboration and innovation that can lead to impactful research and innovation.

Furthermore, interdisciplinary and transdisciplinary approaches require a shift in mindset from both faculty and students. Faculty need to be willing to collaborate across disciplinary boundaries, and students need to be open to learning from experts in other fields. This requires a cultural shift within higher education institutions that values interdisciplinary and transdisciplinary approaches and recognizes the benefits that they can bring.

Another important aspect of transformative Indian higher education is the need for greater emphasis on entrepreneurship and innovation. India has a vibrant startup ecosystem, and the government has launched several initiatives to promote entrepreneurship and innovation. However, there is still a significant gap between the academic research conducted in higher education institutions and its commercialization.

To bridge this gap, higher education institutions need to foster a culture of entrepreneurship and innovation that encourages faculty and students to translate their research into practical applications. This requires a shift in mindset from both faculty and students, who need to view entrepreneurship and innovation as viable career paths. It also requires the provision of resources and support for startup incubation and technology transfer.

Furthermore, Indian higher education institutions need to establish stronger partnerships with the industry to ensure that their research outcomes translate into practical applications. Industry partnerships can provide funding, mentorship, and access to markets and customers, which can help startups and spinoffs to scale and grow.

Finally, Indian higher education institutions need to focus on building a more diverse and inclusive academic community. This requires addressing the underrepresentation of certain groups in higher education, including women, minorities, and persons from marginalized communities. Achieving greater diversity and inclusion in higher education can have several benefits, including enhancing creativity, promoting innovation, and improving the quality of research and teaching.

To achieve greater diversity and inclusion, Indian higher education institutions need to adopt several strategies. First, they need to adopt proactive measures to recruit and retain students, faculty, and staff from underrepresented groups. This includes establishing scholarship and fellowship programs for students from marginalized communities, providing mentorship and support for faculty and staff from underrepresented groups, and creating a more inclusive and welcoming campus environment.

Second, Indian higher education institutions need to incorporate diverse perspectives into their teaching and research programs. This includes incorporating a range of perspectives from different disciplines, cultures, and backgrounds, and promoting the development of curricula that reflect the diversity of Indian society.

Third, Indian higher education institutions need to create a more inclusive and equitable workplace culture. This includes promoting flexible work arrangements that allow faculty and staff to balance work and family responsibilities, providing equal pay for equal work, and establishing policies and practices that promote work-life balance.

One important aspect of transformative Indian higher education is the need to integrate technology and digital learning into teaching and research programs. The COVID-19 pandemic has highlighted the importance of technology and digital learning in higher education, as many institutions were forced to move their teaching and learning activities online. This has accelerated the adoption of digital technologies and online learning platforms and has opened up new opportunities for Indian higher education institutions to enhance the quality of their teaching and research programs.

Integrating technology and digital learning into higher education has several benefits. First, it can enhance the quality and accessibility of education. Digital technologies and online learning platforms can provide students with access to high-quality educational resources from anywhere in the world. This can be particularly beneficial for students from remote areas or those who cannot afford to attend traditional brick-and-mortar institutions.

Second, integrating technology and digital learning can help to personalize education. Digital technologies can be used to tailor learning experiences to the needs and preferences of individual students. This can lead to more effective learning outcomes and better student engagement.

Third, technology and digital learning can facilitate collaborative learning and research. Online platforms can be used to connect students and faculty from different institutions, allowing them to collaborate on research projects and share knowledge and expertise. This can lead to more impactful research outcomes and a more vibrant and dynamic academic community.

However, integrating technology and digital learning into higher education is not without its challenges. One major challenge is the need for faculty and students to have the necessary skills and infrastructure to effectively use digital technologies. This requires investment in training and support for faculty and students, as well as the development of robust infrastructure to support online learning and research activities.

Another challenge is the need to ensure the quality and validity of online educational resources. This requires careful evaluation and quality assurance processes to ensure that online resources meet the same standards as traditional classroom-based learning activities.

Finally, integrating technology and digital learning into higher education requires a shift in mindset from both faculty and students. Faculty need to be willing to adopt new teaching methods and incorporate digital technologies into their teaching activities. Students need to be open to learning through online platforms and to taking greater responsibility for their own learning.

Another important aspect of transformative Indian higher education is the need to prioritize sustainability and environmental awareness. India is facing a range of environmental challenges, including air pollution, water scarcity, deforestation, and climate change. Higher education institutions can play a crucial role in addressing these challenges by incorporating sustainability and environmental awareness into their teaching and research programs.

There are several ways in which Indian higher education institutions can prioritize sustainability and environmental awareness. First, they can incorporate sustainability and environmental awareness into their curricula across disciplines. This includes providing students with a foundational understanding

of sustainability and environmental issues and incorporating sustainability principles into course content and assignments.

Second, Indian higher education institutions can promote research and innovation that addresses environmental challenges. This includes research in areas such as renewable energy, sustainable agriculture, and environmental policy.

Third, Indian higher education institutions can model sustainable practices in their own operations. This includes adopting sustainable building practices, reducing energy and water consumption, and promoting waste reduction and recycling.

In addition, Indian higher education institutions can play a key role in promoting community engagement and social responsibility. This includes encouraging faculty and students to engage with local communities and address social and environmental issues through research, education, and community service.

Finally, Indian higher education institutions need to foster a culture of lifelong learning and professional development. This includes providing opportunities for students and faculty to engage in continuous learning and professional development activities throughout their careers. This can help to promote innovation and creativity, enhance employability, and improve the quality of research and teaching.

However, achieving transformative Indian higher education requires a concerted effort from all stakeholders. This includes the government, higher education institutions, faculty, students, industry, and civil society. The government needs to provide the necessary support and funding to enable higher education institutions to implement transformative educational reforms. This includes investment in infrastructure, research and development, and faculty and student training and support.

Higher education institutions need to be proactive in adopting transformative educational practices and promoting interdisciplinary and transdisciplinary approaches. They need to invest in digital infrastructure and technology-enabled learning platforms and ensure that faculty and students have the necessary skills to effectively use these tools. They also need to prioritize sustainability and environmental awareness and promote community engagement and social responsibility.

Faculty and students need to be open to new teaching and learning approaches and be willing to adopt digital technologies and interdisciplinary and transdisciplinary approaches. They also need to be committed to sustainability and environmental awareness and engage with local communities to address social and environmental issues.

Industry and civil society also have an important role to play in supporting transformative Indian higher education. Industry can provide funding and support for research and development, as well as opportunities for students to gain practical experience and apply their knowledge in real-world settings. Civil society can provide support and advocacy for transformative educational reforms and help to bridge the gap between higher education institutions and local communities.

Transformative Indian higher education is essential for realizing the vision of *Atma Nirbhar Bharat.* By prioritizing interdisciplinary and transdisciplinary approaches, entrepreneurship and innovation, diversity and inclusion, technology and digital learning, sustainability and environmental awareness, community engagement and social responsibility, and lifelong learning and professional development, Indian higher education institutions can play a key role in shaping the future of India. However, achieving transformative Indian higher education requires a concerted effort from all stakeholders, and a commitment to innovation, collaboration, and social responsibility.

Achieving transformative Indian higher education requires a concerted effort from all stakeholders. The government needs to provide the necessary support and funding to enable higher education institutions to implement transformative educational reforms. Higher education institutions need to be proactive in adopting transformative educational practices and promoting interdisciplinary and transdisciplinary approaches. Faculty and students need to be open to new teaching and learning approaches and be committed to sustainability and environmental awareness. Industry and civil society also have an important role to play in supporting transformative Indian higher education.

Transformative Indian higher education is not only essential for realizing the vision of *Atma Nirbhar Bharat* but is also critical for India's sustainable development and growth. By equipping students with the necessary knowledge, skills, and attitudes to navigate a rapidly changing world, higher education

institutions can prepare future leaders and innovators who can help address complex societal challenges.

In addition, transformative Indian higher education can also contribute to India's economic growth and competitiveness by fostering entrepreneurship and innovation, providing industry-relevant skills and knowledge, and promoting research and development. By building strong links between higher education institutions, industry, and local communities, transformative Indian higher education can also help to address pressing social and environmental challenges and contribute to India's sustainable development.

Overall, achieving transformative Indian higher education requires a paradigm shift in how we approach teaching and learning, research and development, and community engagement. It requires a commitment to innovation, collaboration, and social responsibility, as well as a recognition of the importance of interdisciplinary and transdisciplinary approaches, digital learning and technology-enabled education, diversity and inclusion, sustainability and environmental awareness, and lifelong learning and professional development.

Through transformative Indian higher education, India can not only realize the vision of *Atma Nirbhar Bharat* but also contribute to global sustainable development and prosperity. By equipping future leaders and innovators with the necessary knowledge, skills, and attitudes to navigate a rapidly changing world, higher education institutions can help to create a brighter and more prosperous future for all.

In order to achieve transformative Indian higher education, it is important to address some of the challenges and obstacles that may hinder progress. One major challenge is the lack of funding and resources for higher education institutions. The government needs to provide adequate funding and support to enable higher education institutions to implement transformative educational reforms. This includes investment in infrastructure, research and development, and faculty and student training and support. In addition, the government can also promote public-private partnerships and encourage industry support for higher education institutions.

Another challenge is the lack of faculty and student diversity and inclusion. Higher education institutions need to prioritize diversity and inclusion in order to promote a more inclusive and equitable learning environment. This can include recruiting faculty and students from diverse backgrounds, promoting cultural awareness and sensitivity, and providing support and resources for underrepresented groups.

In addition, there is a need for greater collaboration between higher education institutions, industry, and local communities. This can help to bridge the gap between academic theory and real-world practice and provide students with opportunities for practical experience and skill development. Higher education institutions can also engage with local communities to address pressing social and environmental challenges and promote sustainable development.

Moreover, the lack of awareness and understanding of the importance of interdisciplinary and transdisciplinary approaches is another obstacle that needs to be addressed. Higher education institutions need to promote a more holistic and integrated approach to teaching and learning, research and development, and community engagement. This can help to address complex societal challenges and provide students with a more comprehensive understanding of the world around them.

Another challenge is the lack of emphasis on sustainability and environmental awareness in higher education. Higher education institutions need to prioritize sustainability and environmental awareness in order to prepare students for a world that is facing pressing environmental challenges. This can include incorporating sustainability and environmental education into the curriculum, promoting green campus initiatives, and engaging with local communities to address environmental issues.

Lastly, there is a need to promote lifelong learning and professional development among faculty and students. Higher education institutions can provide opportunities for faculty and students to engage in continuous learning and skill development, and to stay up-to-date with the latest trends and developments in their field. This can help to promote innovation and creativity and ensure that graduates are equipped with the necessary skills and knowledge to navigate a rapidly changing world.

Overall, transformative Indian higher education requires a concerted effort from all stakeholders. This includes the government, higher education institutions, faculty, students, industry, and civil

society. By addressing the challenges and obstacles that may hinder progress, and by promoting innovation, collaboration, and social responsibility, Indian higher education institutions can play a key role in shaping the future of India and contributing to global sustainable development.

To further elaborate on the importance of transformative Indian higher education, it is important to discuss its potential impact on various sectors and aspects of society.

One area where transformative Indian higher education can have a significant impact is on the economy. By promoting entrepreneurship, innovation, and interdisciplinary collaboration, higher education institutions can foster a culture of innovation and creativity, which can lead to the development of new industries, products, and services. This can help to create new job opportunities, drive economic growth, and contribute to the development of a knowledge-based economy.

In addition, transformative Indian higher education can also have a positive impact on the healthcare sector. By prioritizing interdisciplinary approaches, higher education institutions can help to address pressing health challenges such as infectious diseases, non-communicable diseases, and mental health. Through research and development, education and training, and community engagement, higher education institutions can contribute to the development of innovative solutions and best practices in healthcare.

Transformative Indian higher education can also play a key role in promoting social equity and inclusion. By prioritizing diversity and inclusion, higher education institutions can help to address systemic inequalities and provide opportunities for underrepresented groups. This can help to promote social mobility, reduce poverty, and promote social cohesion.

Moreover, transformative Indian higher education can also have a positive impact on the environment and promote sustainable development. By prioritizing sustainability and environmental awareness, higher education institutions can prepare students to address pressing environmental challenges such as climate change, resource depletion, and biodiversity loss. Through research and development, education and training, and community engagement, higher education institutions can contribute to the development of sustainable solutions and promote environmentally responsible behavior.

Furthermore, transformative Indian higher education can also have a positive impact on governance and democracy. By promoting critical thinking, civic engagement, and ethical leadership, higher education institutions can contribute to the development of a responsible and informed citizenry. This can help to promote good governance, transparency, and accountability, and contribute to the development of a vibrant and robust democracy.

Overall, transformative Indian higher education has the potential to have a significant impact on various sectors and aspects of society. By promoting innovation, interdisciplinary collaboration, diversity and inclusion, sustainability and environmental awareness, and lifelong learning and professional development, Indian higher education institutions can contribute to the development of a knowledge-based economy, promote social equity and inclusion, address pressing environmental challenges, and promote good governance and democracy. However, achieving transformative Indian higher education requires a concerted effort from all stakeholders, and a commitment to innovation, collaboration, and social responsibility.

Transformative Indian higher education is essential for realizing the vision of *Atma Nirbhar Bharat* and promoting sustainable development and growth in India. By prioritizing interdisciplinary and transdisciplinary approaches, entrepreneurship and innovation, diversity and inclusion, technology and digital learning, sustainability and environmental awareness, community engagement and social responsibility, and lifelong learning and professional development, Indian higher education institutions can prepare future leaders and innovators who can help address complex societal challenges. Through transformative Indian higher education, India can not only realize the vision of *Atma Nirbhar Bharat* but also contribute to global sustainable development and prosperity.

Transformative Indian higher education is essential for realizing the vision of *Atma Nirbhar Bharat* and promoting sustainable development and growth in India. By prioritizing interdisciplinary and transdisciplinary approaches, entrepreneurship and innovation, diversity and inclusion, technology and digital learning, sustainability and environmental

awareness, community engagement and social responsibility, and lifelong learning and professional development, Indian higher education institutions can prepare future leaders and innovators who can help address complex societal challenges. However, achieving transformative Indian higher education requires a concerted effort from all stakeholders, and a commitment to innovation, collaboration, and social responsibility. Through transformative Indian higher education, India can not only realize the vision of *Atma Nirbhar Bharat* but also contribute to global sustainable development and prosperity.

In conclusion, the vision of *Atma Nirbhar Bharat* requires a transformative Indian higher education system that prioritizes innovation, collaboration, and social responsibility. This requires a shift from traditional disciplinary silos to interdisciplinary and transdisciplinary approaches, a focus on entrepreneurship and innovation, a commitment to diversity and inclusion, a transition to digital learning and technology-enabled education, a focus on sustainability and environmental awareness, a commitment to community engagement and social responsibility, and a recognition of the importance of lifelong learning and professional development.

Transformative Indian higher education is essential to the success of *Atma Nirbhar Bharat.* By prioritizing interdisciplinary and transdisciplinary approaches, entrepreneurship and innovation, diversity and inclusion, technology and digital learning, sustainability and environmental awareness, community engagement and social responsibility, and lifelong learning and professional development, Indian higher education institutions can play a key role in shaping the future of India.

Transformative Indian higher education is critical to the success of *Atma Nirbhar Bharat*. By focusing on interdisciplinary and transdisciplinary approaches, entrepreneurship and innovation, and diversity and inclusion, Indian higher education institutions can help prepare students for the demands of the modern workforce, drive innovation and economic growth, and promote social and economic development. Achieving these goals will require a sustained effort by the Government, higher education institutions, and the wider community to invest in higher education, promote innovation and entrepreneurship, and create a more inclusive and equitable society.

Transformative Indian higher education is a key driver for achieving the goals of a self-reliant India (*Atma Nirbhar Bharat*). It can help develop a workforce that is skilled, innovative, and adaptable to changing market demands, promote research and innovation, and build a more equitable and just society. However, to achieve these outcomes, the Indian higher education system needs to address the challenges of funding, faculty development, curriculum reform, research and innovation, governance and regulation, and inclusivity and diversity through a multi-pronged approach that involves government policies, institutional reforms, industry partnerships, and societal changes.

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Future of Learning and Adaptative Approaches for Higher Education Institutions

Atul Khosla*, Rahul Chandel and Shyam Singh Chandel*****

The Sustainable Development Goals (SDGs) were adopted by the UN General Assembly on September 25th, 2015, under the 2030 Agenda for Sustainable Development. The SDGs were formulated to align the world to act towards achieving better quality of life, sustainable growth and to mitigate the effect of climate change. Higher Education Institutions (HEIs) are expected instrumental in achieving the SDG targets as they provide education and can also act as sustainable development model townships for current and future generations. In this study we present an overview of the actions taken by a number of HEIs in achieving SDGs as well as present two models SAREA and iSDG which can be followed by HEIs for a systematic approach. towards global sustainable development. The implementation of SAREA model by Shoolini University is outlined to develop a sustainable HEI campus as a case study.

The Sustainable Development Goals (SDGs) [1] were adopted by the UN General Assembly on September 25th, 2015, under the 2030 Agenda for Sustainable Development [2]. Global warming and climate change concerns are the topical issues in present times. Although coordinated efforts to reduce greenhouse gas emissions have been made since the Kyoto Protocol [3] was signed in 1997 and by Paris Agreement [4] in 2015, the progress made so far is not enough to limit the global temperature above the preindustrial levels to 2°C and preferably under 1.5°C in the current century to prevent major global adverse impact on life. Global emissions rose by around 30% from 1990 to 2010 [5] and have been rising at an average rate of 1.4% per year from 2010 till 2019 with a record high of 59.1 $GtCO_2e$ in 2019 [6] which shows that the emissions continue to rise in spite of global efforts to counter the same. The emissions have to be 32 $GtCO_2e$ lower than the nationally determined contributions by 2030 in order to achieve less than the 1.5°C temperature rise target [6]. In addition to the efforts being made by governments and industries to control emissions, efforts at organizational and individual levels are also required to ensure the success of the United Nations Sustainable Development Goals (SDGs). This can be achieved if awareness about SDGs is activated in the minds of the upcoming generations and the common public also. The latter task is the responsibility of Higher Education Institutions (HEIs) worldwide. HEIs are model townships that can inspire students, local communities as well as public at large to employ sustainable practices and embed climate change awareness in day-to-day life. Hence, HEIs should prioritize and focus their academic curriculum on SDGs and sustainable energy technologies.

Brief Overview of Work Done by Some HEIs for Sustainable Development

A number of HEIs have taken initiative to implement SDGs worldwide. In this section, we present a brief overview of work carried out in some institutions. Western Sydney University, Arizona State University, USA, are some of the leading universities actively working in the realization of SDGs through research, course curriculum, projects and also keeping track of contributions to each SDGs. These universities were globally ranked 1st and 2nd respectively by Times Higher Education (THE) Impact Rankings in 2022 for an overall contribution towards SDGs [7]. Shoolini University has already initiated the implementation of SDGs by establishing a Centre of Excellence in Energy Science & Technology (CEEST) for coordinating activities on sustainability in education, research, innovation, policy, and technology Interventions. Based on the work carried out, Shoolini University was ranked 2nd in SDG-7(Energy for All) [8] and 6th in SDG-6 (Water and Sanitation) globally in THE Impact Rankings 2022 [9] due to various initiatives taken for their implementation in the campus.

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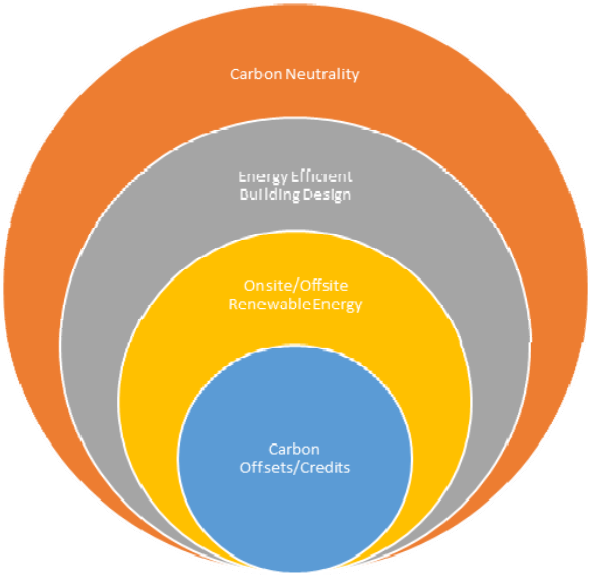
UNICINOS, one of the top three universities in Brazil is the first university in Latin America to receive ISO14001 certification for its environmental management on campus. The university also supports environmental projects for communities residing in the region. In addition to the graduate and undergraduate programs on Architecture and Urbanism, the university offers nine undergraduate programs that are linked to research toward sustainable development. The university has also promoted the São Leopoldo Science Park – Tecnosinos, which hosts various renewable energy and environmental science companies and conducts awareness programs regarding sustainable development. The University of Toronto completed a project under the World Bank's 'Renewable Energy for Rural Access Programme' in 2017-18 that provided reliable, sustainable electricity using solar modules to Mongolia's 140,000 nomadic households. In Japan, the Renewable Energy University League of Japan has been formulated in June 2021 that aims to create a group of universities that will implement 100% renewable energy usage by 2030. All these cases prove that the world is shifting attention toward implementing SDG and HEIs have a significant role to play. Thus, in India, the progress towards SDG fulfillment requires to be accelerated.

Strategy to Achieve SDG Targets by HEIs

The SDGs can be achieved by the HEIs effectively if they form a dedicated Centre for policy planning, coordination, and enforcement of all actions related to SDGs effectively in the HEI. Hence this would be the first action. Next, the dedicated department should formulate an energy and environment policy that is linked with each of the SDGs, their sub-targets, and indicators. The progress of actions towards meeting the policy objectives should be monitored and governed within the HEI every year. To achieve SDG-13, for example, a strategy shown in figure-1 can be used by the HEIs. The first step is to implement energy-efficient architecture like the use of passive solar technology, to lower the conventional energy consumption of buildings. Second is the use of renewable energy through photovoltaic power plants, solar thermal power plants or cooking systems, biogas plants, wind turbines, etc. Third is the purchase of carbon credits to offset any remaining energy requirement.

Figure 1: Main Activities for Achieving Carbon Neutrality



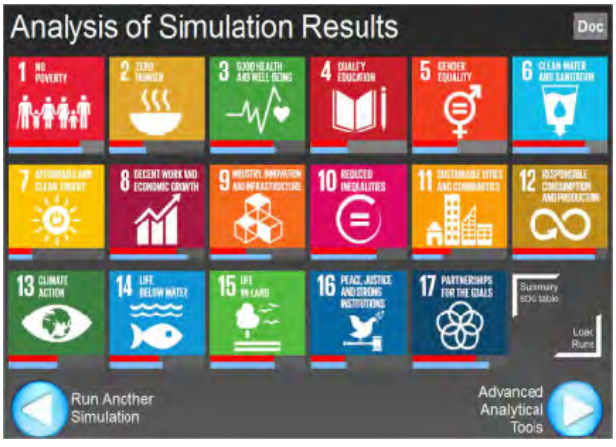
Integrated Sustainable Development Goal (iSDG) Model

The iSDG model has been developed by the Millennium, Washington DC, USA as a software tool to help the policy makers for implementation of the SDGs by use of simulations to evaluate various scenarios. The iSDG model is based on the Threshold 21 integrated national planning model that has been used in over 40 countries Worldwide [10]. iSDG encompasses 30 interlinked model sectors based on three primary dimensions of sustainability: society, economy, and environment (figure 2). iSDG model is

Figure 2: Macro Structure of the iSDG Model Developed by the Millenium Institute, USA [3]

a learning support system to aid evidence-based policy design. The iSDG user interface shows the 17 SDGs and two indicator bars. The red bar (figure 3) is the progress of the SDG in a business-as-usual scenario i.e. if no significant policy interventions are made. The blue bar shows the progress with the specified policy interventions that are entered by the user. For each SDG respective policy interventions can be specified and simulated to check the outcomes in terms of goal fulfillment.

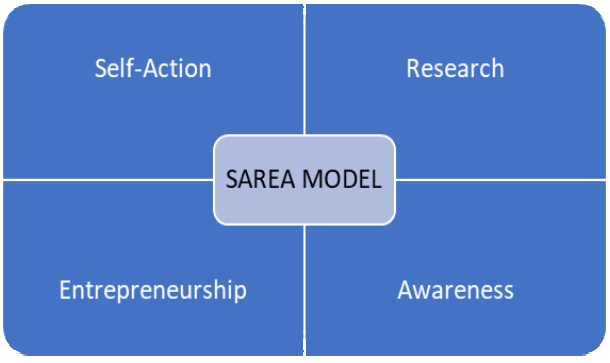
Figure 3: iSDG Software User Interface with Results for Each SDG Simulation



The SAREA -SDG Model

In most simple way, the implementation of any SDG effectively by HEIs can be done using the Self-Action Research Entrepreneurship and Awareness (SAREA) model conceived and implemented by the Centre of Excellence in Energy Science and Technology (CEEST), w.e.f 2019 for taking Shoolini University towards a Net Zero Energy and Carbon Neutral sustainable campus by 2030. Self-Action implies activities implemented within the HEI as identified under various SDGs, along with sustainable practices being followed traditionally in India Research implies conducting research and development in the areas relevant to the respective SDG, Entrepreneurship implies promoting entrepreneurs, startups that focus on sustainable technologies and goals, Awareness encompasses all the awareness campaigns and activities conducted by the HEI to promote sustainability at local, national and international level. The four pillars of the SAREA model (figure 4) are crucial for meeting the overall objective of effective SDG implementation by the HEIs.

Figur4: The SAREA Model for Effective Implementation of SDGs by the HEIs



Implementation of SAREA-SDG Model by Shoolini University

The implementation of the SDGs at the Shoolini University is based on the SAREA Model by CEEST, Shoolini University. CEEST coordinates, implements, and monitors the sustainability-related policies, issues, and the progress of the SDG implementation in the University under the facets of SAREA Model as follows:

Self-Action

Under the Self-Action facet, the energy and environment policies were formulated in 2019 and various interventions were made to enforce the same. The major aspects of the policy are given in Table-1. Under the facet, the university has been successful in demonstrating SDG compliance and sustainable operations resulting in being ranked 2nd globally [8] in SDG-7 and 6th in SDG-6 [9] by Times Higher Education Impact Rankings 2022.

Research

Under the Research facet, the university has already achieved a high ranking with Centre of Excellence in Energy Science and Technology achieving rank 12 in India as per the SCIMAGO Institutional Rankings 2021 due to high-quality energy research. Specific to the SDGs the FWCI of the university was 3.78 for SDG-13 and 3.27 for SDG-7 in 2021 highlighting excellence in SDG-related research [11].

Entrepreneurship

Under this facet, the university has established the MSME Shoolini Innovative Technology Business Incubator to facilitate sustainable and emerging technology startups and to provide funding

Table 1: Policy Interventions at Shoolini University for Energy Conservation and Environment Protection Measures under SDG-7, 11, 13

Policy Interventions
• Installation of 400 kWp solar PV on grid-connected power generation system to meet the partial Energy needs of Shoolini University. Installation of solar water heating systems in the university premises for all hostels.
• Installation of Concentrated Solar Technology based rooftop Solar Steam Cooking system for 500 students for saving energy saving & provide hygienic food
• Reducing electricity bills through the installation of Solar Street lights on the university campus
• Installation of Biogas plant from cow dung, bio residues, and food /kitchen waste generated on the campus. The focus will be given to the implementation of power generation from Biogas, Biomass Gasification, Pyrolysis, and Fuel Cell/hydrogen energy on the campus.
• Installation of all energy-efficient electrical or electronic devices/equipment to save energy on the campus.
• Measures to reduce vehicular pollution on the campus. Restriction of heavy vehicles inside the campus during day time. For night movement of heavy vehicles necessary permission is required from the competent authority.
• Promotion of shared Cab/Taxi and personal cars during office hours. Encourages to use public transport.
• Promotion of electric vehicles/Cart on the university campus or not allowed to buy 1200 CC above car for official uses. The incentive to employees to buy electric cars.
• Initiations of regular tree plantation in the campus and surrounding area for CO_2 emission reduction.
• Initiated the use of bamboo-based and regular waste collection dustbins on the university campus.
• Implementation of waste recycling and sewage treatment plant.

assistance to entrepreneurs. Various proposals are evaluated every year for incubation under the general schemes of the MSME as well as through special programmes like MSME-Hackathon. The university has adopted the National Innovation and Start-up Policy (NISP) for students and faculty of all Higher Education Institutions (HEIs) -2019 and formulated its own policy to facilitate its implementation. The University has already encouraged a number of start-ups with financial assistance. An IPR cell has been established to fill various IPRs including patents by Students, Faculty and Entrepreneurs.

Awareness

The fourth facet of SAREA is Awareness. After the HEI demonstrates by action and consolidates itself in the area of sustainable goals, the next stage is to disseminate knowledge and awareness in the local, national, and international levels. To achieve the latter, the university conducts regular campaigns, conferences, and webinars, to spread the sustainability related knowledge and inspire others to follow the same.

Conclusion

This study presents a SAREA-SDG implementation model for developing a Net Zero Energy, Carbon Neutral and Sustainable Higher Education Institution-Campus by 2030. The sustainability, moving towards Net Zero energy and Carbon neutral HEI campuses addressing the climate change issues and realization of UN SDGs for a sustainable future are the most significant issues, to be addressed globally by HEIs, governments, industries, and the general public. HEIs have a crucial role as they act as sustainable model townships and nurture young minds along with people living around to ignite sustainable thought processes through their actions and awareness campaigns. This goal can be achieved by following the simple SAREA SDG model of CEEST, Shoolini University which stresses Self-Action, Research, Entrepreneurship and Awareness facets and also by the use of software tools like the iSDG. The Indian HEIs need to accelerate contribution and alignment towards SDG realization to compete globally as well as to have a positive impact in their respective regions through

(contd. on pg. 66)

Structuring Philosophy of Education in Indian Context for Foundation of *Atmanirbhar Bharat*

Dibyendu Bhattacharyya*

Structuring the Philosophy of Education is an essential attempt to go through the context and perspectives of synthesizing the philosophy of Education in a logical way with its proper direction for realizing *Atmanirbhar Bharat Mission*. The paper highlights the philosophy of education in the Indian context for restructuring and transforming the present Higher Education in India. The movement of education without its structuring leads nowhere. Contextually it is an effort to expose philosophical perspectives of education as an essential source for transformative higher education.

The philosophic endeavor was initiated primarily in the Indian context to promote quality of life, which came from metaphysical questions to the ultimate target of human beings for attaining perfection and in some cases continual progress towards perfection within the limits of present life where epistemology makes a bridge between the two. We can consider philosophy as a constant source of knowledge aiming at solving problems with its specific methodology for global standard higher education. Swami Vivekananda rightly observed that our education system should be integrated with man-making which may be the source of illuminating Indian Higher Education towards *Atmanirbhar Bharat*.

Why *Atmanirbhar Bharat*?

1. Education without epistemological perspective means expansion of theoretical knowledge only but *Atmanirbhar Bharat* seeks to explore knowledge to develop our potentiality blended with creative and applied knowledge for making it global.
2. Knowledge based on "Manifestation of perfection already in man"
3. Knowledge based on 3H that is by means of Head, Hand and Heart will be meaningful and effective.
4. Knowledge for expansion of Quality.
4. To explore indigenous knowledge for global standards.

Philosophical Perspective for Transforming Indian Higher Education

Indian higher education system has now been isolated from the main streaming global higher education standard requires professionalization and commitment for making it pragmatic. Some of the basic points for transformative higher education are cited below:

Philosophical and Multicultural Perspectives

Philosophical and Multicultural Perspectives of education signify not only classroom activities, but it is also interrelated with the holistic development of a multi-cultural society in the broadest sense education involves essentially two things:

i) Cultural heritage including social and cultural transformation.

ii) Providing the skills, abilities, and understanding in a changing higher education scenario for its transformation.

Comprehensive and Holistic Education

For transformative higher education, it must be associated with the fullest development of learners starting from indigenous knowledge and ending with exploring its inner potentiality in terms of research, innovation, and whatnot to make it a reality by applying mission, vision, and self-perception in Indian Perspectives.

Philosophical Identity

Indian Philosophy based on self-development and self-perception provides an identity that will be helpful for self-understanding. *Atmanirbhar Bharat* will be based on Indian Philosophical Identity, and it will be applied to understanding its social resources to make it happen properly as stated in NEP–2020.

Outcome Based Education

Outcome stands for appreciable National Development by means of the Indian Higher

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Education System. No Education is meaningful unless it is knocking creativity and self-expressive human capacity. Now higher education attempts for changing its vision to transformative higher Education in the light of Indianisation.

How *Atmanirbhar Bharat* Having its Reality in Terms of Philosophical Foundation?

The most important concept of *Atmanirbhar Bharat* is "आत्म नो मोक्षार्थं जगद्धिताय च" that is by applying the self-potentiality ensure highest National Development leading to the upgradation of common people and their society. Human values have been the central concern in education reflected through the following points for a new beginning in transformative higher education:

1. The education system of our country is neither self-supportive nor productive. Actually, we are not in a good position to contribute enough for National Development as well as to provide global standard education. Therefore, we have to ensure quality education by means of transformative educational culture.
2. The envisioned philosophy of education must squeeze problems and their solutions related to the economic, health, values very critically.
3. To promote competitive education system measures are to be taken for ensuring quality education. A professional approach is must for making education effective.

Transforming Higher Education towards a New Vision

Education is basically considered an index of the national developmental process where some basic urges revel the following:

1) Potentiality within the individual is the key sources for developing education in a very natural condition according to the Indian schools of philosophy. In Indian context education is not instrumental rather is a gateway to promoting oneself to a higher order of life.
2) In the Indian aspect education is a constant source for exercising Philosophical truths. There are no basic differences between philosophy and education as philosophy is being practised through educational means and the target for both concerns is the highest development of humanity.
3) Values are rooted in Indian philosophy by the attainment of the quality of self where education is one of the tools for acquiring the essential requirements and that is the uniqueness of Indian philosophy amalgamated with education and life too.
4) Another characteristic of Indian philosophy is equality which is a commitment to the equality of all. It is essentially an ethical quality far more real and profound in the social context.
5) "Enlightenment of inner senses" is the highest priority given in Indian philosophy. Humanity is not here externally exposed but will have to develop through internalization of knowledge.

Structuring the Indian philosophy of education, therefore, does matter the resultant philosophy in the Indian context has been associated with our cultural heritage and value systems reflected through the significant contributions of Indian Educationists where classical Indian philosophical truths and ideas are being applied for inclusion of new knowledge and wisdom in educational systems and practices.

Table-1 presents the basic foundations of Indian philosophy which can lead to proper transformation of the existing system of Higher Education.

Table-1 Philosophical Bases for Transforming Higher Education

Existing Higher Education	**Transformative Higher Education**
Fragmentary	Multidisciplinary
Informative	Knowledge-Base
Root Memorisation	Exploratory
Objective Based	Outcome Based
Servicing Approach	Professional Preparation
Subsidized Sector	Cost benefit and Cost-Effective approach.
Education for quality	Quality education targeting Investment
Traditional	TRANSFORMATIVE

Conclusion

For creating *Atmanirbhar Bharat*, we have to remove the existing deficiencies to promote the system having quality and outcome-based merging together for National Development. We have the potentiality but we have to remove the existing deficiencies for *Atmanirbhar Bharat* and Transformative India in the light of Philosophical perspectives.

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blended learning research and sustainable actions on energy conservation and climate protection.

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Building a Resilient Higher Education System for Accelerated, Inclusive, and Sustainable Growth: The Role of Research and Excellence

Najma Akhtar*

India has been focusing on research and development across a wide range of sectors with the goals of accelerating economic growth and establishing a knowledge-based economy. The government of India has started a variety of programmes in an effort to improve the standard of research and academic achievement in the country. This paper examines the role of innovative initiatives and the challenges they bring to the country's efforts to improve research and academic standing in India. It also discusses the enablers and barriers that India has on its path to becoming a research powerhouse, through NEP 2020. India must determine what is causing the decline in the quality of higher education research for providing inclusive and sustainable solutions. The country, moving in the right direction towards creating and pursuing fresh academic standards, is at the cutting edge of research and innovation activities with electrifying developments.

The Context of Research and Excellence for Nation Building

Research and academic achievements at universities are essential components of a healthy academic environment, which drives innovation and economic expansion across a wide variety of industries (National Science Board, 2020). It is essential to strive for excellence in research in order to broaden one's knowledge base, foster the development of innovative technologies, and tackle complex problems facing society (National Academies of Sciences, Engineering, and Medicine, 2018). Research is conducted in universities in order to come up with novel concepts, hypotheses, and approaches that can influence policy and practice while also helping the growth of new businesses, products, and services (Laudel & Glaser, 2020).

For instance, in the field of medicine, research has resulted in the finding of new treatments and cures for diseases, such as the development of COVID-19 vaccines (Brouwer et al., 2021). The efforts of medical researchers have also contributed to a better understanding of the underlying causes of diseases and the identification of novel targets for the development of therapeutics (Gibney, 2020). In addition, research into renewable sources of energy has led to the development of innovative technologies, such as solar cells and wind turbines, which have the potential to reduce our reliance on fossil fuels and help mitigate the effects of climate change (European Commission, 2021). Through the conduct of research, educational institutions have the potential to both aid society in addressing the most pressing issues of our day and build a better future for everyone.

In addition, universities need to be exceptional if they are to live up to the high standards that have been set for them in terms of education, research, and scholarship (Altbach, 2019). Universities that have a focus on quality attract the brightest students and faculty members who are eager to study and contribute to the academic community. These students and faculty members are attracted to the universities because of the emphasis on quality (Marginson, 2019). With their research and teaching, these experts generate innovative ideas and push the boundaries of knowledge, which contributes to the university's status as a top-tier educational establishment in the global community (Leisyte & Dee, 2021). In addition to this, educational institutions that place a premium on quality have a better chance of securing financial support and cultivating partnerships with private companies and the public sector, all of which can contribute to the advancement of their research and instructional initiatives (Etzkowitz, et. al., 2021). This, in turn, helps universities maintain their leading positions in the respective professions they serve and contributes to the advancement of society. The government of India has started a variety of programmes in an effort to improve the standard of research and academic achievement in the country (Government of India, 2021).

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The Case of India: A Historical Perspective

For many years, India has worked to improve its research and innovation ecosystem. The Indian government has implemented a number of policies and programmes to encourage research and excellence in Indian colleges (Gupta et al., 2019). The formation of the Department of Science and Technology (DST) in 1971 was one of the major initiatives. DST has supported research and development efforts in the country through different financing programmes, including the Science and Engineering Research Board (SERB) and the Technology Development Board (TDB). Furthermore, the DST has established Centers of Excellence (CoEs) in several universities to provide infrastructure and resources for national-level research and development.

The formation of the University Grants Commission (UGC) in 1956 was another significant milestone. The Commission is in charge of promoting and coordinating university education in India. It has implemented numerous programmes to encourage research activities in Indian universities, including as the Basic Scientific Research (BSR) programme, which gives financial aid to institutions for fundamental science research. To foster excellence in research and development, the UGC also promotes the building of research centers in universities through its Special Assistance Program (SAP).

Some Indian universities have also launched programmes to encourage research and innovation. The Indian Institute of Technology (IIT) system, for example, is well renowned for its emphasis on research and innovation (IIT Delhi). IITs provide research-focused programmes at the undergraduate, postgraduate, and doctorate levels, as well as research centres in a variety of science and technology fields. Similarly, the Indian Institute of Science (IISc) in Bangalore is the country's leading research institute, offering world-class research facilities and science and engineering programmes. These universities have played an important role in fostering a culture of research and innovation in the country, which has resulted in major scientific and technological advances (Bhattacharya, 2020). As a result, Indian institutions have made important contributions to worldwide research in a variety of sectors, including science, technology, health, and social sciences (Gupta et al., 2019). India has seven universities in the top 500 and two in the top 200 of the Times Higher Education World University Rankings 2022 (Times Higher Education, 2022).

An Evaluation of Five-year Plan Allocations for Research and Excellence in India

With several five-year programmes, India has a long tradition of funding university research and promoting excellence (Planning Commission of India, 1951-2017). The first five-year plan (1951-1956) concentrated on basic infrastructure development and university formation (Singh, 2018). The second five-year plan (1956-1961) earmarked funds for social sciences and humanities research, while the third plan (1961-1966) expanded funding to include scientific research (Planning Commission of India, 1951-2017). The fourth plan (1969-1974) provided additional funding for basic and applied research, while the fifth plan (1974-1979) attempted to improve collaboration between industry and academics and encouraged the formation of new research institutions.

The sixth plan (1980-1985) emphasised the importance of research in technical innovation and the development of new technologies, whereas the seventh plan (1985-1990) included funding for multidisciplinary research and the establishment of centres of excellence. The eighth plan (1992-1997) targeted research spending in growing fields including biotechnology and computer technology. The importance of private sector involvement in research and development (R&D) was underlined in the ninth plan (1997-2002).

The budget for basic and applied research was raised under the tenth plan (2002-2007), with a focus on research in areas of national importance. The twelfth plan (2012-2017) underlined the need for greater international collaboration and the establishment of global research networks, whereas the eleventh plan (2007-2012) introduced support for social sciences and humanities research (Singh, 2018). Finally, NITI Aayog from 2017 onwards adopted a strategy that sought to improve India's research and development (R&D), particularly in science and technology. To improve the quality of education and research output, the strategy stressed the development of innovation and the establishment of research institutes. It also prioritised funding for high-impact research and technology programmes (Government of India, NITI Aayog, 2017).

Research and Excellence through the Lens of New Education Policy- 2020

The New Education Policy (NEP) 2020 aims to transform Indian universities into world-class centres of research, innovation, and entrepreneurship. The approach recognises the critical role of research in improving academic success and generating socio-economic growth. To that end, the NEP 2020 has a number of provisions targeted at encouraging research and quality at Indian universities (Ministry of Education, Government of India, 2020).

To begin, the NEP 2020 emphasises the value of university research clusters and research parks in fostering multidisciplinary research and collaboration. This would make it easier for departments and specialties to share knowledge, talents, and infrastructure. The Indian Institute of Technology (IIT) Delhi, for example, has built a research park where researchers, entrepreneurs, and industry partners can collaborate and commercialise research outcomes. The park has aided in the development of innovative products and services in areas such as biotechnology, nanotechnology, and renewable energy.

Second, the NEP 2020 suggests creating a National Research Fund (NRF) to improve research excellence and university funding. The National Research Foundation would provide funding to academics and organisations depending on the quality and impact of their research. This will motivate institutions to prioritise high-quality research and innovation while also attracting and retaining talented researchers. In the United States, for example, the National Science Foundation (NSF) provides merit-based funding to academics and promotes scientific and technological growth through research excellence (University Grants Commission, 2018).

Finally, the NEP 2020 emphasises the significance of enhancing the university research ecosystem through the promotion of research culture, ethics, and integrity. This would entail giving training and capacity-building efforts to researchers, encouraging appropriate research conduct, and assuring transparency and accountability in research techniques. In India, for example, the University Grants Commission (UGC) has developed norms and laws to promote research ethics and integrity in universities, such as the UGC (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations, 2018.

The strategy emphasises the critical role of research in driving socio-economic progress and aims to create a robust research ecosystem that fosters interdisciplinary collaboration, recognises research accomplishments, and promotes research ethics and integrity. These policies have the potential to elevate Indian universities to world-class centres of excellence, contributing to global knowledge and innovation.

New Interventions

The Indian government has launched numerous initiatives to boost research and excellence. These approaches promote innovation and research and development ecosystems. Here are key interventions. India's 2016 "Atal Innovation Mission" (AIM) promotes innovation and entrepreneurship (Government of India, 2016). The purpose is to support technology, healthcare, and agriculture innovation, research, and development. The mission promotes innovation and entrepreneurship in students, entrepreneurs, and researchers. The 2018 "National Mission on Interdisciplinary Cyber-Physical Systems" (NM-ICPS) promoted cyber-physical system research and development (Government of India, 2018). India's economic prosperity depends on creating a strong ecosystem for research and innovation in this subject. In 2015, IMPRINT India promoted engineering and technology research. The programme funds healthcare, energy, and security research projects. The initiative seeks innovative solutions to national issues (Government of India, 2015).

Prime Challenges for Research and Excellence in India

There are numerous challenges to achieving excellence in research in the case of India. One such issue is research funding (Sharma & Sharma, 2021). Indian universities need to enhance resources to attract and retain top scholars, provide vital facilities and equipment, and conduct cutting-edge research. Another issue is industry-academia linkage and coordination (Bhatia & Singh, 2019).

The policies and programs should prioritise the provision for R&D companies' tax breaks could boost government research investment (Patil, 2020).

Industry-academic cooperation may rise, leading to more significant scientific advances. A National Research Foundation (NRF) might sponsor cross-disciplinary research. The NRF may encourage university-research organisation collaboration, resulting in more innovative research (Srivastava & Bhatnagar, 2021). Research parks and technology transfer offices help universities commercialize research and encourage entrepreneurship (Rai & Sarkar, 2021).

Moreover, Indian universities can adopt policies like those of the world's top universities to boost research and quality. Research funding, sophisticated infrastructure, and cutting-edge facilities can achieve this (Kadam & Patil, 2020). Schools can prioritise hiring world-class academics who are subject-matter experts and innovative researchers. These faculty members could then work with students and researchers on paradigm-shifting research projects (Mishra & Jain, 2021). Researchers should get an international standard salary for their work. Awards, fellowships, and other recognitions can also help (Kumar & Singh, 2021). These policies can help Indian colleges and universities compete with the world's top by creating a research-friendly environment.

The Indian government's New Education Policy (NEP) 2020 emphasizes Research and innovation. We have to create a robust funding mechanism to realise these aims. The researchers need to be provided with much better infrastructure, financing, and mentorship.

Conclusion

India as a developing country requires a higher education system that is more robust, inclusive, and environmentally friendly, and promotes accelerated economic growth. Innovation, the creation of new information, and the growth of one's abilities all depend critically on the quality of research and evidence-based development. By making investments in research and academic excellence, institutions of higher education have the ability to adapt to the shifting demands of society, educate a workforce that is prepared for the future, and promote sustainable development.

To set up a solid system for higher education, collaboration between the government, universities, industry partners, and other stakeholders is required. Hence, equity, access, research, and cooperation between industries and universities should be encouraged by policymakers. In addition, institutions of higher education need to implement curricula that are malleable and adaptable, invest in digital technologies, and place an emphasis on "soft skills" such as critical thinking, problem-solving, and communication.

Creating a higher education system that is robust in the face of adversity is challenging, but essential if we want to enjoy a successful and sustainable future. Higher education policies practises, and programmes need to be continuously reviewed, analysed, and modified so that they can continue to meet the ever-changing demands of society. India will be a world leader if the country will take care of these steps to establish a system for higher education that addresses future concerns, encourages diversity and inclusion, and maintains growth. Thus, multidisciplinary collaborative research is required to shape the future of research excellence In India, which will aid in gaining international recognition. It is important to remember that excellence is not innate, it is developed through perseverance, and that research is the key to academic excellence.

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Creating Research and Innovation Ecosystem in Indian Universities

S P Thyagarajan*

The higher education sector across the world is witnessing a series of breakthrough reforms to align with the developments and requirements of Industry 4.0. Higher Education (HE) and HE Institutions are the key drivers of socioeconomic development in the complex knowledge-driven global economy. Indian HE system is presently experiencing an unprecedented transformation through its structural and progressive reforms. New Education Policy--- 2020 of India is one such significant initiative that aims at universal access to quality education in tune with Sustainable Development Goal 4 of the United Nations Agenda 2030. NEP, when implemented at all levels in totality, would contribute significantly towards achieving three major goals of education: access, equity, and inclusiveness.

Indian higher education is the largest globally in terms of the number of institutions and the third largest and ranked as the top innovation destination in Asia. Further, our country serves as a significant destination for outsourced R&D activities. Yet our country has not tapped its fullest potential despite the demographic dividend and number of HEIs. India's gross expenditure on R&D is 0.65 % of its gross domestic product (GDP). Hence there is a need for India to improve its Research and Innovation contributions.

The ambitious reforms initiated by the nation would reap their fullest benefit only when the relevant stakeholder units align their activities accordingly. HEIs must be proactive in formulating and implementing necessary structural reforms to achieve academic excellence. HEIs must honestly relook at and reshape their primary activities: Research, Teaching, and Extension.

Situation Analysis of Research, Innovation, and Development

India has invested significantly in building its science and innovation base: supporting researchers at various career stages, creating new institutions and governance systems, offering interdisciplinary research opportunities, initiating large-scale infrastructure projects, and developing high-end research facilities. However, such activities are not equally poised to cover all sectors of Higher Education Institutions coming under the Government and Private sectors on one hand and between the central government and state-government-supported universities and colleges. The NEP-2020 anticipates the normalization of these divides.

Today, India publishes the world's sixth-largest number of peer-reviewed research papers; these numbers have grown at an annual rate of 14% compared to a global average of 4%. Though still under 1% of GDP, science funding has increased each year for more than 20 years. A National postdoctoral programme has taken shape with government funding of 2,500 postdoctoral fellowships a year. A startup ecosystem is putting down roots, and academia is building links with industry. However, there is significant diversity in the holistic picture of quality research productivity across the types of Higher Education Institutions (HEIs) in India.

Despite these efforts, the question remains: does India have an enabling environment to support researchers, at home and those who are returning from abroad in growing numbers? Institutional environments are a mixed bag, with few providing mentorship, flexible funding, and tenure. Most institutions are hierarchical. There is a diverse ecosystem.

A recent survey of scientists published in *Nature* showed vast leadership gaps with highly variable mentorship, training, and institutional support. An anonymous survey of Welcome Trust/DBT India Alliance Fellows tried to assess the situation in India. Of the 60 respondents, only about 50 per cent received formal or informal mentorship and career development support at their institutions. Significantly, 15 per cent also reported research misconduct cases in their labs, which were addressed through internal mechanisms. The survey also revealed inadequate support for academic leadership (40 per cent), lab management (35 per cent), data management (15 per cent), research misconduct (58 per cent) and technology transfer (53 per cent). Though all institutions in India provide some

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support for the financial management of extramural projects, only 18 per cent of respondents said their institution has a research development office. (Shahid Jameel & Savita Ayyar,2019). The university ecosystem picture is also similar to the UGC's 'Faculty Recharge' programme. (UGC, 2012)

According to the report of the National Institutional Ranking Framework, 2022 (NIRF, 2022) 77.10% of 59, 665 teachers of HEIs are Ph.D. degree qualified among the top 100 NIRF ranked HEIs; The same is only 46.91% among the 74838 teachers of the HEIs which secured NIRF ranks beyond 100. Similarly, 65.70% of 3,79,032 total publications were made by the top 100 NIRF-ranked HEIs, while the remaining 951 HEIs made only 34.30% of the total publications. Citation analysis of the publications made by these HEIs also indicated that 68.96% of the 72,901 highly cited publications were from the top 100 NIRF ranked HEIs, while only 31.04% HEIs that were beyond 100 NIRF ranks secured highly cited publications (NIRF Report, 2022)

The forgoing section reveals that there is extreme variability in research inputs like research funding, research manpower, and research infrastructure among the Indian HEIS which are reflected in significantly variable research outcomes. This variability is compounded by the grossly inadequate research leadership and researcher maturity. The process of addressing these inequalities could be reasonably called the creation of a 'Research and Innovation Ecosystem'.

Research and Innovation Ecosystem

The research and Innovation Ecosystem is the enabling environment, in terms of functional infrastructure, forthcoming and research-competent manpower, researcher-friendly research administration and ear-marked research-supporting institutional budget. These facilitate the transformation of *Innovation* into *Performance* and *Value Addition; Innovation* without *Value Addition* is not useful to the nation and its economy. Such an *Ecosystem* with *Collaboration* creates Research and *Innovation Ecosystem* which facilitates intra and inter-institutional collaboration and *Academia-Industry Partnerships.*

- *Research Development* (RD) is a set of strategic, proactive, catalytic, and capacity-building activities designed to facilitate individual faculty members, teams of researchers, and central research administrations in attracting extramural research funding, creating research collaborations, and developing and implementing a quality research ecosystem.
- *Research Governance* concerns setting standards to improve research quality and safeguard the public. It involves enhancing ethical and scientific quality, promoting good practices, reducing adverse incidents, ensuring lessons are learned, and preventing poor performance and misconduct. Research governance refers to the processes used by institutions to ensure that they are accountable for the research conducted under their auspices.
- Elements of research governance include ethical approval. compliance with legislation, regulations, guidelines, policies codes of practice and implementation of Research Implementation Management System (RIMS) software.

An Ideal Research and Innovation Ecosystem in an HEI will:

1) Evolve appropriate 'Research, Innovation Governance pathway' to transform 'Traditional Higher Education Institution (HEI)-1.0' to ' Integrative HEI-4.0' through the stages of 'Modern HEI-2.0' and 'Postmodern HEI-4.0'
2) Create an infrastructural, administrative, financial, functional and performance review ecosystem to facilitate a 'Deliverables-based Research-Innovation Governance system'.
3) Network with universities and autonomous colleges through 'Cluster System' methodology as recommended in NEP-2020 through joint 'Research and Innovation programmes, Joint capacity building programmes through workshops/ trainings/Faculty development programmes/ Research internships/exchange programmes of students and faculty members.
4) Adopt healthy practices to nurture and develop 'Academia-Industry Partnership' in the most realistic manner as a borderless collaborative 24/7/365 HEI-level programme.
5) Provide advisory services to Government, Public and Private Bodies, other HEIs and NGOs with evidence-based research outcomes and analysis platforms.

6) Ideal University R&I ecosystem: Policy guidelines.

7) Leadership with a practical R & D vision and strategy that is capable of responding to new opportunities and challenges.

8) Recognition of the right of individual faculty and other scientists to nurture and use their creativity and innovativeness with full freedom.

9) Protected faculty time for R & D/dedicated research-faculty guidelines.

10) Reward for good Research & Development performance.

11) User-friendly, Innovative Research Governance.

12) Quality Ph. D, Post Doctoral candidates and norms development for on-campus "Start-up companies" by faculty and researchers in pre-identified institutional thrust areas of R& D.

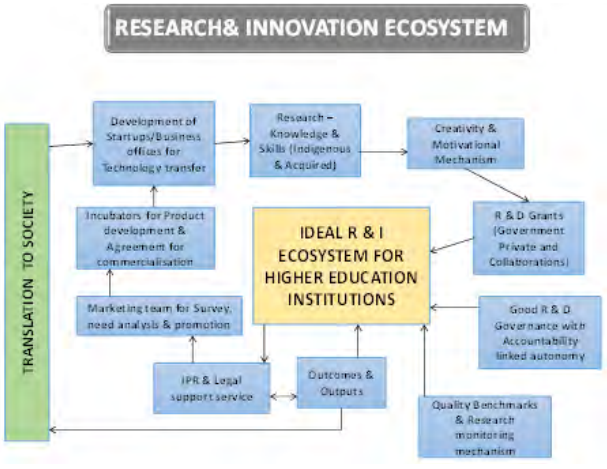
13) . Easy access to quality technology platforms, Discipline and thrust area-related research infrastructure.

14) A robust Research Mentoring system for students, entry-level and level-wise faculty members and researchers with updated capacity-building programmes

Research and Innovation Ecosystem Strategy

- *Process Re-engineering Approach* is proposed to enable radical redesigning of existing research and innovation processes to improve quality, quantity, speed, and outcomes and innovation. The Research and Development Centre of the HEI would develop module-based robust resource system.
- *Value Stream Mapping* to develop new processes for Research and Innovation Governance by mapping various activities based on their value additions created and by eliminating waste processes.
- *Tech-based Governance* to ensure credibility and momentum in research administration platform through, Research and Innovation Management System (RIMS), for effective execution and monitoring of R&D and collaborative research programmes/projects and innovation work.
- *Model Building* is intended in which a contemporary University Research Governance & Innovative Framework/Model (URGIM) shall be developed focusing on objective measurement of research and innovation, decentralisation, autonomy, and academic freedom. The framework would cover detailed guidelines on People, Funds, Policies, Ethics, Safety, Infrastructure, Administrative, Operational, and other aspects related to research and innovation.
- *Clustering Approach* would have to be followed to network with institutions and to pool resources of common interest. The centre would identify people with shared interests, skills, and expertise in various domains and conduct training, seminars, discussion forums, etc. This would facilitate intra-institutional and inter-institutional teaming to carry out transdisciplinary research.
- *Peer Mentoring System* would have to be designed to provide hand-holding support for teachers, non-teaching/technical staff, all levels of students and other needy HEIs to revisit and establish Research Innovation Governance in their institutions.

Methodology



Phase I -(a) Process Reengineering (PR) and Value Stream Mapping (VSM)

- Detailed study on the existing processes related to RIG and identify gaps
- workflow analysis
- Develop new processes for RIG through VSM
- Plan and implement allied routine activities.

Phase I- (b) Development of Research and Innovation related Policies for the HEI

- Research Promotion Policy and Schemes
- Resource Generation and Optimal Utilisation Policy;
- Consultancy Policy and Rules

- Intellectual Property Rights Policy
- Innovation and Start-up Policy
- Academic Integrity and Prevention of Plagiarism policy
- Publication Quality and Monitoring cum Review Policy
- Research quality guidance /documentation and quality analysis software
- Research cum Innovation -performance linked incentive system policy

Phase II -Developing the Functional RIMS

- Multiple Module-based RIMS
- Implementing & experimenting with the system with the research community
- Follow-up & success analysis
- Fund and audit/utilisation certification management module
- Dedicated, software-savvy manpower;
- Separate Finance & Accounts Division for R&D with appropriate technical manpower.
- Financial powers to the Dean/Director (R&D) of the HEI to handle all the grants secured through Funding agencies and extra-mural sources, without getting channelized always through Registrar/VC;
- Official decentralization of academic, administrative and financial powers to Dean/Director (R&D) and F&A division as approved by Statutory body of the University like Governing Council/syndicate/ Board of Management.
- RIMS should lead to Synchronous flow as per the demands of milestones/project deliverables.
- RIMS to ensure Expeditiousness, Transparency, Time-bound utilization of received funds and Accountability.
- Should facilitate timely submission of UC/Audited Statements of accounts to the funding agencies.

Phase III- Developing Functional Ecosystem for Research & Innovation among Scholars & Stakeholders

- Operational guidelines for carrying out research and innovation with ease as per the approved policies.
- Developing the full structure of RIG for promoting and functioning of research and innovation activities of the HEIs
- Facilitating promotive, hand-holding, quality-conscious, pan-institution functional ecosystem with embedded ethics, and accountability-linked autonomy.

Phase V -Developing the Research and Innovation Governance Framework

- This would involve processes for the recruitment and assessment of competent and motivated faculty, early-career researchers, Research projects Fellows, Ph.D. and Post-Doctoral Fellows and support staff.
- In order to facilitate these quality activities, setting up accessible and affordable infrastructure, and developing research management capacity by institutionalizing a dedicated Research and Development office with an ear-marked and empowered Dean/Director (R&D) with well-trained support cum technical staff is the priority requirement.
- In such endeavors, other stakeholders such as funding agencies also need to come forward to build partnerships with institutions. Hiring the right people, who fit the institutional culture and vision, and mentoring, nurturing and supporting them with adequate resources, is critical.
- Since most Indian institutions standardize input with varying output instead of the other way around, the quality of periodic assessments is variable, the Governance should have a performance-driven system of reward or analysis-packed criticism.
- Formal institutional mechanisms are needed to support research management and academic leadership. Expecting a researcher to be entirely self-managing is often detrimental. Indian researchers need to be sensitized about new roles that help balance the time they spend on research and administration. Research management includes a set of activities conducted at the boundaries of research and is now essential for optimal output. These include support to identify funding opportunities, managing programs, public engagement, impact analysis, and ethics. Research management requires blended skills, spanning academic, creative, and administrative functions.
- Workshops have highlighted issues with the sustainability of careers in research management and the challenges of building formal networks and

training, given the relative scarcity of institutional research offices. This is being followed up with ways to connect research administrators locally via online working groups, courses and networking events. An international networking opportunity for research administrators is essential since they will show best global practices.

- Most science is technology-intensive, making it difficult for an individual or institution to master or afford everything, underpinning the importance of cutting-edge core facilities, technical support, and collaborations. Funders must establish such facilities and institutions require practices that encourage their use. Research and Development centers need to support raising and managing funds for shared facilities.
- Good leadership demands a vision, awareness of one's strengths and weaknesses, and the ability to form partnerships and manage conflicts to achieve that vision. This requires marshaling resources, whether facilities, funds, or people. These skills do not come naturally to researchers, who take on administrative responsibilities in addition
- to their research, often without training.
- Indian science needs to connect better with global efforts to address problems unique to India, but relevant in the global context, and to ensure that research capacity is built in a sustainable manner. A robust ecosystem is needed for India to fully participate in global science, through visionary leadership, enabling practices, global visibility, mobility and support for building partnerships, the ability to gain and manage funding, and public engagement.

Phase VI Formation of Research and Innovation Clusters

- Creating clusters of common interests, skills, and expertise in various domains through intra-institutional, and inter-institutional across the country and outside the country
- Creation of online Directories and Discussion Forums
- Signing of functional Memoranda of Understandings with partner HEIs/R&D institutions/Industries etc., with ear-marked faculty /R&D personnel from either side of the MoU partners to drive the implementation of the objectives of the collaborations.

Phase VII -Establish Peer Mentoring System

- Prepare mentoring policy and manual
- Conduct capacity-building programs
- Train mentees on URGIM
- Share best practices in RIG

Academia-Industry Partnerships

Academia-Industry Collaboration is the most often repeated slogan across India equally by Higher Education Experts, Policy planners, Governmental agencies and politicians. It is also said that this collaboration alone can bring about a 'technology push' matching with 'market pull' using the universities as 'light houses' for Industries.

Funding agencies like DST-DPRP, DBT-BIRAC & CSIR, support various models of Academia-Industry collaboration, like R&D contract projects to academia by industry; setting up of TBI, Industry-Innovation Centres in academic institutions after building up capacity & skills to both academic & industry partners besides major joint drug/ devices discovery and validation programs. Recently, the proactive programmes of the Government of India like 'Make in India', 'Start-up India', 'digital India', 'Smart cities', 'Smart villages' etc. to provide the scope and financial assistance to foster talents of the youth and to bring about Academia-Industry collaboration. In spite of all these, strong academia-industry collaboration has not evolved in quality and quantity as a culture across the universities and other higher education institutions in India.

If we look at the scenario in foreign universities and world-class universities and institutions abroad, one can see 'Research Parks' present on campus. In these universities, New Technology-based Firms are born on university campuses. For example, Yahoo, Google, CISCO and more than 300 companies are born at Stanford University. Universities in Europe, Australia and China are also following the same culture.

In recent years, China has established more than 300 research parks in universities.

The Primary Aim is to Institutionalize Successful Academia-Industry Collaboration

It is to provide a user-friendly and encouraging ecosystem and governance with the singular motive of forging an ambience of voluntary collaboration & cooperation between Academia and Industry so that seamless progress takes place without any bottleneck. There is an urgent need to have synergy between academics and industry researchers since academicians can lend conceptualization and generalization skills and the industry can provide product development, technology transfer, and commercialization skills through which the conceptualization can be translated into products. It requires a great deal of solid interaction to avoid any communication gap.

The Gaps

However, as per the present situation, our Indian Universities and Industries are not able to establish neither such partnerships nor 'Research Parks' on the University Campuses? The outmoded governmental bureaucratic hurdles and restrictions of Statutory Councils' norms on the functioning of Higher Education Institutions, along with the conservative governance system in the individual university strangulate the successful conduct of the University-Industry collaboration programs.

Ideal Industry-Academia R&I Development Ecosystem

An ideal Research and Innovation Ecosystem in Indian Universities to achieve active and productive collaboration with Industries needs to have seamless connectivity supported by infrastructure and mentoring by institutional management. The following are the building blocks of the proposed Innovation- eco-system:

(i) Research & Development of Knowledge and Skills (both indigenous and international) through Partnerships.

(ii) Creativity & Motivational Mechanism.

(iii) R & D Grants from Government/Industries and NGOs

(iv) Good R & D infrastructure, Governance with a Timeline-based Accountability.

(v) Quality Benchmarks for R & D

(vi) Outcomes and Outputs Co-efficient Analysis.

(vii) IPR & Legal office.

(viii) Business Development and Technology Transfer for Market- Survey, Need Analysis and Translational Support.

(ix) Incubators for Product Development and Translation

(x) Development of 'Start-up companies and

(xi) 'Angel Investors/Venture Capital Funding. Only then, there can be successful R& D translation from academia–industry.

To achieve this ecosystem, both universities and industries in India have to internationalize their strategic planning and implementation road-map as described here.

(a) Implementation of a Multidimensional Research & Innovation Ecosystem to Nurture Academia-Industry Collaboration

i) Both academic and managerial Leadership of the universities should plan with a practical research and development vision and strategy that is capable of responding to new opportunities and challenges

ii) Recognition of the right of individual faculty and other scientists to nurture and use their creativity and innovativeness to the fullest in the university departments.

iii) Curricula for educational and training programs to be developed jointly by academia and industry and also offered jointly in an integrated methodology of student learning both at the academic institution and at the industry settings. Only then 'industry-ready' employable manpower can be generated.

iv) Protected faculty time for research and/or dedicated research-faculty.

v) Reward for good research and development performance as evidenced by patents and other IPRs

vi) Time-line based, Innovative, and facilitative Research Governance.

vii) Quality Ph. D and Post Doctoral candidates with industry work-integrated collaboration in cutting-edge programmes on pre-identified institutional thrust areas.

viii) Easy access to quality technology platforms, discipline, and thrust area-related research infrastructure through collaboration and cooperation

ix) Brand value of the institution to attract research-interested faculty and post-doctoral students and industry partners.

x) Hassle-free research training and capability enhancement possibilities at all levels of the faculty to understand and adopt industry expectation for time-bound deliverables as institutional culture

xi) A walk-in ambiance for Industries in academic institutions to forge collaboration, without any institutional restriction in approvals for teaching and R&D programmes with industries; similar complementarities by industry partners are equally important

xii) Mentorship for successful Academia-Industry partnerships

(b) Private Sector Participation – Lessons from Computing

The industry contributes 30% to India's total R&D which is devoted to improving productivity and reducing cost & energy consumption. No basic research support for product/process development is a priority because of present government rules. User-friendly PPP models in India are also not proactively encouraged. Another area of concern is the industry's apathy and disinterest towards academics and collaboration with them. Change in this climate needs to be innovatively nurtured by both governments / academic institutions and industries. The success story of the IT sector could be emulated in other areas. IT has got boosted because of TCS, Infosys, WIPRO, Microsoft, etc., which have programs R&D for young computer scientists. Similar models have to be replicated by major Indian industry houses for Science, Technology, Environment, Agriculture and Medicine (STEAM)

The scheme of "Corporate Social Responsibility (CSR)" has made it obligatory for every industry to invest two percent of its profit in social activities like education, and health etc., If the university and industry synergises, make the shared vision and collective ambition through CSR and jointly establish Innovative projects like Research Park/Innovation Park, Corporate Education Centre, Entrepreneurship Development Centre, Incubation centres for Start-ups, Patent/IPR centre and Business Development/Technology Transfer offices, an ideal R&D innovation ecosystem can be developed. India can then only be a globally competent R&D hub for the youth of the country.

(c) Interaction between Industry and Doctoral Programmes

In the Pharmaceutical industry, Pharmaceutical education is a foundation for its structure. For example, R&D and pharmaceutical technologies are built up by supplying qualified pharmacists to the industry. The interaction should begin when researchers are doctoral students and should continue well after they start their careers.

Some institutions fear that if students are involved in industry work, it might distract them from their course work. However, many professors and faculty are willing to put this fear aside. They may realize that allowing students to be involved with industry could have very positive benefits. Not only could it boost doctoral productivity/output, motivation, and potentially lead to a job (or even a start-up company someday), it would further foster the academia-industry relationship as the cycle continues with new post-docs and grad students.

Those who cannot secure academic positions will seek out industry positions and will need to acquire necessary skills, knowledge, and experience in order to successfully break into industry. Industry provides research topics, funding and access to data for research. Industry also provides an opportunity for employment outside the traditional academic setting.

(d) Academia-Industry Interaction Should be Considered as Part of the Education

These classes should not be taught just by the school of business from people who lie ONLY in academia and know nothing about industry. *There should be industry PhDs teaching these classes* since they bring to the table real-world experience and examples.

Also, with the presence of industry PhDs on campus, this should foster some sort of relationship. More importantly, this would allow for recruitment of outstanding candidates who lie in academia and are looking to break into industry. Keep in mind that grad students and post-docs aren't the greatest at networking, so this would also allow for some exposure outside of their mundane lab environment.

Apart from classes, biotech/pharma/healthcare industry needs to be on campus with clear offerings for internships. The incentive is that you are recruiting the best and brightest to strengthen and grow your company. How can you possibly obtain industry experience while in grad school without an internship? How can you

possibly compete against someone who has a Ph.D. with industry experience and was just recently laid off?

A 3-month summer internship would dramatically increase a post-doc's or grad student's chance of landing a job in the industry in this down economy. But until an academia-industry relationship is fostered on all levels, there will be little incentive to help struggling post-docs and grad students by offering internships and optional coursework that could give them an edge. *This is definitely an employer's market and they know it*. But ignoring the problem that there is a growing gap between academia and industry will only hurt our economy further and leave more people unemployed.

A list of Sample Coursework (With Industry Sponsor): *Financial Accounting Principals, Corporate Finance, Organizational Behavior, Bioscience Strategy, Market Assessment and Market Strategy, Business Operations, Clinical Trials Design, Conduct and Strategy, International Business and Global Health, Entrepreneurial Management, Applied Entrepreneurship, Product Management, Bioethics and Law,* etc.

(e) Industry Team Project: Real World Experience

At the completion of one's coursework, there should also be a final 'Industry Team Project' where students are to solve a real-world problem in the industry. An Industry sponsor should assign the Team Project.

In order to ensure that the teaching programs and the curriculum meet the challenging needs of the industry, senior personnel from the industry should be involved as expert members of the committees which vet changes in curriculum as well as new academic programs. To provide real-life exposure to the industrial world to its students, a "vacation training program" (similar to an internship) can be organized. The program can include industrial training of faculty and students with a built-in provision of incentives as well as for the appointment of adjunct faculty from the industry.

The provision of having honorary professors/ faculty both from the industry and R&D organization gives exposure to the students interacting with working professionals. The NEP- 2020 recommended and implemented through UGC the guidelines for "Professors of Practice" from the above sectors

The industry can hire a significant number of students. This is a highly effective form of technology transfer. While working in the industry, students frequently return to universities and colleges to recruit new students.

(f) Industry and Government Research Relationships

Many researchers are working in advisory or consulting capacities with a number of companies. In some cases, principal investigators in research hold positions on the technical advisory board. Large-scale collaborative projects are also being carried out in certain institutions. These should create opportunities for enlarging the scope of 'Industry-immersion programmes' as institutional programmes

(g) Summer Camps/Boot-camps

These can be arranged in collaboration with the industry to expose the students to various academic and extracurricular activities. As mentioned above, these can comprise a series of lectures and presentations from distinguished professionals from the industry and academia, video shows on some industry projects, group discussions, debates and a field trip to some industrial companies. These camps serve as a forum for the development of overall *personality, leadership, organizational skills and exemplary teamwork* which are essential for a successful career in addition to academic activities.

(h) Provision for Scale-up Operation and Entrepreneurial Ventures

Students develop new products or processes which are restricted to bench experiments. Due to the non-availability of scale-up processes as a result of capital and operational cost, the research is not able to reach the market. Interaction and informal tie-ups can ensure the successful implementation of work developed in the institution.

(i) Consultancy Services

Academic institutions can help industrial companies by providing consultancy services which are sought by small-scale entrepreneurs having no access to R&D and quality control facilities. It can be in the form of an evaluation of products, processes, software development, etc.

Research Leadership and Skills

This would be a solid start in making a 'Researcher' a more competitive and productive research leader.

- ***Communication*:** One of the most important things about leadership is that communication

is key. Leaders must be able to clearly articulate their goals and expectations to their teams and stakeholders, be open to feedback, recognize the team for successes, and reassure them of failure.

- ***Building Relationships:*** Relationships are about building trust with others so that the Research leader can have a network that one can use to give and receive support and knowledge. Strong relationships help one to work better in teams and find opportunities such as jobs, funding, and mentorship. The biggest challenge for the 'Research leader' in developing leadership skills was not having a mentor who had followed a similar career path.
- ***Strategic Thinking*****:** The effective mentoring system can offer training in strategic thinking when working in academia, but having a plan in place that defines goals; approaches that one will take to reach the goals; time-bound, measurable objectives that define the desired outcomes; and the tools that one will use to do it all ensures that the team knows expectations and the plan to get where a researcher-leader need to go.
- ***Project Management*****:** Delegation is a necessary part of good project management. Not delegating elicits frustration and self-doubt in team members with specialized skills. Other platforms are available specifically designed for research project management, which must be used and all 'Research Leaders' should get trained in these platforms.
- ***Time Management*****:** In academia, researchers have very little formal training on time management but it's a critical skill to being an efficient and effective 'Research Leader' in any workplace.
- ***Financial Discipline*****:** Knowing where to find funding, how to stay within restrictive budgets, and what is required for reporting will help the 'Research Leader/Researcher' to get the next budget approved.

Recommendations for Industry-partnered R&D Innovation Ecosystem in Academic Institutions

- Increase awareness of the establishment and use of Innovation-Incubation centres in universities;
- Establish industry R&D centres within the campuses of universities;
- Facilitate 'Start-up Culture" in academic institutions and allow them to be incubated in the Innovation-Incubation Centre coupled with the University Science Instrumentation Centre.
- Establish IPR cum technology transfer offices.
- Nurture the culture of collaboration in universities.
- Provide free access to researchers from colleges to all the above facilities in universities
- Establish knowledge networks.
- Provide incentives for scientists, academics, research institutes and private companies involved in Applied R&D;
- Multi-institutional/multi-disciplinary R&D Consortia among Universities and free access to innovators from the non-university community.
- Set up market-research facilities to assess the Commercialization potentials of the R&D products and processes.
- Adopt the national and international norms and policy guidelines on IPR and Financial benefit sharing for consultancies and industry-academia collaborations.
- Initiate concentrated efforts to establish "Industry on Campus" through "S&T Research Parks in HEIs.

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Expected Outcomes

- Transformation of host Institute to Integrative HEI - 4.0 through meticulous RIG
- Streamlining of various administrative, funding, operational activities related to research and innovation
- Technology adoption in RIG
- Dialogical research processes dealing with inter and transdisciplinary action, co-creative and societal research
- Mentoring other HEIs for similar transformation
- Global action university status ❐

Higher Education and Research for the New Age

P B Sharma*

"With the all-pervading nature of technology and mind-boggling innovations unleashed by the genius of man in the new age of hyper-connectivity and knowledge explosion, coupled with the ever-rising concerns for the wellbeing of humanity and protection of environmental health, newer models of higher education for the learners of the new age are needed. The new age offers great opportunities but also monumental challenges, that include major disruptions caused by technological innovations on one hand and the rising need for compliance to sustainability in all walks of human endeavors. The universities in India, and across the globe are required to gear up to respond to this dire need and shape themselves as the universities of the new age. The Author presents the strategic framework for transformational reforms in higher education and research in the universities of today to greet the new age challenges and make higher education and research a major game changer for creating a new world of blissful engagement and happy living on planet Mother Earth".

During the last two years, the world has witnessed the devastating impact of the Corona pandemic. COVID-19 that forced nations around the world, without exception, to take force measures including prolonged lockdowns and acknowledge the fact that the power of the microbial kingdom is more lethal and devastating than the power of guns and missiles invented by a man so far. It forced businesses and industries to close and left out countless workers to lose their livelihoods, and in a country like India, even the means of transport came to a grinding halt. It forced migrant workers to walk empty pockets with their families to their native places in rural India, which once sent them to the towns and cities several hundred miles away from their natural habitat in search of jobs and livelihood in modern metropolises.

As per the World Health Organization, Corona Virus dashboard, as many as 758.4 million confirmed Corona cases were reported from around the world, which resulted in an estimated 6.86 million deaths attributed to Coronavirus. The devastating impact of coronavirus on human health is, however, not restricted to deaths alone as its continued influence on human immunity and the threats arising out of the mutations of Corona Viruses are still to be more accurately assessed. But one thing is clear, the pandemic had a pronounced effect on the mindset and the attitude of people towards their life as well as their livelihood. COVID-19 has also impacted the social life of the younger generation and their aspirations and ambitions. On the economic front, the global economy lost as much as 8.5 trillion US dollars during the two years of the COVID pandemic, amounting to 6.7 % 0f the world GDP. In India too, the economic loss was estimated to be Rs 32000 Crores (US $ 4.0 billion) during the first 21 days of the complete lockdown in March-April 2020. An estimated 140 million urban workers lost their jobs, while salaries were cut for millions who were kept on a roll in COVID times and beyond.

The universities were shut down and were forced to reinvent the way education is to be imparted to the tech-savvy, new-age learners, who embraced technology and tech innovations with ease and speed. These new-age learners belong to the 21st Century, a century of people that thrives on the capabilities of its people and on the power of their ideas. For them, PCM does not only mean Physics, Chemistry, and Mathematics but also People's Capabilities and their Maturity. What's more, they belong to an age that offers a smoother and level playfield, when it comes to acquiring education in the digital age and with the vast body of knowledge being easily accessible to anyone having connectivity and digital devices like laptops, smartphones, tablets, etc. No wonder the new age learners got more easily adjusted to online classes as well as online examination platforms which the universities in India switched over soon after the pandemic. The good part was that the hesitation to use technology to deliver a service as vital as classroom teaching, disappeared much faster as the teaching community had no other option but to use technology for online teaching as well as mount a whole lot of student services. The corona pandemic thus turned out to be a blessing in disguise for universities worldwide, notwithstanding the horror of the pandemic.

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But then COVID-19 was not just to force businesses, corporates, industries and universities to shut down but also to send a powerful message to our minds that the way we have decided to develop this world of ever-rising consumption, increased pollution and ruthless onslaught and exploitation of nature would not be allowed to continue, as the Nature knows how to herald man's quest for escalating greed and exploitation of Mother Nature. It was also quite clear that during the period of Corona Virus lockdown, the air quality was so much improved that the sky turned blue, and the peaks of the Himalayas were visible from as far as Jalandhar in Punjab and Saharanpur in Uttar Pradesh. What's more, with the factories shut and businesses and corporates closed, the holy rivers of India including the Ganges, Yamuna, Godavari and Kaveri among others were flowing with unpolluted water after several decades of water pollution. But then the lessons learnt during the pandemic were swiftly forgotten as life returned to almost normal after the prolonged pandemic. The care and concern for the environment as well as the well-being of the people at large once again became secondary to the urgency of rapid recovery of the economy from its deep downfall during the pandemic days.

It is also important to note that the post-pandemic world is witnessing global recession and job losses besides causing monumental challenges of reviving the global economy. But one thing is clear the post-COVID world has ushered us to a new age, a new world order in which the all-pervasive nature of technology and mind-boggling scientific advancements and technology innovations are forcing us to reinvent the transformative reforms in all sectors of human endeavor, including the way education is imparted and research is carried out in universities and institutions of higher learning.

In this new age, it is important to focus on creating new avenues for the blissful engagement of the vast humanity that includes around 600 million youth below the age of 25 in India alone. These new-age learners are looking for a learning environment that makes them capable of greeting the new-age challenges, capturing the great opportunities that the new age offers and shaping them as outstanding human beings deeply caring and committed to creating a peaceful and compassionate world. The education for the new age must therefore go beyond creating hype of ML and AI and configure ways and means to create outstanding human beings capable of creating and sustaining the new world order of happy and healthy living on planet Mother Earth in peace and harmony.

It is equally important to foster inclusive and sustainable economic growth assuring high quality of life for billions around the world along with the least possible damage to environmental health. In this new world order, education, especially higher education and research in colleges and universities are being increasingly recognized as a major game changer to empower the world with human capabilities and technologies to sustain our continued march on pathways of human excellence and assure higher levels of sustainability in production systems and services. But then, education cannot and should not merely be focused on economic growth, it should alongside build a caring and compassionate humanity and responsible citizenship that is so essential to create peace, harmony and happiness around the globe.

New Age: The Age of Uncertainty but Also Innovation Infinite

It goes without saying that the new age is the age of uncertainty but also great opportunities to create a much better world than the world it was in pre-covid times. It is also an age of great disruptions caused by the rapid growth of innovative technology platforms, But then here it will be important to realize that innovations are a great power to create, and create faster and better than the destruction it causes. Hence, the focus of innovation should be to utilize the power of innovation to create a new world in which technology creates employment, new demands for energy efficiency and environmental compliance but also great gains for accelerated economic growth and development with sustainability and inclusiveness,

But unfortunately, innovative young minds often are seen as jumping on their feet as they see great disruption being caused by their innovative technology application platforms. Digital technologies are to be perceived as being a great friend of humanity at large as they promote transparency and trust so vital to creating a fair and just global society. But for every great good, there is a great threat of misuse and misguiding. It would be prudent for higher education in the new age to pay greater attention to aspects of cyber security and information integrity, or else the

digital technologies assisted by the newer tools of machine learning and AI shall create more misery than the comfort and efficacy they intend to create.

Integration of Ethics and Morals in Smart Machines and Systems Needed

It is here we need to foster in our universities new tech innovations such as technologies of conscience for smart machines and systems. We need to develop new, smart, and intelligent devices with embedded technologies of conscience that besides creating the ease of doing business also positively impact human behaviour to protect them and the planet from the misguiding and misuse of the enormous power of technology and pave the way for increased sustainability, empathy and compassion, so important for a blissful life on planet Mother Earth. Special attention is needed for the development of new tech innovations on the campuses of the universities where the younger minds need to be sensitized about their importance at an early stage of their life, Aishwarya Sharma and Pritam B. Sharma (2022).

Further, much of the uncertainty that prevails today, a cause of major concern is also largely because of a lack of understanding of the imperatives of the new age by the leadership of the day. The new age demands a caring and compassionate leadership that cares for its people, and settles the disputes, if any, through dialogues and coming together with its opponents at a common table to negotiate. War is no solution in this new age of transparency and easy access to technology-integrated and smart warfare devices such as smart and intelligent drones and smart surveillance systems capable of analyzing and assisting modern warfare. The new-age higher education in business schools and management institutions need to focus on creating new-age leadership that cares for the planet and the people and nurtures the world as one global family akin to *Vasudhaiv Kutumbakam*, the motto of G20 Presidency of India this year in 2023.

Higher Education for the New Age Learners

Having narrated the imperatives of the new age and the great opportunities that lie ahead, let us look at transformative reforms that are needed to foster new age education for the new age learners in universities and institutions of higher learning here in India and around the world. First, and foremost, is the need to acknowledge that the current curriculum structure that largely focuses on imparting knowledge as it exists is no longer apt for the new age. The new age education is to be more about capabilities to assimilate the existing knowledge, cause deep learning and critical thinking to utilize it for performing the work activity most efficiently and most effectively. The education of the new age should be largely about nurturing creativity and innovativeness that people have in their genes and also providing them with an environment of bringing out their very best and manifesting their innate potential.

UNESCO in the early dawns of the 21st Century had outlined the need for transformative reforms in education to foster an environment for not just 'Learning to Know', but also 'Learning to Do' and 'Learning to Live Together'.

The UNESCO report of the International Commission on *Reimagining our Futures Together: A new Social Contract for Education (2021)* strongly argues that 'Since wars begin in the minds of men and women, it is in the minds of men and women that the defences of peace must be constructed". Naturally, where else other than in educational institutions, we shall have the opportunity to construct such defenses in the minds of our students to avert war and its agonies and create peace-loving communities and nations.

The UNESCO Report further outlines that "Education has long played a foundational role in the transformation of human societies. It connects us with the world and to each other, exposes us to new possibilities, and strengthens our capacities for dialogue and action. But to shape peaceful, just, and sustainable futures, education itself must be transformed. The new social contract for education must unite us around collective endeavors and provide the knowledge and innovation needed to shape sustainable and peaceful futures for all anchored in social, economic, and environmental justice, the report further emphasizes. In many places around the world, rapid technological changes are transforming many aspects of our lives. Yet, these innovations are not adequately directed at equity, inclusion and democratic participation says the UNESCO Report (2021).

Curriculum for Peace and Harmony

It may be worth realizing what the Nobel Laureate Albert Einstein said: "Peace cannot be kept by force; it can only be achieved by understanding."

This tells us about the need to educate youth about the importance of peace and the benefits that come with it. We need to make them understand during their studies in universities and colleges how to nurture a peace-loving society and practice peaceful coexistence. After all, much of the attitudinal and behavioural transformation takes place in students during their studies, more during their college days when they have an environment of autonomy and freedom to shape themselves the way they wish to be in future. The new age education has thus to, from now onwards, necessarily take on board and that too in a substantial manner the education for peace, inclusivity and above all integrity and sustainability. The curriculum for peace, inclusiveness, integrity and sustainability needs to configure with its universal appeal and effectively integrated into the overall framework for the new age learners. This will also pave the way for designing the strategic framework for education for the new India of our dreams and the new world in which we wish to live as global citizens of a peaceful, happy and prosperous world.

Research for Inclusive and Sustainable Development

The new age research, like new-age education, also needs to undergo a transformative reconstruction in its focus and in its goals and objectives. For the last many decades, university research has been focused on strengthening the industrial revolution and creating mega corporates, in turn creating great economies. But then economic development alone cannot be the objective of university research. The university research needs to serve the larger objective of creating a fair and just society free from inequality and disparities.

The university research also needs to turn its focus on what is needed for happy and healthy living for the vast humanity, without destroying the beauties of nature and its resources. It is here, a renewed focus is needed for research for inclusive and sustainable development. Research that supports the growth and advancement of green technologies and makes the circular economy a reality for achieving great goals of net zero emissions and zero waste discharge. Unfortunately, after the Second World War, the research in science and technology became more heavily aligned to the needs of industries and corporates and less towards the needs of society and the calls for protecting the health of the environment and the people on the planet. Compared to this, scientific research and technological innovations in ancient India were focused on the science of life and technologies for human health and well-being. Ayurveda was the science of healthy living, and the food technologies were a guarantee to nourish a healthy body, a healthy mind and undoubtedly a happy soul. The focus on food and food products was so well integrated with natural medicines and nutrients that formed the basis for good health and well-being for a good 100 years of lifespan for humans. The care and concern for nature and the protection of the environment were deeply integrated into education and research in ancient India. We need to go back to these basics and thus reinvent modern science and technology-based tech-savvy education and research for the new India and the new world of peace and prosperity. Let the hype of automation, machine learning and AI-assisted smart devices and systems not sway away our attention to education and research for good health and well-being for the new age developmental goals.

Our age-old traditions of living a life full of divine bliss and happiness were intrinsically related to paying our greatest attention to the regular practice of yoga and meditation, consuming sattvic plant and cereal-based diet value added with cow milk and milk products, further supported by natural medicines integrated into our food as herbs and spices. These together with righteous conduct and a self-regulated lifestyle created an inspired humanity devoted to cultivating human excellence and utilising human life as an opportunity to serve, innovate and excel. We need to integrate such an emphasis on life sciences in our curriculum for education for new India and research for the development of a healthy and happy society.

In the famous Ayurveda, the Vedic text on the science of healthy living, we find a great emphasis on the happiness of the soul as a tacit condition for maintaining a healthy body and a healthy mind. In fact, the happiness of the soul works wonders for curing even chronic ailments. Today, it is important for us to make our souls happy and obey their commands to lead a happy and blissful life. The soul within us guides us to do good and to remain on the side of a heart full of compassion for others and a mind devoted to innovating and excelling in the service of man and Mother Nature. You may ask, in what language does the

soul communicate with us? The soul is our best friend, and it communicates with us through our feelings and the expression of our emotions. When we listen to our soul and follow its commands for righteous acts and good deeds, happiness glows on our faces. However, when we act against our conscience and disobey our soul, we feel guilty, and our face reflects that guilt. In the famous Bhagwat Gita, we are ordained to regulate ourselves through self-discipline, "*Aatmasanyam*". A happy soul also inspires us to devote our time to classical music, classical performances, prayers to the divine, and connect with empathy, *Aatmiyata*, with the diversity of the beautiful world around us. A simple stroll through the park's greenery enables.

The yoga and the meditation were not merely gymnastics of body and mind but in a true sense a time-tested scientific system of creating a healthy mind and a healthy body, as also to cultivate *Aatmasanyam*, the self-discipline, which holds the key for a happy and blissful life. The *Asthanga* yoga of Pantanjali *Yogsutras*, further inspires us to observe and practice Non-violence, *Ahinsa*, Truthfulness, Satya, Sustainable consumption, *Aparigriha*, Containment,*Santosha*, maintaining purity of mind, a mind free from ego, yet fully committed to serving the society and Mother Nature. The university education and research should create a profound understanding of the time-tested life sciences such as yoga and meditation and should create our abiding faith in the *satvik*, the righteous way of life that revolves around the purity of mind, simplicity of means, the integrity of actions and sustainability of systems and processes employed for a happy and healthy construct of a peaceful, compassionate and a developed human society.

Concluding Remarks

The valued agenda for universities in India to foster education and research for the new age is summarized below:

i. Focus on learning by doing along with deep learning to discover the application of knowledge and its relevance to contemporary and future needs. Prepare the students to be industry ready as well as future-ready by collaborative teaching and learning on new and emerging technologies.

ii. Inspire Students as well as faculty to understand the meaning and purpose of learning to live in harmony and design programs and activities to promote peaceful co-existence.

iii. Recruit knowledgeable and research-driven teachers having high intrinsic motivation, and self-motivation to nurture talent and excel themselves.

iv. Reach out to the neighbourhood, society and partner in developing civic sense and responsible citizenship in the students and all associated with the university/institution.

v. Redefine the meaning and purpose of research for creating and sustaining a peace-loving society where happiness and prosperity go together in harmony with nature.

vi. Target R&D to solve research to real problems facing the society and industry and assure high relevance of research for supporting the growth of sustainable and inclusive development. A much greater focus on the development of green technology innovations is needed to strengthen our nation's resolve for fostering a circular economy.

vii. And lastly, give greater attention to nurturing Indianness - aligning to peace, harmony, respect for life truthfulness, purity of mind and connecting with each other and with nature with *Aatmiyata*.

The above *Saptapadi Ucchatar Shiksha*, seven-fold action plan should enable our universities to rise to the ladder of quality, relevance and global esteem alongside making a great contribution to the nation building.

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Creating a Robust Research Ecosystem on Campus: Strategies for Universities

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Creating a robust research ecosystem is of vital importance for universities and academic institutions. It can help academic institutions to attract and retain top talent, promote innovation and research excellence, and contribute positively to society (Moore et al., 2017; Tucker & Parker, 2020). A strong research environment can help improve the reputation and ranking of the university, attract research grants, and provide opportunities for partnerships with other institutions, industries, and government agencies. These partnerships can help address some of the global issues including climate change, healthcare, and technology (Heaton et al., 2019; Kashif et al., 2022).

Research plays a crucial role in transforming the careers of students and universities (Pee & Vululleh, 2020). When higher education institutions establish research labs and facilities and commit themselves to engaging in quality research, they take the first step towards moving from good to great. Conversely, a university without research commitment is no different from an undergrad college. Research on important and trending research topics attracts global attention, resulting in increased institutional visibility and reputation (Mohrman et al., 2008). As the university's research in particular fields gains prominence, it attracts quality students, faculty, research grants, and media attention. Cutting-edge research at universities encourages investment, with the government and businesses often giving grants and funds to research institutions to help them buy sophisticated equipment. These facilities are often made available to students, enhancing their academic experience. Grants and contracts provide the institution with the funds it needs to pay the salaries of its research staff and students, often creating new jobs in the process. Research institutions can also attract new industries to their regions or states through their reputation, expertise, and infrastructure. They can establish and nurture start-up businesses or sell their innovations to other businesses under license. Collaboration between industry and academics is also essential for fostering innovation, technological advancement, and creating a skilled workforce. Good teachers integrate their teaching and research efforts to their mutual advantage in a manner that excites and engages students. In this manner, the next generation of scholars is trained, research and discovery advance and the cycle is maintained. University research can also have a significant impact on a student's life and career. Both undergraduate and graduate students can participate directly in research and keep abreast of the ever-changing research trends and emerging ideas in their respective fields (Petrella & Jung, 2008).

Many well-known rankings tend to correlate institutional quality with their scholarly output, which is measured by the number and impact of their publications in peer-reviewed journals (Pavel, 2015). The quality of infrastructure and scientific collaborations are of the utmost importance in enhancing scientific productivity and visibility, which are also important components of university ranking systems. Quality research is one of the constraints and challenges that the Indian education system faces. Except for a few prestigious institutes, most institutions in India present a bleak picture in terms of research quality and quantity (Naik, 2019; Sharma & Sharma, 2015). Considering the fact that India has globally acclaimed brain power, it is the responsibility of all higher educational institutions to create an optimal environment for academic research.

Developing a Research Culture

Encouraging a culture of research excellence is crucial for institutions and organizations that aim to make a meaningful impact in society. This requires a thoughtful and sustained effort to create an environment that values and supports research, and where researchers are encouraged to engage in high-quality research (Anderson et al., 2011; Olvido, 2021). By providing resources, support, and recognition for outstanding research, institutions can foster a culture of excellence that will lead to more impactful research outcomes and benefit society as a whole (Bayuo et al., 2020). Academic institutions should encourage faculty and students to conduct research that addresses real-world problems and has a positive impact on society.

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To create a vibrant research ecosystem on campus, there are several steps that higher educational institutions can take. Some of them are presented here.

Establish A Clear Research Strategy

Establishing a clear research strategy is a critical component of creating a robust research ecosystem on campus (Ajjawi et al., 2018). This involves defining the university's research priorities, goals, and objectives, and aligning them with its mission and vision. A clear research strategy can help universities to focus their resources and efforts on areas where they have a competitive advantage and can make the most significant impact. To establish a clear research strategy, universities should conduct a thorough analysis of their strengths, weaknesses, opportunities, and threats (SWOT) to determine where they can add the most value. Based on this input, universities can develop a strategic research plan that outlines their research priorities, goals, and objectives, as well as the resources and infrastructure needed to achieve them.

Establish a Research Office

The first step to creating a research ecosystem on campus is to establish a research office. This office will serve as a hub for all research-related activities on campus, including funding, proposal development, and coordination of research projects (Kirkland, 2005). The research office can also serve as a resource for faculty and students who need assistance with research-related tasks.

Provide Access to Research Infrastructure

Institutions must provide adequate resources and support for researchers to carry out their work. Research infrastructure such as laboratories, equipment, and library resources are essential for conducting high-quality research. The university can provide access to research infrastructure by establishing shared facilities, providing funding for equipment and software, and maintaining up-to-date technology and equipment.

Establishing Research Groups or Centres

Establishing research groups or centres is a critical component of building a strong research culture at universities (Kumar, 2017; Vabø et al., 2016). By providing a designated space for researchers to collaborate and conduct research, these groups and centres can promote innovation and facilitate interdisciplinary collaboration. Research groups or centres can bring together faculty members and students from various disciplines who share a common research interest, creating a supportive environment for the exchange of ideas and knowledge. They can also provide access to specialized equipment and resources that may be too expensive or impractical for departments to acquire. Furthermore, research groups or centres can attract external funding and collaborations with other institutions or industry partners, resulting in greater visibility and impact for the university. They can also serve as a platform for outreach and engagement with the wider community, by organizing workshops, seminars, and other public events that showcase research findings and their relevance to society.

Intellectual Property Rights (IPR)

Universities should motivate faculty and students to file patents, as it can lead to increased innovation and commercialization of research. Establishing an IPR cell in universities is important to meet the needs of the academic community and promote a research ecosystem. The IPR cell provides a platform for researchers to understand and manage their intellectual property rights, ensuring that their inventions are protected from unauthorized use or infringement. In addition, the IPR cell can help researchers identify opportunities for licensing and commercialization of their intellectual property, which can generate income for the university and the researchers.

Establish a Research-Based Curriculum

The university can establish a research-based curriculum that integrates research activities into courses and programs. This can provide opportunities for students to engage in research activities early in their academic careers and develop research skills that can benefit them in their future careers (Pai & Chiplunkar, 2017). The universities should also develop interdisciplinary research programs that encourage collaboration between faculties and students from different departments and fields of study.

Develop a Supportive Research Culture

A supportive research culture is essential for encouraging research excellence (Khoo, 2021; *Middlesex University*, n.d.). This can be achieved by creating a supportive and inclusive environment where researchers feel valued, respected, and supported. Academic institutions should provide faculty members the opportunities for professional development and training. Institutions must recognize and reward research excellence through incentives such as promotion, research awards, and funding for outstanding research. This sends a clear message that research is valued and encourages researchers to strive for excellence. Mentorship, support and seed funding for early-career

researchers can help them develop the necessary skills and establish their research careers. Universities can also assign senior researchers or faculty members as mentors to guide and support early-career researchers.

Promoting Undergraduate Research Opportunities

Promoting undergraduate research opportunities at universities is an essential aspect of developing a research culture (Linn et al., 2015). Undergraduate research opportunities enable students to gain valuable experience in conducting research, applying critical thinking skills, and applying theoretical concepts to real-world problems (Halaby, 2001). These opportunities can be in the form of research projects, research assistantships, or collaborative projects with faculty members. Undergraduate research opportunities also promote mentorship relationships between students and faculty, which can have a positive impact on student success. This type of hands-on experience prepares students for future careers in research or graduate studies and provides a unique opportunity to develop skills that are not typically acquired in traditional classroom settings.

Support Entrepreneurship and Commercialization

Research can lead to new products, processes, and services that have commercial potential. The university should support entrepreneurship and commercialization by providing resources, training, and mentorship for faculty and students who want to start their own companies or commercialize their research (Arroyo-Vázquez et al., 2010; Phillips et al., 2018). Universities should also consider establishing an incubation cell on their campus which can serve as a platform for aspiring entrepreneurs, providing them with a supportive environment to develop and grow their ideas into successful ventures.

Foster Collaboration and Interdisciplinary Research

Institutions should encourage interdisciplinary research, which can lead to more innovative and impactful research outcomes. (White & Deevy, 2020). This can be achieved through joint research projects, interdisciplinary courses, and seminars that bring together faculty and students from different disciplines. Promoting research collaborations is also essential for universities to foster innovation and advance knowledge (Bozeman et al., 2013; Chen et al., 2020). Collaborating with researchers and institutions from different countries can help universities gain access to new resources, knowledge, and expertise. It can also help in expanding the scope of research and increase its impact globally. Collaboration with industry and government can provide valuable opportunities for research and development (Abbas et al., 2019; Ankrah & Omar, 2015). The university should establish partnerships with local industries and government agencies to identify research needs and opportunities. This can lead to joint research projects, internships, and employment opportunities for faculty and students.

Encourage Community Engagement

Research can have a positive impact on the local community. The university should encourage community engagement by conducting research that addresses community needs and issues (Mbah, 2019; Weerts & Sandmann, 2008). The university can establish partnerships with local organizations, government agencies, and community groups to identify research needs and opportunities.

Research Grants

Securing funding for research projects and equipment is essential for advancing knowledge and conducting impactful research. Faculty members should actively submit grant proposals to funding agencies that align with their research interests. This requires identifying funding opportunities, preparing strong proposals, and submitting them within the given timeline. Institutions can share lists of active grant calls with faculty members to help them identify relevant funding opportunities. Senior faculty members can provide guidance and mentorship to young researchers in preparing grant proposals. Faculty members can also collaborate with other researchers and institutions to increase the chances of securing funding. Many funding agencies encourage collaborative research projects, and working with other researchers can provide additional resources and expertise.

Quality Assurance in Research

Engaging in high-quality research is a crucial aspect of advancing knowledge and contributing to the academic community. To achieve this, it is important to stay up to date with the latest developments in your field, collaborate with other researchers, and prioritize innovation. One effective way to ensure the impact of research is to publish articles in journals with a high Impact Factor or Cite Score. These journals typically

have a wider readership and higher prestige, increasing the visibility of your research and the likelihood of it being cited by other researchers. Choosing the right journal for publication is a crucial decision for any researcher (Suiter & Sarli, 2019). It's crucial to avoid publishing in predatory journals as they are known for their unethical practices, including lack of peer review, low-quality publishing standards, and questionable editorial practices (Elmore & Weston, 2020). Look for journals indexed in popular databases like Scopus and Web of Science. Ensure the journal has a rigorous peer review system. This ensures that your research is reviewed by experts in the field and can provide constructive feedback to improve the quality of your research. It is also essential to consider the publication frequency of a journal before submitting an article to it. Journals can have different publication frequencies, ranging from monthly, bi-monthly, quarterly, to annual publications. Journals that publish more frequently may be more attractive but may also have a lower impact factor. Consider publishing articles in journals with open-access options, which ensures that your research is accessible to a wider audience, even if they do not have institutional access to the journal.

Establishing a Research Ethics Committee

Establishing a research ethics committee in universities is an essential step toward ensuring that research conducted by faculty, staff, and students adheres to ethical principles and guidelines (McAreavey & Muir, 2011). A research ethics committee is a group of individuals who are responsible for reviewing and approving research proposals to ensure that they meet ethical standards and do not harm the participants or violate their rights. The committee should review all research proposals before they are approved, and provide guidance and support to researchers on ethical issues.

Communicating Research Findings to the Wider Community

Communicating research findings to the wider community involves disseminating research findings in a way that is accessible and understandable to the general public. This can be achieved through various channels, such as academic publications, conference presentations, popular media outlets, and social media (Ross-Hellauer et al., 2020). Effective communication of research findings can help to increase public awareness of the importance of research and its impact on society. It can also help to promote collaboration among researchers, policymakers, and other stakeholders.

Monitoring and Evaluating the Research Ecosystem

Monitoring and evaluating the research ecosystem involves assessing the impact of research on society and identifying areas for improvement. This can be achieved through various methods, such as surveys, focus groups, and data analysis. Monitoring and evaluation can help institutions to identify the strengths and weaknesses of their research programs and to develop strategies for improvement. It can also help to identify areas where research is having a significant impact and to promote further investment in those areas.

Conclusion

In conclusion, creating a robust research ecosystem on campus is crucial for universities to maintain their competitive edge, attract top talent, and make significant contributions to society. To achieve this goal, universities should adopt a holistic approach that involves implementing strategies that support research excellence, encourage collaboration and interdisciplinary research, and promote knowledge dissemination and translation. Universities need to recognize the value of research and should prioritize creating an environment that supports it. Creating a robust research ecosystem requires a sustained commitment from university leadership, faculty, and staff. It is not a one-time effort but rather an ongoing process that requires continuous improvement, feedback, and evaluation. By staying focused on the long-term vision, universities can build a research ecosystem that is resilient, adaptable, and responsive to emerging challenges and opportunities.

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Significance of National and International Collaborations for Boosting Research

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National and International Collaborations are the only ways in boosting research. In today's world where the economies are converging and being connected with each other like never before, collaborations hold a true promise in making research successful, quality oriented and raising the impact of the research publications. Various highly collaborative projects like the CERN projects have seen huge success because of group effort and exceptional thinking methodologies developed while working on those projects. Hence, its truly necessary that quality collaboration must be in place to enhance quality research.

Research is a domain that requires extensive patience and high-level academic brilliance. Hence, it's always better to conduct research in teams and collaborations form an integral part of the research. Scientific research requires critical thinking and innovative technologies which can be solved through a team of experts rather than an individual. Therefore, collaborations are highly essential to make research successful and impactful. The following collaboration models are generally in practice:

- **Voluntary Collaboration**- This type of collaboration happens when members voluntarily collaborate for their common goals and work together to understand the ideas and challenges of a particular research project.
- **Consortia**- This type of collaboration is formed when individuals or research organizations come together to address some critical and challenging problems which are characterized through a structured model and is formal in type. This type of collaboration has a joint research fund and sometimes has also access to external funding agencies.
- **Federation**- These types of collaborations are formed in case of bigger projects which require a higher level of expertise, and understanding and involve a lot of many domains with domain-specific knowledge. These types of collaborations have two or more groups operating under single governance. They are more structured and formal in nature and have a set of protocols under which these groups operate. These types of collaborations are more projects specific but the continuity depends on the perennial flow of commercially viable projects.
- **Affiliations-** This format of collaboration is more definite and attempts to attract the best talent and expertise. This format also works on a diverse range of research projects and has its own research data-sometimes both primary and secondary to support quality research. In this model of collaborations organizations and individuals become accredited or members of any reputed research brand which gives them all the support to conduct research including infrastructure, funding, and resources.
- **Merger**- This is a format that entertains the merging of various disciplines and experts from various domains join hands including various research organizations and Affiliates which take up challenging and innovative research subjects. These types of formats are much bigger in structure and are present across continents which also takes into account the diversity and recent academic accomplishments of the world.

Collaboration takes place for the following reasons:

- Better exchange of ideas
- Learning new skills
- State-of-the-art infrastructure
- Access to resources in terms of talent and expertise
- Understanding concepts which have multi-dimensional aspects
- Understanding effective communication methods
- Developing new partnerships
- Creating equal opportunities among team members

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- Creating respect for each one's organization and leadership style
- Learning to multi-task
- Developing multicultural ethics, transparency, and academic integrity

Collaborations can be at the national level with various organizations within the country and can also be at the international level with leading research organizations of the planet. The collaborations can be intra-disciplinary, inter-disciplinary, multi-disciplinary, trans-disciplinary, or anti-disciplinary. The anti-disciplinary research collaboration is relatively new and involves two or more disciplines that are not connected to each other. This type of research takes into account relatively new subjects of study and used unconventional methods to solve the problem. It pushes the creative learning spirit and makes the research scholars hyper-specialized in various domains. These anti-disciplinary research projects find difficulty finding collaboration because these are relatively new subjects that do not fit into traditional research methodologies. This type of research project tends to have a high impact and focuses on innovative thinking.

Now collaboration is the core of research and enhances the high impact on publications. The high impact factor endorses credibility as well as the citation index. All these citations provide a quantitative measurement of the relative strength of the journal and are adopted by various tenure committees and funding agencies. National and international collaborations essentially help in raising this impact factor.

Collaboration helps in dividing work, especially in big projects thereby improving the time and quality of work. This helps in completing projects on time and understanding various technologies and crisis management strategies.

The most important rationale for collaboration is getting truly judged. National & International collaborations help to analyze a project from different angles and each perspective has a unique thinking approach. Thus, the project has the opportunity to be tested and verified from different angles before it is finally published making it more quality oriented.

Collaboration brings distributive intelligence to the group which helps to raise the standard of the research. Hence the team becomes more mature and each member brings in a better experience and develops a probability of solving problems in a better way. Thus, researchers develop a broad spectrum of techniques and methodologies. Scientific techniques also find a new dimension with updated lab facilities as well as resources.

The importance of collaboration helps to find new funding alternatives. Hence a proper collaboration can help researchers to arrange funding from various international funding agencies and if collaborative efforts are on the right track, the funding mechanism can be permanent for the researchers.

Collaboration helps to build up huge networking which can be utilized in various ways in research. Today every research is endorsed by peers and a proper network can work wonders in research and the way it is undertaken. Hence, collaborations both at the national and international levels give a huge mileage to research.

Collaborations promote agility, thereby making the researchers work smart and address unexpected variables very quickly. This reduces project delays and enhances the efficiency of the researcher.

Collaborations and joint ventures help in innovations and thereby increase the chances of patents. Generally, collaborative efficiencies create a huge platform for entrepreneurial research. These researches are backed by a commercial viability matrix which in turn increases the chances of getting more patents.

The best benefit of collaborations is the early adopters of the technology. The collaborative partners adopt the technology and commercialize the idea thereby increasing the chances of making researchers popular for their novel approach, hypothesis, and new thinking. It creates recognition for the researchers on an international scale and thereby this recognition works to bring more funds and research projects. Thus, this creates a permanent impression of the researcher's ability, academic brilliance, and strong conceptual clarity.

However, in India, there are some personal prejudices that work to create hurdles in collaborative efforts along with institutional approaches. These

(contd. on pg122)

Internationalization of Higher Education to Regain Past Glory of India

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Internationalization is the process of introducing foreign participants to higher education's administrative, instructional, and research functions. In order to adapt to the international academic environment, academic systems, institutions, and even people engage in a variety of policies and practices known as internationalization. Commercial gain, knowledge and language development, as well as the addition of international content to the curriculum, are a few of the reasons for internationalization. The term "internationalization" is typically used to refer to specific initiatives like branch campuses, cross-border collaboration relationships, and programmes for international students (Leask, 2020).

Globalization and internationalization are connected but distinct processes. While internationalization requires decisions at the human, institutional, and macroeconomic levels, globalization is a phenomenon that is mostly unavoidable. Given that the "movement of people and information" is included in the most general definition of globalization, it is accurate to say that the internationalization of higher education contributes to globalization and, as a result, influences economic and academic trends (Larsen, 2016).

To the common man, globalization altogether appears to be a new concept that is a few years old but then an important question arises -Is it really a new idea? India boasts of a long history of the global interface in the educational sector. The ancient Indian universities: Nalanda and Takshashila were truly international hubs and could attract students from different countries. The great Hindu Spiritual Leader Swami Vivekananda also advocated for the incorporation of the best educational practices across different geographies. The idea of globalization is, however, being included in the sphere of education in the modern world with enhanced digital technologies and soft skills. Globalization was sparked by the political choice made by many countries to liberalize and open up their economies to the outside world. This trend was accelerated by the development of information and communication technology (ICT), which guarantees a constant flow of communication (Waller, *et al.*, 2021).

Indians have steadily but gradually climbed corporate ladders around the world over the years, and they have also made substantial contributions to the expansion of many of the world's technological powerhouses. From Microsoft to Pepsi and Google to the Master cards in our hands that we use for shopping, Indians have played a vital role in the invention and marketing management of these life-changing businesses. 30 per cent of Fortune 500 corporations are headed by Indian CEOs. The brain pool, however, generally speaking, no longer belongs to India. What causes them to do this? There may be other reasons, however, the following three major advantages stand out: the educational system, the business climate and the labour market, and the conveniences and way of life. Education is the primary factor driving students' initial desire to study abroad. Lucrative salaries and comfortable lifestyles also are the reasons. However, the internationalisation of higher education is dynamic and is impacted by many national and global perspectives.

During the colonial era, the British rulers founded colleges and universities in India that were styled after British universities. These universities and colleges extensively relied on other nations (mostly the UK) to hire foreign professors, train Indians to be teachers and researchers, obtain laboratory facilities and equipment, etc. After attaining independence, India adopted a planning framework for systematic growth and development. In order to specify the path of development and progress, five-year plans were created. Internationalization took the shape of a cross-border flow of students, professors, and financial flows to build new higher education institutions. IITs and IIMs attracted faculty members, experts, and significant financial support from industrialized nations (US, USSR, and numerous European countries) in a non-alignment political

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climate during their early years. Although in the early post-colonial years, the political commitment to technologically independent economic and industrial development was mirrored in the internationalization of higher education, India lacked a long-term strategy for such internationalization. In the first two National Education Policies--1968 and 1986, the internationalization of education was not seen as a crucial issue or a top priority.

It was only during the formulation of the 10th Five-Year Plan (2001-06) with its deliberate and strategic incorporation of policies on the internationalization of higher education that saw a paradigm shift in the globalization of higher education. Focusing on the movement of students across international borders, the University Grants Commission (UGC) explained why internationalization was necessary. Collaborations for teaching and research were proposed in the UGC's 12th five-year Plan (2012–17), which also contained plans for faculty and student exchange programmes. However, a lot of these attempts were unsuccessful because they lacked strong political backing, clear administrative guidance, and financial support.

As of now, India houses over thousand and fifty universities, with a broad breakup of 55 central universities, 416 state universities, 125 deemed universities, 361 private universities, and 159 Institutes of National Importance, which include, among others, AIIMS, IIMs, IITs, IISERs, IIITs, and NITs (MHD Dashboard). Even though India has the second-largest higher education system in the world, none of its universities or colleges ranks among the top 100 in the world. India has one of the largest labour pools, yet the level of that labour raises questions. Subpar colleges produce unprofessional graduates who are degree-focused. The nation is ranked 37 out of 132 nations in the most recent Global Talent Competitive Index (2022), which assesses a nation's capacity to develop and draw talent (INSEAD, 2022). Only six universities rank among the top 500 in the globe, despite being home to some of the best academics in the world. Additionally, the Gross Enrolment Ratio, which measures the proportion of students enrolled in higher education to all other people in that age bracket, stands at 26%. Comparatively speaking, only 26% of eligible Indians enroll in higher education, compared to 99% in Italy, 90% in Australia, and 85% in the US.

National Education Policy –2020: A Game Changer

The biggest game-changer which has come to change the dismal state of affairs of Indian higher education is the long-awaited New Education Policy that was adopted by the Union Cabinet on July 29, 2020. The NEP--2020 made a strong recommendation to move towards a more liberal, comprehensive, and homegrown higher education system. It aspires to implement radical improvements in the classroom and higher education systems and enhance India's position as a world power.

This enormous initiative of launching NEP--2020 is all the more promising given the areas that demand change and the steps that must be taken to accomplish them with the enormous size and complexity of India's higher education industry. NEP--2020 aims to internationalize Indian institutions in several ways, with a focus on both domestic and foreign students. Also, the project seeks to address some of the ongoing problems with educational reforms that are a hindrance to India's efforts to internationalize higher education. With the help of a new legislative framework, the strategy promotes Indian universities to establish satellite campuses abroad and permits international universities to operate in India, all of which benefit domestic students.

Through a number of government initiatives and programmes like GIAN, SPARC, Study in India, etc. among others, the government now has been actively promoting reforms to advance internationalization in higher education. Profit-making or commercial interests do not drive the internationalization of higher education in India. Instead, the government views it as a way to strengthen diplomatic ties and soft power with other nations while also elevating India's standing in the world university rankings (Chakraborty, 2021).

In order to draw in foreign students, the NEP--2020 offers affordable, high-quality education, streamlines visa and internship procedures, provides funding to Indian universities to create programmes specifically for foreign students, and promotes international research collaborations and agreements for the mutual recognition of degrees. Support for short-term programmes and memorandums of understanding (MOUs) with other governments

are two more noteworthy steps taken by the Indian government to attract more overseas students. The government is making an effort to focus on recruiting more students from a number of nations under its Study in India initiative. More than 2,000 students can receive grants of $3,500 each year through Study in India, which was started in 2018.

To accomplish these goals, the government has already taken a number of decisive actions, such as giving Institutes of Eminence ("IoE") the freedom to freely collaborate with specific categories of foreign institutions without the need for regulatory approval, hiring foreign faculty, etc., or by promoting discussions that would enable the top 100 universities in the world to open campuses in India. Additionally, the regulations now in place on partnership agreements between Indian higher education institutions and their international counterparts clearly outline the requirements for participating institutions. Through the recently released guidelines on the internationalization of higher education (referred to as the "IHE Guidelines"), the government has given such cooperative agreements between Indian and foreign HEIs an additional push.

UGC's IHE Guidelines provide an opportunity for global outreach of Indian HEIs. They encourage Indian HEIs to undertake strategic reforms aimed at (i) forming twinning arrangements with foreign HEIs for offering various programmes; (ii) enabling credit transfers between Indian and foreign HEIs; (iii) aligning the curriculum, faculty and infrastructure of Indian HEIs with global standards; (iv) adopting a global citizenship approach; and (v) enhancing technological capabilities and undertaking newer forms of programmes such as Massive Open Online Courses (MOOCs). In essence, the IHE Guidelines offer a huge potential for structuring arrangements between foreign HEIs and educational platforms and their Indian counterparts. By mandating participating Indian institutions to have an Office for International Affairs (OIA) that is in charge of carrying out collaboration activities, as the UGC has already advised Indian universities in a separate decree from January 2021, the regulations may make it simpler for foreign institutions to establish a presence in India.

In essence, UGC's IHE Guidelines are advisory in nature and encourage HEIs in India to follow their recommendations. While the IHE Guidelines' main goals are to improve Indian education standards and equip students with useful skills (Creativity, Problem-solving, Collaboration, Information literacy, Digital &Media literacy, Civic literacy, Social responsibility, Innovation skills, etc.), the contribution of foreign HEIs to the internationalization of higher education has been explicitly acknowledged and supported. Additionally, it is anticipated that internationalization will enable Indian HEIs to expand their global reach. This will lead to the development of HEIs with a global standard and high global rankings as well as capacity building, economic growth, and access to high-quality education.

Efforts of Internationalisation at North Eastern Hill University

Many distinct groups and tribes coexist in India's north-eastern area. Some of them include Assamese, Bodo, Khasi, Mizo, Naga, Singpho, Kuki, Mishing, Rabha, Adi, Apatani, Garo, Deori, Nishi, Rengma, and Angami. Each tribe here has enduring traditions, a thriving traditional culture, and distinctive lifestyles. The globalization trend creates new opportunities for the North East region to learn about the contemporary lifestyles of highly developed countries in other parts of the world. Spreading knowledge, exchanging ideas, and imitating other cultures are some beneficial results of this integration that broaden people's perspectives and make things easier to accept.

The literacy rate in many of these states is above the rest of the country. It is needless to mention that quality higher education and its internationalization is pre-requisite for the creation and development of skilled human resources. To pay special attention to the improvement of the social and economic conditions and welfare of the hilly peasants of the North-eastern region, and in particular, the intellectual, academic and cultural advancement, North-Eastern Hill University (NEHU) was founded on July 19, 1973, by a law passed by the Indian Parliament. The institution is located in a Shillong neighbourhood, the state capital of India's Meghalaya.

The geopolitical location of NEHU, Shillong makes it an ideal research hub to support and augment the 'Look East Policy' of the Government of India for

promoting economic, strategic and cultural relations with the vast Asia-Pacific region. Recently the Office of International Affairs (OIA) is established at NEHU to look after all international academic relations with partnering Governments, Institutions, and other relevant bodies. The OIA serves as the university's single-window facilitation office for all issues involving international cooperation. The signing of MoUs on potential collaborations in a wide range of areas touching upon research and academic exchange in the fields of space, energy, quantum computation, literature, language, and social sciences are just a few of the encouraging developments in the University. Other noteworthy developments include Indo-US collaboration under an AICTE scheme, students exchange programmes to Japan under 'IRIS', a youth invitation scheme of the Japanese government and visits by several ambassadors from different countries to the university. A plan for collaboration with Erasmus is currently in progress. We are highly hopeful of positive results in times to come through these international collaborations.

NEHU has also come up with the newly created 'Centre for Creativity and Internationalization of Higher Education (CCIHE)'. This Centre is in the process of housing skill-based developmental activities like Activation of Incubation and Bio-Nest Cells, Research and Development Cell, Design Innovation Centre, Biodiversity Informatics Centre, IPR Cell, OIA, MOOCs Lecture recording Studio and Smart/Digital Classrooms etc. for overall holistic growth of the University.

Conclusion

Indians are well-known throughout the world as top academics and scientists, administrators at universities, and prominent figures in high technology, yet little is known about the academic environment from which they have arisen. India's academic system is now the world's second-largest. And, as articulated in the National Education Policy-2020, the country is actively pursuing reform and improvement. The present government has shown, particularly at the higher education level, that it is eager to put NEP's vision into practice not merely through rhetoric but also through actual regulatory acts by which India will be promoted as a global destination providing premium education at affordable costs to help restore its status as *Vishwa Guru*. It is now time for India to become a prominent player in the global academic community as it takes over the G20 presidency.

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Creating a Gateway to Global Opportunities: The Importance of an Office of Global Affairs in Comprehensive Universities

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In today's interconnected world, the Internationalization of higher education has become increasingly important. It refers to integrating global perspectives, experiences, and learning opportunities into the curriculum and research of higher education institutions. Internationalization benefits for universities include enhanced reputation, increased funding opportunities, improved research collaborations, and more diverse student bodies. Furthermore, Internationalization can help students become global citizens equipped to succeed in a globalized workforce. Despite the potential benefits, many universities still do not prioritize Internationalization, leading to missed opportunities and challenges in the ever-evolving global landscape. In this paper, we explore the Internationalization of higher education and argue for creating an international affairs office in comprehensive universities. Specifically, we will examine how universities can leverage Internationalization, the importance of Internationalization for students, the roadblocks to Internationalization, and the necessity of a dedicated global affairs office.

What is the Internationalization of Higher Education?

Internationalization of higher education refers to integrating global perspectives, experiences, and learning opportunities into the curriculum and research of higher education institutions. This includes various activities, such as international student and faculty exchanges, study abroad programs, global research collaborations, and integrating global issues into the curriculum. Internationalization aims to provide students with a comprehensive, international education that prepares them for success in a diverse and interconnected world.

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How do Universities Globally Leverage the Benefit of the Internationalization of Higher Education?

Internationalization offers universities many potential benefits, including enhanced reputation, increased funding opportunities, improved research collaborations, and more diverse student bodies. By attracting international students and faculty, universities can create a more diverse and inclusive environment that fosters cultural exchange and understanding. Furthermore, global research collaborations can bring discoveries and innovations that benefit society. Finally, Internationalization can help universities attract funding from international sources, including governments, foundations, and corporations.

Why should Universities not Ignore the Internationalization of Higher Education?

Ignoring Internationalization means missing out on the many potential benefits it can offer universities, including enhanced reputation, increased funding opportunities, improved research collaborations, and more diverse student bodies. Additionally, it is becoming increasingly important for students to have a global perspective and cross-cultural competencies in today's interconnected world. By ignoring Internationalization, universities risk leaving their students unprepared for a globalized workforce and missing out on opportunities to contribute to global problem-solving efforts.

How Can Internationalization Help the Student to be a Global Citizen?

Internationalization can help students become global citizens by providing a comprehensive and international education that prepares them for success in a diverse and interconnected world. Students can develop cross-cultural competencies and better understand global issues through study abroad programs, international student and faculty exchanges, and integrating global issues into the curriculum. Additionally, by working with international peers

and faculty, students can build global networks that benefit them throughout their careers.

What are the Roadblocks to the Internationalization of Higher Education?

Despite the potential benefits, several roadblocks to Internationalization in higher education exist. These include limited funding, lack of institutional support, language barriers, visa restrictions, and cultural differences. Furthermore, some universities may hesitate to pursue Internationalization due to concerns about quality control and academic standards.

What is the Necessity of an Entire Office of Global Affairs in the Universities?

To overcome the roadblocks to Internationalization and fully leverage its potential benefits, universities should consider creating a dedicated office of global affairs. This office can be a central hub for international activities, including study abroad programs, international student and faculty exchanges, and global research collaborations. Additionally, the office can support international students and faculty, including assistance with visa applications and cultural adjustment. By centralizing these activities, universities can ensure they are adequately supported and coordinated, leading to more effective and efficient internationalization efforts.

The importance of a dedicated global affairs office cannot be overstated. Without a centralized office, internationalization efforts may be scattered across various departments and programs, leading to duplication of efforts and potential gaps in coordination. Furthermore, a global affairs office can provide a unified voice for the university in international collaborations and partnerships, enhancing the university's reputation and visibility on the worldwide stage.

In addition, a global affairs office can help universities navigate the complex regulatory and legal frameworks associated with internationalization efforts. This includes managing visa applications, ensuring compliance with local laws and regulations, and providing guidance on ethical considerations in international research collaborations. By having a dedicated office to handle these tasks, universities can ensure that they are operating honestly and legally while maximizing the benefits of Internationalization.

Finally, a global affairs office can help universities foster a culture of Internationalization throughout the institution. The office can help faculty and staff incorporate international perspectives into their teaching and research by promoting worldwide awareness and understanding, leading to a more comprehensive and globally relevant curriculum. Additionally, the office can provide opportunities for students to engage with international peers and faculty, leading to a more diverse and inclusive campus community.

In conclusion, the current Indian Education Policy NEP--2020's suggestion for a dedicated global affairs office is essential for comprehensive universities to leverage Internationalization's benefits fully. By providing centralized support for international activities, navigating complex regulatory frameworks, and fostering a culture of Internationalization, a global affairs office can help universities become more globally competitive, attract funding from international sources, and produce graduates who are better prepared to succeed in a diverse and interconnected world.

Establishing an Office of Global Affairs

Establishing an Office of Global Affairs within a comprehensive university is a significant undertaking that requires careful planning, coordination, and execution. The following roadmap outlines the critical steps involved in establishing such an office:

Define the Goals and Objectives of the Office of Global Affairs

Before establishing the office, it is crucial to define the goals and objectives that the office aims to achieve. This can be done by identifying the needs of the university, the current international engagement activities, and the opportunities for growth and expansion. Potential objectives could include

- increasing international student enrolment,
- expanding student study abroad opportunities,
- developing research collaborations with international partners, and
- promoting the university's reputation as a global institution.

Identify the Necessary Resources

Establishing an Office of Global Affairs requires a significant investment of resources. Identifying the essential resources, including personnel, funding, and infrastructure. This may involve hiring staff members, securing funding from the university or external sources, and providing the office with a physical location and necessary technology.

Develop a Strategic Plan

A strategic plan should guide the Office of Global Affairs' activities. The plan should outline the goals and objectives of the office, as well as the strategies and tactics that will be used to achieve them. The plan should be reviewed regularly to ensure that it remains relevant and effective.

Establish Partnerships

The Office of Global Affairs should partner with other institutions, organizations, and businesses to facilitate international engagement activities. These partnerships can be with other universities, government agencies, non-governmental organizations, and businesses interested in global engagement.

Develop Programs and Initiatives

The Office of Global Affairs should develop programs and initiatives that support the goals and objectives of the office. These may include study abroad programs, international student services, faculty exchange programs, research collaborations, and outreach activities.

Foster a Culture of Global Engagement

The Office of Global Affairs should work to foster a culture of global engagement within the university. This can be done by promoting international awareness and understanding, encouraging faculty and students to engage in international activities, and recognizing and celebrating international achievements.

Evaluate the Effectiveness of the Office

The Office of Global Affairs should regularly evaluate the effectiveness of its programs and initiatives. This can be done by assessing the impact of the office on the university's international engagement activities, measuring the success of specific programs and ambitions, and soliciting feedback from faculty, staff, and students.

By following this roadmap, a comprehensive university can establish an effective Office of Global Affairs that supports international engagement activities and promotes the university's reputation as a global institution.

Typical Functions of the Office of Global Affairs

The Office of Global Affairs (OGA) is critical in promoting Internationalization and expanding the university's global reach. Its functions, which include facilitating academic collaborations, study abroad programs, international student services, curriculum internationalization, funding opportunities, cultural events, and alum relations, are essential in promoting diversity, inclusivity, and academic excellence. The OGA's significance in promoting cross-cultural understanding and preparing students to become global citizens cannot be overstated as the world becomes increasingly interconnected. Some of the important responsibilities are discussed here.

International Collaborations

The OGA is responsible for identifying and building relationships with institutions and universities abroad for academic collaborations. It plays a crucial role in promoting research collaborations, faculty exchange programs, student exchange programs, joint degree programs, short-term courses, and study abroad programs. The OGA's ability to establish and maintain strong relationships with international partners is fundamental in creating and sustaining academic opportunities for students, faculty, and staff.

Study Abroad Programmes

The OGA facilitates the exchange of students and faculty with partner universities abroad through study-abroad programs. These programs allow students to experience diverse cultures, learn new languages, and gain a global perspective. Study abroad programs also enable faculty to collaborate with international colleagues, conduct research, and teach in different academic settings.

International Student Services

International students face numerous challenges when studying abroad, including obtaining visas and immigration documents, finding accommodation,

accessing healthcare, and adapting to new cultural environments. The OGA assists international students with these challenges by offering support and guidance through orientation programs, cultural events, and other services. The OGA's efforts in ensuring international students' welfare are essential in promoting their academic success and overall well-being.

Internationalization of Curriculum

The OGA works closely with academic departments to internationalize the curriculum by incorporating global perspectives into courses, developing international case studies, and integrating international experiences into the curriculum. The OGA's role in promoting the Internationalization of the curriculum is crucial in preparing students to become global citizens and in promoting cross-cultural understanding.

Funding Opportunities

The OGA provides information on funding opportunities for research, conferences, and other academic activities through its network of international partners. The OGA's ability to connect researchers and scholars with funding opportunities is crucial in advancing the institution's research agenda and promoting academic excellence.

Cultural Events and Activities

The OGA organizes cultural events and activities to promote cultural exchange and understanding among students and faculty from different countries. These events provide a platform for students to showcase their cultures, learn about other cultures, and promote cross-cultural dialogue. The OGA's efforts in promoting cultural exchange are essential in promoting diversity and inclusivity on campus.

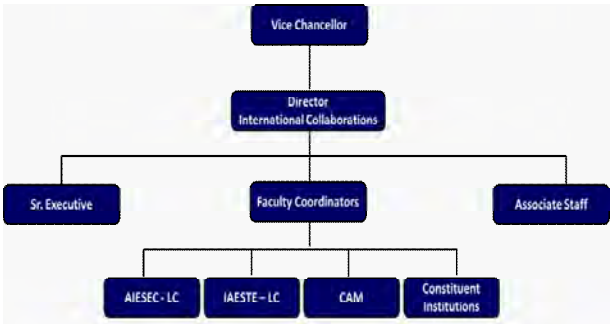
Alumni Relations

The OGA maintains relations with the university's international alums to promote networking opportunities and update them on university developments and events. The OGA's role in keeping alum relations is crucial in promoting the institution's global reach and building a robust international alum network.

Case Study: Office of International Affairs and Collaborations at Manipal Academy of Higher Education

Manipal Academy of Higher Education (MAHE) has an Office of International Affairs and Collaborations (OIAC) that facilitates collaborations between MAHE and universities/institutions abroad and the Internationalization of MAHE's academic programmes.

Fig: Structure of the Office



Vice Chancellor

- Provides the overall guidance and oversees the activities of the office
- Is the designated signatory for MoUs for a university-wide agreement
- Advises the Office of International Affairs and Collaborations
- Strategizes the matters related to the Internationalization of Manipal

Director, International Collaborations

- Head of the Central Office of International Affairs and Collaborations (OIAC)
- Liaises with the Heads of the Institutions through the nominated Faculty Coordinators
- Has the responsibility of fulfilling the objectives of OIAC
- Seeks relationships with potential partners and identifies possible areas of collaboration

Faculty Coordinators

- Ensures that the objectives of the institutes are in alignment with the OIAC objectives
- Provides a quarterly update to the Central Office during Manipal International Coordinators Review and Outcome (MICRO) Meeting

- Facilitates international student internships through IAESTE, AIESEC, IPSF etc.

Senior Executives

- Oversees the administrative matters related to the OIAC
- Manages the data of the International Office and schedules the meetings with partners

Associate Staff

- Deals with outbound student mobility
- Deals with inbound student exchanges and foreign student registration formalities
- Vetting of the new MoAs and renewal of existing MoUs
- Manages the guests and visitors from international universities

AISEC in MAHE

AIESEC is a global youth-led organization that aims to develop leadership potential in young people through experiential learning, volunteer experiences, and professional internships. AIESEC operates in more than 120 countries and territories around the world.

AIESEC in MAHE, or AIESEC in Manipal Academy of Higher Education, is the local chapter of AIESEC in Manipal, India. As a part of the AIESEC global network, AIESEC in MAHE aims to provide leadership development opportunities for young people, create cross-cultural exchange experiences, and facilitate international internships for students and recent graduates.

AIESEC in MAHE offers a variety of programmes, including:

- ***Global Volunteer***: This program allows individuals to volunteer in a foreign country and work on projects related to social issues such as education, environment, and health.
- ***Global Talent***: This program provides international internships for students and recent graduates in various fields, such as marketing, engineering, and finance.
- ***Youth Leadership Development***: AIESEC in MAHE also offers leadership development programs for young people to enhance their leadership skills and personal growth.

AIESEC in MAHE is a platform for young people to develop their leadership potential, gain international experience, and contribute to global issues.

IAESTE LC MAHE

IAESTE LC Manipal is the local chapter of the International Association for the Exchange of Students for Technical Experience (IAESTE) in Manipal, India. IAESTE is a global organization that provides students in science, engineering, and technology with internships abroad, allowing them to gain practical experience in their field of study and experience a new culture.

IAESTE LC Manipal aims to provide opportunities for students to gain international experience through internships in companies and research institutions worldwide. The chapter promotes cultural exchange and international understanding and encourages students to develop skills and knowledge through practical work experience.

IAESTE LC Manipal operates under the guidance of the national committee of IAESTE India and is managed by a team of students elected to leadership positions annually. The chapter collaborates with IAESTE offices in other countries to provide internships to its members and to host students from other countries who come to India for internships.

IAESTE LC Manipal offers a variety of programs and events, including:

- ***Internship Exchange***: IAESTE LC Manipal facilitates internships abroad for its members, allowing them to gain valuable work experience in their field of study.
- ***Cultural Exchange***: The chapter organizes cultural events and activities to promote international understanding and cultural exchange among its members and the wider community.
- ***Professional Development***: IAESTE LC Manipal provides training and workshops to help students develop their professional skills and prepare for their careers.

Overall, IAESTE LC Manipal provides students with a valuable opportunity to gain international experience, develop their skills, and broaden their

perspectives through practical work experience and cultural exchange.

Campus Ambassador Programme of MAHE

MAHE's Campus Ambassador programme is a fantastic opportunity for students to showcase their leadership and communication skills while promoting MAHE's programs and services. The program encourages students from different institutions and departments across the university to apply and become a part of the MAHE community.

The Campus Ambassadors promote MAHE's academic programs and services to their peers and international students. They also play an essential role in supporting campus tours to international students and guests, ensuring a smooth transition into their new environment.

In addition, the Campus Ambassadors are very active on social media, where they share positive experiences of studying at MAHE. Through their online presence, they help build a positive reputation for the university and attract prospective students.

To become a Campus Ambassador of MAHE, students must apply form which the university carefully reviews. Selected candidates are then provided training and orientation on effectively promoting MAHE's programs and services. This training helps the Campus Ambassadors to develop the necessary skills and knowledge to represent MAHE accurately.

The Campus Ambassador programme typically runs for one academic year. The ambassadors undertake various activities such as organizing and participating in events, providing information about MAHE to their peers, and promoting the institution's various academic programs.

MAHE's Campus Ambassador program is an excellent opportunity for students to gain valuable experience in leadership and communication while making a meaningful impact on the university community. Through their efforts, the Campus Ambassadors help to foster a sense of community and Internationalization at home.

MAHE's Commitment to Internationalization

MAHE's commitment to Internationalization is reflected in its efforts to create a diverse and inclusive learning environment, promote knowledge transfer, and foster strategic partnerships. By doing so, MAHE aims to provide its students with a truly global education that prepares them for success in an increasingly interconnected world.

The university's focus on *global recognition* includes providing world-class education and research opportunities to students worldwide, and fostering partnerships with over 250 universities and institutions in more than 50 countries.

MAHE's dedication to knowledge transfer is demonstrated through its extensive research efforts and by regularly organizing conferences, workshops, and other events to disseminate knowledge and promote learning. The university's focus on diversity and inclusion creates a stimulating and enriching learning environment by welcoming students from different backgrounds, cultures, and nationalities and providing them with equal opportunities to learn and succeed.

MAHE's state-of-the-art facilities, including research labs, libraries, and sports facilities, offer a stimulating environment that fosters learning, creativity, and innovation. The university's strategic partnerships with other universities, research institutions, and industry partners help to create a globally interconnected community of scholars and professionals. These partnerships also provide students with opportunities for internships and employment and help develop new educational programs.

MAHE's Strategies for Internationalization

MAHE's multi-pronged internationalization strategy focuses on promoting its academic and research community globally, serving the international community, engaging with global partners to create synergy, and networking to become an essential partner in the global educational and research community. By doing so, MAHE is establishing itself as a leading player in the international academic and research community.

One fundamental way that MAHE promotes its academic and research community globally is through organizing and participating in international conferences, seminars, and workshops, publishing research articles in reputed international journals and collaborating with leading global universities and

research organizations. MAHE has established strong research collaborations with partners to offer Cotutle Ph.D. programs and promote joint grant applications, and foreign collaborators co-author 34% of MAHE's research papers. Additionally, adjunct faculty bring a global perspective to research and teaching-learning.

In addition to promoting its academic and research community globally, MAHE also serves the international community by offering its expertise and services. This includes offering online courses and certifications, providing consultation services, and conducting research projects that address global issues. By doing so, MAHE is establishing itself as a valuable resource for the international community and increasing its visibility and credibility on the worldwide stage.

MAHE also engages with global partners to create collaborative initiatives and programs that leverage its strengths and expertise. This includes joint research projects, student exchange programs, and international internships. Several pathway programs such as twinning, joint and dual degree options create many opportunities for MAHE's students to study abroad and gain employment in their dream country. By collaborating with global partners, MAHE can create synergies that benefit both parties and increase its international presence.

Finally, MAHE is actively networking with crucial global academic and research players. This includes organizing international conferences and seminars, participating in global academic and research networks, and collaborating with leading international universities and research organizations. By establishing itself as an essential partner in the global academic and research community, MAHE is increasing its visibility and credibility on a worldwide scale. Examples of MAHE's networking efforts include the Commonwealth Virtual Exchange in collaboration with the ACU and the Global Technology Solution program in partnership with the University of New Brunswick.

Conclusion

In conclusion, establishing an Office of Global Affairs in comprehensive universities is crucial in leveraging the benefits of Internationalization for both students and institutions. The office serves as a centralized hub for all international activities, supporting international students and faculty, navigating complex regulatory frameworks, and fostering a culture of Internationalization. The benefits of having a dedicated office for global affairs include an enhanced reputation, increased funding opportunities, improved research collaborations, and more diverse student bodies. Comprehensive universities must invest the necessary resources to establish an Office of Global Affairs to fully prepare students for success in a diverse and interconnected world.

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Technology's Role in the Future of Enhanced, Highly Immersive, Engaged, and Personalised Education

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The need for sustaining high-quality education through the COVID-19 pandemic not only accelerated the use, and acceptance, of online/digital modalities, but also dramatically re-envisioned the role, and use, of technology in the process of teaching and learning. While the initial focus was on enabling ease of connectivity when geographical colocation was not possible, significant efforts were also expended on developing technologies that could also enable virtual engagement of groups, small and large, as a means of increasing social interaction and group learning that would otherwise have been impossible. The focus, however, also fast-tracked the development and implementation of a range of technologies that have since changed the modalities of teaching, learning, and assessment, as well as given new directions to the development of campuses, moving from purely physical to a combination of physical and digital presence and interactions enabling a 'phygital' future for a campus. The developments in technology are not only providing a fresh palette of modalities for instruction and the dissemination of knowledge, but are also significantly enhancing the mechanisms of learning, providing new opportunities for institutions of higher education to enhance the quality of education, and emphasizing equity of opportunity and greater access for all learners, while also offering new mechanisms for greater engagement between those with knowledge and those seeking it, and for bringing the world (and through it critical experiences) into the classroom. It should be emphasized that these same technologies have also redefined the "classroom" from being a purely physical location with students/learners and instructor/coach geographically collocated to a more open architecture that connects the two and under the best of circumstances extends the definition of a student from the more formal, age and time-constrained focus, to one emphasizing a desire to learn, i.e., gain new knowledge. These technologies also theoretically enable the provision of knowledge "on demand", 24/7/365, both in the traditional formal structures of courses and degrees, and in the more accessible, flexible, and agile format of modules and competencies.

Just as the Gutenberg press irreversibly changed the way knowledge was shared, digital technologies are helping transform education from an industrial revolution based "one size fits all" historical paradigm where students receive the same information, at the same time, and at the same pace, akin to an assembly line, to one that can be self-paced, adaptive, and personalized - focusing on the individual learner. Rather than knowledge transfer being passive in the commonly seen "sage on the stage" mode, wherein the interaction follows the lecture-based modality without significant opportunity for true engagement, especially at scale (i.e., with large numbers of learners at the same time) the interaction through technologies is now increasingly fully immersive, active, collaborative, and inquiry focused. It must be remembered that the true online/digital modality offers far more than a video that attempts to replicate the traditional "talking head" in a classroom. This mode should more correctly be termed *Remote Emergency Teaching* rather than online education. The modality also provides flexibility, in reducing the previous constraints of time, space, and location, enabling access to larger numbers of learners, and more effectively combining the pursuit of academic knowledge and credentials with other responsibilities of life. It also has the potential to result in a lower cost to the learner increasing equity of opportunity and truly democratizing access to knowledge. All of these have significant importance to the enhancement of higher education in India following the ambitious goals set forth in NEP- 2020, most of which cannot be realized in a short period of time through a singular focus on traditional modes of delivery of instruction and use of only 'bricks-and-mortar' based facilities.

It should, however, be emphasized that while the use of fully online and immersive modalities will continue to increase, the use of hybrid modalities combining the current best of traditional face-to-face instruction with the flexibility and scope of digital modalities is likely to not only provide the most appropriate paths forward but also those that best

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combine pedagogy (as applied to the "traditional" students) and andragogy as applied to adults and returning students. It is in this vein that one must also look at the future of education as one emphasizing a life-long endeavor for the latest information and skills, with the learner/employee constantly updating competencies to stay on the path as a productive and valued member of the workforce.

While the most common use of technology in this area is in connecting the expert/instructor to the learner, there are a large set of additional technology-enabled aspects that are significantly changing the delivery, modality, and efficacy of instruction and learning and could have an even greater impact on higher education in the near future. These are discussed in brief in the following sections under 7 primary dimensions of (1) enhancing access, (2) connectivity at scale, (3) virtual and hybrid/integrated group work, (4) AI/ML powered learning, (5) enhanced discovery, (6) fully immersive learning, and (7) use of AR/VR for integrating academic knowledge with work experience and skills.

Access

In the past access may well have been limited by space with the cost of opening new universities and sustaining them through economic changes being too high to substantially increase the number of students admitted to institutions of higher education. In addition, the need for geographical and physical colocation of the student, the faculty, and the institution created constraints on who could, and would, attend and teach. In turn, these constraints led to metrics such as wealth, test scores, and others as a means of de-selecting from a large number of applicants, justifying this on the basis of "excellence" and "preparation," creating artificial barriers for all others. However, the increasing sophistication, and successful use, of digital modalities of learning have significantly enhanced our ability to both reach, and teach, a much larger number of students. Through the use of a range of modalities from face-to-face (the traditional mode) to fully online immersive, synchronous, and asynchronous access, to the use of hybrid, hyflex, flipped, and modalities, learning is now possible for a much larger number of students unconstrained by the physical infrastructure and footprint of a university/college. While there is undoubtedly great value to the social interaction that is made possible through the traditional 4-year residential mode, this was already not possible for an increasing population for reasons ranging from cost to family and work responsibilities. If we were, today, to design with a fresh sheet of paper, we might best posit it as a case of how the opportunity of higher education could best be brought to the student rather than the other way around. Thus, students would have a palette of options ranging from the traditional mode to that of fully immersed online learning with hybrids and combinations in between, including that of facilitated learning with the actual instruction being online with support being in a face-to-face mode at local centers in a manner that has been successfully demonstrated for years in South America for rural populations. Multiple modes would exponentially increase the number of opportunities for higher education making access a question of desire and commitment on the part of the student rather than of the chances of birth, geography, or high school. The provision of multiple modes would provide greater equity for those who are unable to sync work and class schedules, have family obligations such as children or elderly parents, or have to travel as part of their work/career.

Building Greater Connectivity between Centers of Knowledge and Learners

Traditionally, learners have had to go to Institutions of Higher Education (IHE) to access knowledge. This, intrinsically, restricted access to those fortunate to stay/work in close geographical proximity to the IHE or have the resources to travel to the IHE. This has often disadvantaged those living in rural areas, belonging to lower socio-economic demographics, and even with family responsibilities such as those related to looking after children or the elderly. Technological advances have made it not only possible for access to be enabled through digital means relieving the necessity for close geographical colocation and travel but have also increased the flexibility of connection and engagement. While much has been made of the use of Zoom, Teams, Webex, and similar platforms, for meetings and the delivery of lectures during the pandemic, these advances also created advanced channels for greater connectivity bringing learners and experts together, even if they are in different time-zones and thousands of miles apart. The ability to effectively take knowledge to where the learners are, greatly expands the ability of IHEs, and disciplinary experts, to meet the mission of higher education (and for that matter continuing- and professional education), enabling knowledge to be accessed as, when, and where needed. It also ensures

that engagement between interested parties is no longer predicated on the resolution of complex travel logistics. From meetings between student/learner and learned faculty members, and discussions between experts at different locations across the globe, to meetings held between people in different time zones, technology is making it easier to engage, including in full immersive mode, building greater connectivity. Technology also acts as an equalizer for those who are shy or need more time to prepare for engagement. In traditional classrooms, a large segment of the population could be left out being overwhelmed by a few who dominate the conversation and the available time. In addition, the instructor/moderator now has enhanced tools to both encourage, and coordinate, participation, thereby enhancing equity in involvement.

Enabling Virtual Group Work Using Online Tools Both During and Outside Class

Learning often happens best through peer-to-peer interactions. The division of students in a class into smaller groups allows for greater engagement and interaction between the students themselves, and between the instructor and their students, not just through exploratory and experiential activities but through deeper dialogue and discussion otherwise impossible in large traditional classes. However, the increasing number of students and decreased resources make expanding this difficult in the traditional mode. Digital technologies enable virtual groups to be formed simultaneously, both formally and informally, adding to peer-to-peer learning unrestricted by constraints of space as in the physical world where classroom space for group activities is often an impediment. In addition, these tools enhance flexibility in the time since groups can now meet at times convenient for members of the group unconstrained by university schedules. The structure also allows the instructor to move between groups engaging as needed with individuals and/or groups while maintaining an overall connection with all groups. Ideas and instructions can be provided in real-time both to the entire class and to specific groups with the instructor now serving more as a coach, mentor, and enabler. Projects can also be designed to ensure the participation of all members in the group obviating the concern of a few individuals carrying most of the load within a group.

Modularizing Delivery and Increasing Individualized Curricula

The increased use of digital technology and precepts of adaptive learning/teaching could enable students to progress at their own pace (within broad guidelines) and based on the knowledge and skills they bring to each aspect of the curriculum. We need to modularize our offerings to create a flexible and personalized learning experience. All of us have heard of the mythic brilliant student who dropped out because of boredom and a too-slow learning pace as well as the student who had great difficulty progressing just because they needed a bit more attention to catch up. In today's world, faculty no longer need to teach for the "lowest common denominator" losing many students outside that group in the process. Instead, we need to modularize our offerings to both provide equity of opportunity and pace as well as "knowledge in a package." This way, students get to learn at their individual levels of comprehension. Certifications and stackable degrees can no longer be dreams. They need to be embraced and implemented, building professional certifications along the way so that students gain both academic knowledge and professional credibility. These certifications and micro-credentials could also serve as a way for students to re-enter or advance in the workforce while they learn rather than being confined to a degree's time structure and therefore unable to manage outside responsibilities. This not only creates many more affordable educational opportunities but also ensures that students with outside responsibilities can "stop out" and gain from the credentials/certifications awarded up to that point. Students can progress in their careers and return to their education at a later date.

AI and ML Powered Learning

Beyond the use of AI/ML as related to adaptive learning, the development of customized pathways where learners can move at a pace that is the best for them individually while still focusing on overall timelines for completion, and as a driver of 'gateway' courses to which students come with a range of prior knowledge making it totally ineffective to use the 'one size fits all' traditional methodology, there are growing efforts, and initial implementation, of AI-enabled tutors able to serve as 'virtual' teaching assistants through discussion/tutorial sessions. This not only increases the number of learners who can be served but also enhances availability from specific hours to a 24/7 schedule ensuring that routine assistance is available as, and when, the learner requires it, thereby reducing the frustration of not being able to get help as needed. AI-assisted grading of assignments along with

assistance in punctuation and grammar, as well as in style, are also being considered through partnerships between IHEs and publishing/assessment companies. In addition, platforms using AI are already being used to assist in 'early-warning' systems and for consequent personalized academic programming and enrichment although some of the subsequent steps are still handled through traditional means. The ability, however, to interrogate data on a continuous basis and to use trends to forecast potential outcomes can be extremely valuable in ensuring that the appropriate support and assistance are provided to learners in a timely manner that better enables student success. In the traditional mode intervention, if any, is often too late to make a difference toward a successful outcome in the same term. It is important to emphasize that true, long-term, success in this area will necessitate the integration of systems, the removal of data silos, and the creation of a culture of awareness of data that includes the addressing of extremely critical issues related to privacy and potential misuse of data.

Enabling Greater Ease of Inclusion of 'What-If' Scenarios

True learning is enabled by a move away from the dualistic mode of True/False and correct/incorrect to one based on discovering paths between options and enquiring about the "what-ifs" and "why-nots," to discern and understand. The use of simulation tools easily incorporated into a digital learning environment enables learners to explore multiple paths, even engaging in new discoveries within the structure of a course. While simulation tools have been used successfully in the traditional site-based (face-to-face) environment, technological advancements linked to an online/digital environment releases several restrictions related to parameters of use, the inclusion of groups, and the use of multiple/different scenarios within the same class, allowing for personalization and adaptation of the scenarios to the individual or groups of learners. Laboratory sections have been used traditionally to increase a student's understanding of phenomena (e.g., chemical reactions) or situations (e.g., operating a turbine). Over the years, aspects such as cost considerations, increases in class sizes, and safety concerns have decreased the students' ability to use these in a modality catalyzing learning through inquiry and discovery. Increasingly, these are conducted as demonstrations or in group settings with only one or two students getting the hands-on experience with others involved, at best, as highly engaged spectators. The online environment enables all to be engaged, varying the experiment by the individual, allowing for multiple runs, with different parameters, at a student's own pace, and even learning through modes inaccessible in the traditional classroom – such as the effects of an oil spill on the environment, or a region being flooded due to poor design of storm surge mitigation measures, or a nuclear reactor core going 'critical'.

Providing Fully Immersive 'Real-world' Scenarios for Learning and Training

Advances in Augmented Realty (AR) and Virtual Reality (VR) technologies have made it possible to provide 'real world' scenarios to learners, individually and in groups, including transforming the 'class' into a manufacturing assembly line, a hospital, a construction site, an archeological 'dig' etc. - providing experiences that would otherwise be difficult at scale. The ability to teach/train nursing students to work under stress associated with the rapidly changing and fast-deteriorating condition of a patient who is dying, or for engineers to see the results of decisions that lead to catastrophic failure are tremendous experiential tools. Similarly, the ability to "immerse" students in the times of the French revolution or the Indian freedom movement can provide a far greater appreciation and understanding of history, the socio-cultural norms prevalent in those times, and the effect of decisions taken. Consider for example the ability to immerse students into scenarios associated with the discussions around the drafting of the Constitutions or the writing of the Bill of Rights, and the consequent deeper appreciation of the significance of the events and the strength and frailties of the people making those decisions in tumultuous times. At another level, these advances can also provide students the ability to 'visit' museums and art galleries, interacting with exhibits and studying them through being 'transported' historically and socio-culturally into a world that otherwise would only be available to very few with the majority experiencing these through single dimensional books and videos. A further advantage already in use is that of full immersion in learning a language and simultaneously imbibing the culture associated with a region without having to travel to that region, bringing equity of opportunity to a far greater number of learners. While the examples provided in this section pertain primarily to students at a university, these technologies have a

similar impact when deployed for the re-skilling and upskilling of employees.

Using AR/VR to Integrate Work and Learning

Work-integrated learning is traditionally facilitated through structured experiences such as practicums, internships, co-ops, and mentored field experiences. While extremely effective if designed appropriately their use is constrained by the curricular structure at some IHEs as well as limitations on the number of participants and the need for geographical co-location. Advances in digital technology, including through AR/VR, provide additional avenues, not just for greater incorporation of such modalities into the curriculum but also for greater integration of systematic and purposeful work experience as part of a credential. The ability to 'immerse' the learner in the work environment virtually provides a significant potential of directly linking academic course work to the real-world application as well as the ability for the learner to expand their experience at the intersection of humanistic skills with those of function, know-how, and technology. The ability to be a part of a team through virtual attendance at meetings, and to be immersed in a digital twin of the manufacturing line with insight into, and structured control of, equipment and logistics is a possibility hereto far not envisaged. Students specializing in manufacturing, for example, would be able to not just learn theory, but also gain experience through actual assembly lines and manufacturing processes through structured interactions enabled by technology. While the discussion about the dichotomy between academic knowledge and workforce talent development is unlikely to be ended anytime soon, the advances in technology will undoubtedly resolve some of the issues, providing value without diluting the academic rigor, further integrating intellectual development through academic knowledge with talent development for success in the workforce.

Summary and Conclusion

When implemented with purpose, technology can, and is already, transforming higher education. Our challenge, and opportunity, is to incorporate these tools in a systematic, integrated, manner putting the learner at the center and dismissing the NIMBY (not in my backyard) attitude regarding new technologies. Success requires adequate planning prior to implementation including (a) ensuring that learners have easy access to the technology and the digital divide (including internet/Wifi access) does not further inequities, (b) assuring adequate ongoing budgets not just for the acquisition of technology tools but also for their maintenance and upgrade and for the hiring of appropriately qualified support personnel, (c) enhancing technology support for learners and faculty 24/7, (d) evaluating current metrics of assessment to ensure that they are appropriate and modifying them as needed to align with the new models of instruction and engagement, and (e) being open to continuous assessment of outcomes and improving the connection between learners and those imparting knowledge irrespective of whether they are geographically co-located, or thousands of mile, and many time-zones, apart. In reality, most of the advances are of great impact when used in conjunction with the traditional classroom modality, providing enhanced options, and the ability to use 'immersive' experiences to augment traditional instruction. The focus, as always, should be on enabling the most transformative experiences for the learner, ensuring that the mechanisms and modalities that enable learning as such as to not only provide rote knowledge but rather to ensure the true development of skills of problem-solving, critical, and independent thinking, and communications, while simultaneously developing in each learner the joy of discovery and the curiosity of inquiry.

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Emerging Technologies and the Future of Education: Opportunities and Challenges

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Emerging technologies are transforming the global marketplace and creating new opportunities for individuals and organizations. While there are several technologies that can be considered emerging, this article limits its discussion to the popular ones such as AI-ML, Blockchain, 5G, AR-VR, IoT and Autonomous Vehicles. Students and employees aspiring to gain expertise in these technologies, and their applications, need to develop multidisciplinary knowledge, in addition to soft skills. Recognizing the growing importance of this, NEP 2020 makes important recommendations, and additionally, suggests how higher education institutions can prepare their students to work in a marketplace that adopts emerging technologies. India as a country possesses certain unique advantages to meet the growing demand for emerging technologies, such as its large and talented workforce, government support, and strong start-up ecosystem. Having said that, there are certain regulatory hurdles that can impact the adoption of emerging technologies which have to be addressed comprehensively to succeed and sustain in this space.

A National Imperative

Expertise in emerging technologies can help a country to be innovative and stay competitive in the global marketplace. Countries that are at the forefront of these technologies can develop new products, services, and business models that give them an edge over others. This can lead to new job creation and economic growth. As new industries and businesses emerge around these technologies, they can create jobs in areas such as research and development, manufacturing, marketing, and sales. Adoption of emerging technologies can lead to improved productivity and efficiency. For example, automation technologies can help reduce labour costs and increase efficiency in manufacturing and logistics. All this can result in an improved quality of life, which can in turn enhance a country's reputation and attractiveness to investors and tourists. Overall, expertise in emerging technologies can help countries stay ahead of the curve and capitalize on new opportunities in the global marketplace, leading to increased economic growth and competitiveness (Abichandani et al., 2022).

Emerging Technologies

It is difficult to offer a precise definition for the term "*emerging technologies"*. In the most general sense, the term refers simply to technologies at a given point in time, that has been developed most recently, particularly those that have not yet been adopted widely, so the list of emerging technologies that are considered advanced will change over time. Often that change happens gradually, with incremental technological improvements resulting in relatively little difference between well-established technologies and those on the cutting edge. But sometimes change comes more rapidly, with major improvements and fundamentally new capabilities appearing in a short period of time, offering tremendous potential but also tremendous challenges (Maxine L. Savitz & Robert F. Sproull, 2022).

There are several emerging technologies that have gained popularity in recent years. Here is an assimilated list of the most popular ones with a very brief explanation:

Artificial Intelligence (AI): AI involves creating intelligent machines that can think and work like humans. It has several applications, including natural language processing, robotics, and image recognition.

Internet of Things (IoT): IoT is the network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, and connectivity that enables these objects to connect and exchange data.

Blockchain**:** Blockchain is a decentralized, distributed ledger that can be used to record transactions across many computers in a secure, tamper-resistant way. It has been used in cryptocurrencies, but also has potential applications in supply chain management and other industries.

5G Networks: 5G is the fifth generation of wireless technology, offering faster data speeds, lower latency,

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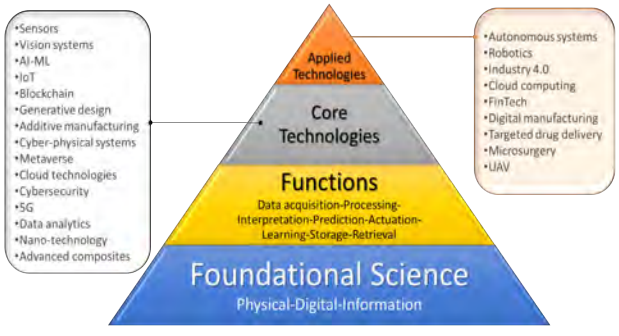
and increased connectivity compared to previous generations. It has the potential to transform several industries, including healthcare and transportation.

***Augmented Reality* (AR) and *Virtual Reality* (VR)**: AR and VR are technologies that overlay digital content onto the physical world (AR) or create immersive, simulated environments (VR). They have applications in entertainment, education, and other industries.

Autonomous Vehicles: Autonomous vehicles use AI and sensors to navigate without human input. They have the potential to revolutionize transportation and reduce accidents caused by human error.

These are just a few examples of popular emerging technologies, and there are many others that are also gaining traction and are likely to shape the future. The structure of the emerging technologies is represented in figure 1.

Figure 1: Structure of Emerging Technologies



Skill Requirement

To excel in emerging technologies, one needs a combination of technical and soft skills (PTI, 2019), (Quacquarelli Symonds (QS), 2018), (Harrington et al., 2020). Here are some of the key skills that can help students and employees succeed in these fields:

Technical Skills: Depending on the technology, one may need a variety of technical skills, such as programming, data analysis, machine learning, and cybersecurity. One should be proficient in the relevant programming languages and have a solid understanding of algorithms, data structures, and system design principles.

Analytical Thinking: Analytical thinking is essential to identify problems and develop solutions. One should be able to break down complex problems into smaller, manageable components, and apply critical thinking and problem-solving skills to develop effective solutions.

Creativity: Emerging technologies often require creative thinking to develop innovative solutions. One should be able to think outside the box, experiment with different approaches, and take calculated risks to achieve breakthroughs.

Communication: Communication skills are crucial in emerging technology fields, as one will need to communicate complex ideas and technical concepts to a wide range of audiences, including non-technical stakeholders.

Lifelong Learning: Emerging technologies are constantly evolving, and one needs to be able to keep up with the latest developments and learn new skills quickly. One should have a strong appetite for learning and be willing to continually upgrade the skills to stay current.

Collaboration: Collaboration is important in emerging technology fields, as one will often need to work in interdisciplinary teams with people from diverse backgrounds and skill sets. One should be able to work effectively with others, build strong relationships, and contribute to team goals.

These are just a few examples of the skills one needs to excel in emerging technology fields. The specific skills required will vary depending on the technology and the industry one is working in.

National Education Policy-- 2020

India's National Education Policy 2020 (National Education Policy 2020, 2020) aims to promote competency building in emerging technologies by incorporating several initiatives and reforms across different levels of education. Here are some of the ways in which the policy supports competency-building in emerging technologies.

Introduction of Emerging Technologies in School Curriculum

The policy emphasizes the need to introduce emerging technologies such as artificial intelligence, machine learning, coding, and robotics in school curriculums, starting from the primary level. This will help students develop an understanding of these technologies and build basic competencies from an early age.

Focus on Multidisciplinary Learning

The policy promotes multidisciplinary learning by encouraging students to take up a combination of subjects, including STEM (Science, Technology, Engineering, and Mathematics) and liberal arts. This

approach will help students develop a well-rounded understanding of technology, its implications, and its role in society.

Establishment of the National Educational Technology Forum (NETF)

The policy proposes the establishment of a National Educational Technology Forum (NETF), which will act as a platform for the exchange of ideas, best practices, and resources related to technology in education. The NETF will help build competencies in emerging technologies by providing teachers and students with access to high-quality resources and training.

Promotion of Vocational Education and Skills Training

The policy emphasizes the importance of vocational education and skills training and proposes the establishment of vocational education institutions in every district. This will help build competencies in emerging technologies among the workforce and promote entrepreneurship in the technology sector.

Establishment of National Research Foundation (NRF)

The policy proposes the establishment of a National Research Foundation (NRF), which will fund research in various fields, including emerging technologies. This will promote the development of innovative technologies and help build competencies in these fields.

Overall, India's National Education Policy--2020 supports competency building in emerging technologies by promoting the introduction of these technologies in school curriculums, encouraging multidisciplinary learning, establishing platforms for the exchange of ideas and resources, promoting vocational education and skills training, and funding research in emerging technologies.

Role of HEIs

To prepare their students for a marketplace that adopts emerging technologies, universities can take several steps, some of which are presented here.

Incorporating Emerging Technologies into the Curriculum (Abichandani et al., 2022)

Universities can incorporate emerging technologies into their curriculum, offering courses and programs that focus on topics such as AI, IoT, blockchain, 5G, quantum computing, and AR/VR. This can help students gain the technical skills they need to succeed in these fields. However, this will require competency building among faculty. Industry immersion, joint labs, professorship by practice and consultancy are some of the approaches to building faculty expertise.

Encouraging Collaboration and Interdisciplinary Learning (Julie Thompson Klein, 2005)

Emerging technologies often require collaboration across different disciplines. Universities can foster interdisciplinary learning by encouraging students to work on projects with students from other departments and offering courses that combine technical and non-technical skills. However, one should understand that true interdisciplinary learning happens when there is an active integration of disciplines and departments within universities. This requires a fundamental change in the University structure (Huber & Hutchings, 2004).

Adopting a Culture of Innovation

HEIs offering programs in emerging technologies need to adopt a culture of innovation. Technology-enabled learning, remote/ virtual labs, project-based learning, dual degree programs, cooperative education, and exploratory learning are some of the innovative pedagogical strategies that fit the context. The other effective way HEIs can inculcate an innovative culture is through incubation centres, which offer a fertile ambience for the students to experiment with their ideas without the fear of failure (Bordogna et al., 1993).

Offering Industry Partnerships and Internships (Mandke, 1980)

Universities can partner with companies in emerging technology fields and offer internships and co-op programs that provide students with hands-on experience working with these technologies. This can help students gain practical skills and make valuable industry connections. A more effective way is to adopt a work integrated learning pedagogy which is an educational approach that uses relevant work-based experiences to allow students to integrate theory with the meaningful practice of work as an intentional component of the curriculum (IJWIL, 2020).

Providing Career Services and Professional Development (Elvira et al., 2017)

Universities can offer career services and professional development programs that help students develop the soft skills they need to succeed in the workforce. This can include workshops on communication, critical thinking, and leadership, as well as networking events and mentorship programs.

Emphasizing Lifelong Learning (Stolk & Martello, 2015)

Emerging technologies are constantly evolving,

and students need to be able to keep up with the latest developments. Universities can emphasize the importance of lifelong learning by encouraging students to pursue continuing education and providing resources for professional development. Some of the popular universities have developed sustainable models of formal education to support the continuing education of working professionals which can be popularized across the country with the necessary regulatory framework (Vijay V. Mandke, 1992).

By taking these steps, universities can help prepare their students for a marketplace that adopts emerging technologies and equip them with the skills and knowledge they need to succeed in these fields.

India's Unique Advantage

India has several unique advantages that can help it meet the growing demand for emerging technologies. Some of these advantages are presented here.

Large and Growing Talent Pool

India has a large and growing talent pool of skilled professionals in the fields of technology and engineering. The country has a strong education system and produces a large number of graduates in these fields each year (Wheebox, 2023).

Low Labor Costs

India has a cost advantage compared to other countries in the field of technology due to its lower labor costs. This makes it an attractive location for companies looking to set up technology operations (*The Average Salary in India for 2023 (Comparison, Outsourcing)*, n.d.).

English Language Proficiency

India has a large number of English-speaking professionals, which makes it easier for companies to communicate and collaborate with their Indian counterparts (*A Comparison of India with Other Outsourcing Destinations - O2I*, n.d.).

Government Support

The Indian government has launched several initiatives to support the growth of the technology sector, including the Digital India initiative (*Digital India*, n.d.) and the Make in India program (*Make in India*, n.d.). These initiatives aim to improve the infrastructure, promote innovation, and attract foreign investment.

Strong Start-up Ecosystem

India has a vibrant start-up ecosystem, with several innovative companies emerging in the fields of AI, blockchain, IoT, and other emerging technologies. The country has a supportive environment for start-ups, with access to funding, mentorship, and other resources (*Startup India*, 2023).

These advantages position India well to meet the growing demand for emerging technologies, and the country is already a major player in the global technology industry. With continued investment in education, infrastructure, and innovation, India is poised to continue to grow and thrive in this field.

Regulatory Challenges

There are regulatory hurdles as given below that can impact the adoption of emerging technologies in some countries.

Data Protection and Privacy

Emerging technologies such as AI and IoT often require the use of personal data, which can raise concerns about privacy and data protection. Regulators may impose restrictions on how companies collect, store, and use personal data, which can impact the development and adoption of these technologies.

Intellectual Property

Emerging technologies often involve new inventions and innovations, which can raise questions about intellectual property rights. Companies may face challenges in obtaining patents and protecting their intellectual property, which can impact their ability to commercialize these technologies.

Cybersecurity

Emerging technologies can also raise concerns about cybersecurity and data breaches. Regulators may impose stricter standards and requirements for cybersecurity, which can add to the cost and complexity of developing and implementing these technologies.

Regulatory Approval

Some emerging technologies may require regulatory approval before they can be commercialized. This can be a lengthy and costly process, which can slow down the adoption of these technologies.

Ethical and Social Issues

Emerging technologies can also raise ethical and social issues, such as the impact on employment, the environment, and social justice. Regulators may impose restrictions or requirements to address these issues, which can impact the development and adoption of these technologies.

These regulatory hurdles can vary depending on the country and the specific technology involved. Companies need to be aware of these hurdles and work closely with regulators and other stakeholders to address them and ensure that their technologies comply with relevant regulations and standards.

Conclusion

In conclusion, emerging technologies are rapidly transforming the global marketplace, and companies need skilled professionals who can navigate and excel in these fields. Universities play a critical role in preparing students for this marketplace by incorporating emerging technologies into the curriculum, offering industry partnerships and internships, providing career services and professional development, and emphasizing the importance of lifelong learning. This has been well recognized by the NEP 2020, which makes specific recommendations for HEIs. India as a country has several unique advantages that position it well to meet the growing demand for emerging technologies, including its large talent pool, low labor costs, English language proficiency, government support, and strong start-up ecosystem. However, companies must also be aware of the regulatory hurdles that can impact the adoption of these technologies, including data protection and privacy, intellectual property, cybersecurity, regulatory approval, and ethical and social issues. Organizations and academic institutions need to be aware of these regulatory hurdles and work closely with each other and regulators and other stakeholders to address them to succeed and sustain in this space.

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How Technology is Reforming and Transforming the Higher Education System

Annpurna Nautiyal*

While addressing the inaugural session of the post-budget sessions organized jointly by the Ministry of Electronics and IT and the Department of promotion of industry and internal trade on the theme 'Unleashing the Potential-Ease of Living Using Technology', Government of India, Hon'ble Prime Minister of India clearly indicated that 21st century is a technology-driven era therefore, we have to reap its benefits by making use of it in every area of our day to day life. His message was loud and clear that time is just like money therefore, compliance in a set time frame with the participation of people will provide big gains as technology is meant not only to empower people but also to promote ease of living. If we assess the various stages of global development we find that from 1968 to 1990 was the era of growth, from 1990 to 2010 was the era of technological development and the present era is devoted to the vigorous use of technology for making human life easy, less problematic and comfortable. The Prime minister also gave examples of the intervention of technology in areas like *one nation one ration card*, *direct beneficiary transfer*, *Aarogya Setu* developed during COVID, faceless Tax Reform, E Challans, *Digilocker* which could be useful for MSME also, and mission *Karmyogi*, etc. which have brought lots of transparency to realize the aim of less government but good governance.

The Prime Minister spoke about how India has to promote technology with the human touch and it should never act as a hurdle or enhance problems for human beings through its complicated uses but it should provide a common service network for increasing the ease of living. If we talk about the education sector multiple changes are evident in the way, the institutions have adopted the mantra of digitalization. They are using technology in each branch of teaching, whether learning, online teaching and learning, credit transfer through the academic bank of credit, Digi locker, sharing of knowledge and ideas, expanding collaborations, cooperation and connections nationally and internationally which is changing educational climate and leading towards universalization of education through following global parameters. The various apps and portals like *SAMARTH*, *PARAKH*, *DIKSHA* are also meant to expand and enhance the quality of education and educators by providing digital infrastructures for knowledge sharing and engaged learning. This is a clear message that if our educational institutions fail to come up to the expectations of stakeholders in a fast-changing world and make the young generation skillful to the fact that the challenge of the present era, the goals of NEP- 2020 will remain unfulfilled. This conversion into research and innovation for human welfare is necessary. The national research foundation is aimed at this purpose as well as promoting good quality research in humanities and social sciences also.

The Prime Minister also invoked the attention of all stakeholders towards the advantages of technologies like 5 G and Artificial Intelligence which are promoting the ease of living by giving seamless connectivity at a fast speed and also helping data collection and dissemination of information which are important tools of teaching, learning, and research. The reach of AI is so vast that it can be used for data collection from different remotest and geographically difficult locations for academic or any research purposes to deliver of medicines in rural or disaster-prone areas. Drones are frequently being used for this purpose. But the Prime Minister also challenged the stakeholders to suggest at least ten new uses of AI so that these can be applied for the benefit of human beings. If the research is not human-centric the purpose of education will also be defeated. The Prime minister's advice is that in the age of knowledge and technology, universities should also try to fill the gap of the digital divide by providing the right platforms to young minds so that their energies, and hunger for more knowledge could be satisfied by the updated and knowledgeable teachers.

His continuous and very noble focus was on mentoring, hand holding and removing difficulties and

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making technologies user-friendly for the benefit of all the people including those standing on the lowest ladder of development is very important for ease of living. This also supports the aim of access, equity, inclusivity, affordability, and capacity building of the students for critical and creative thinking as per the requirement of the NEP- 2020. It also aims to achieve the target of multiple entry and exit, multidisciplinary and multilingual education, academic bank of credit, digital education, collaboration and connect with national and international institutions and skill development through *'Skill Hub Initiative'* under *Pradhan Mantri Kaushal Vikas Yojana* to make education more relevant and create a skilled pool of people ready to be employed by the industry. For realizing the goal of training skilled manpower in the age group of 15 to 45 the ministry of Skill Development and Entrepreneurship (MSDE) and the Ministry of Education have joined hands. The focus is on advanced skill training on new age courses like AI, Blockchain, 3D printing, Drone, etc. which are demand driven. These courses can also provide support not only to Prime Minister's *Gati Shakti* scheme but also the much-needed educational diversity to the students. The focus on producing a big pool of employment generators not employment seekers also indicates the importance of skill-based knowledge. The prime Minister also cautioned that the demographic dividend which is in India's favor at present should be secured for obtaining the benefits of advanced technologies and promoting more diverse skills. The educators and industry have to play an important role in this scenario by nurturing, monitoring, mentoring, and motivating the youth to step into this knowledge era through their capacity building through skill-oriented education and encouraging entrepreneurship among them.

During the era of growth and technological development from 1968 to 2010 global politics was shaped mostly by the US as it was the master of innovation but the Artificial intelligence has made the current era a levelled playing field. As it is exposing and gives a platform for regular upgradation of scientific and technological innovations which indicates that the power is not only stemming from the barrel of a gun but also from any country's ability to innovations and improvements in the available technology. In the present era, knowledge and innovation have emerged as another source of national power about which our Prime Minister very correctly reminded us. In this context, we can learn a lot from a war-torn country like Ukraine and its Ministry of Digital Transformation, which Ukrainian President Volodymyr Zelensky had established just two years before the war. As Eric Schmidt in his very well-written and timely article published in the March/April 2023 *Issue of Foreign Affairs on Innovation Power: Why Technologies will define the future of geopolitics* has very aptly highlighted that the commencement of the e-governance mobile app, *Diia*, for open-source intelligence collection, to enable the citizens to upload photos and videos of enemy military units as well as tuning into *Star link* satellites and ground stations of *Space X* to stay connected allowed Ukraine to keep on advancing its defence tactics despite all odds against it. Russia miscalculated the technological power of Ukraine and assumed that it will capture Kiev without any problem and with much resistance. But the Ukrainians with the help of weaponry support from the US and EU and their advanced Artificial Intelligence technology and operations of drones not only timely intercepted Russian missile attacks but also saved their population from its fire. This was done with the help of technology and new innovations which has made Russia's mission impossible.

Conclusion

The developments and advancements in *artificial intelligence* in particular not only open the door for immediate scientific innovation but it can also promote the skill of scientists, engineers, educators, and students to learn more focused technologies, nurturing advances in artificial intelligence in other fields. Eric Schmidt has rightly pointed out that from now onwards the military, economic, and cultural power will rest on the ability to innovate faster and better which will define the outcome of the great-power competition. In view of this, our Prime Minister's emphasis on understanding the urgency of promoting innovations for serving the nation's interests in a very competitive era is very timely as the innovation era will only decide the future of a country, community, society, democracy and the contours of the global order because the expertise and control would slowly shift to AI. Therefore, the lack of visionary leaders and educationists will be an obstructing factor in facilitating this change and allowing India to play a leading role in all areas.

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Six Digital Initiatives for Promoting Inclusive and Quality Higher Education

Pradeep Kumar Misra*

Higher Education has emerged as a critical social and economic development determinant and has been seen as essential to maintain a country's competitiveness in the global economy, modernization, and development. Teixeira, Gonçalves, and Taylor (2021) observe that higher education 'Influences employment and quality of life at work; increases knowledge and skills; provides differentiated training; technical and scientific knowledge; flexibility and adaptability' (p.11). This realization has triggered many countries to promote higher education on a grander scale. Consequently, the demand for higher education has seen a quantum leap in the last two to three decades in India, as noted by Chopra (2020), 'From the earlier notion of higher education, which was meant only for the elite, researchers have referred to this shift of higher education reaching the masses as the massification of higher education' (p.123).

According to the All-India Survey of Higher Education (AISHE) 2020-21, the Indian higher education sector has 1113 universities, 43796 colleges, and 11296 stand-alone- institutions. Total enrollment in higher education in India is 41.4 million, and Gross Enrolment Ratio (GER) is 27.3% (Department of Higher Education, 2022). India is the second-largest higher education system globally; every sixth global higher education student is an Indian. National Education Policy 2020 (NEP) of India recognizes the critical role of higher education in national development and aims to increase GER in higher education to 50% by 2035 (Ministry of Education, 2020).

However, despite the impressive growth of higher education, it is realized that the existing brick-and-mortar system of higher education alone cannot meet the massive demand for higher education. Moreover, it is crucial to spread high-quality higher education to both urban and rural areas, as there is a substantial difference in the quality of higher education between rural and urban higher education institutions (HEIs). Quality assurance has become more significant, witnessing a surge in enrolment in HEIs in recent years. Fortunately, digital technology has emerged as a viable means to support higher education on various parameters. As Henderson, Selwyn, and Aston (2015) noted, 'Digital technologies are now an integral aspect of the university student experience' (p.1). There is renewed faith among stakeholders, policymakers, and higher education practitioners that digital technology is vital in expanding higher education and can foster and support teaching and learning in many ways and provide numerous opportunities for all aspects of higher education.

Digital Technology

Digital technology includes electronic tools, systems, devices, and resources that generate, store, or process data. Examples of digital technology are social media, online games, multimedia, and mobile phones (State Government of Victoria, 2019). In comparison, Selwyn, et. al. (2016) suggest that digital technologies include the following: computers, tablets, smartphones, Facebook, Moodle, online library services, Google, YouTube, Content creation apps, and portable devices enabling people to access the Internet, not just from home but from any location. Accommodating all such suggestions, Pinto and Leite (2020, pp. 345-346) present a taxonomy for digital technologies supporting learning in higher education. This taxonomy includes the following ten categories with examples of tools:

- Learning Management Systems (LMS): Blackboard, Moodle, WebCT, Platforms supporting online courses, etc.-
- Publish and Share tools: Blogs, Wikis, Flickr, YouTube, Podcast, Social Bookmarking, e-portfolio, Digital storytelling, e-books, video lectures, etc.
- Collaborative systems: Google Docs, Social Bookmarking, Mind Maps, Wikis, Blogs, etc.
- Social networking: Facebook, Twitter, Hi5, LinkedIn, Ning, Academia.edu, etc.

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- Interpersonal Communication tools: email, MSN, Skype, Forums, Video-conferencing, etc.
- Content Aggregation tools: RSS feeds, NetVibes, Google Reader, etc.
- 3D Virtual Worlds: Second Life, Habbo, Augmented reality, Games, Virtual labs, etc.
- Assessment and Feedback systems: Electronic marking, Clickers, Audio feedback, Computer note-taking, etc.
- Mobile tools: mobile applications Internet-based.
- Information and Communication Technologies (ICT): software or applications Internet based

Post COVID-19, the use of digital technology in higher education has increased significantly. Contrary to the earlier practice of theoretical advocacy of using technology, the new trend is experimenting with technologies to create new possibilities and educational opportunities. Now, the main stakeholders of the higher education sector, i.e., students, faculty, institutional leaders, and policymakers, are more confident, positive, and hopeful regarding the visible and potential benefits of technology for the teaching-learning process and activities. The different initiatives taken by the Government of India, combined with the increased use of technology at the ground level, have given new hope and belief that effective and efficient use of technologies can make the higher education sector more accessible, equitable, and quality-driven. To make it happen, HEIs in India and globally may focus on and implement the following six digital initiatives for promoting inclusive and quality higher education in a systematic and time-bound manner.

Making Digital Pathways for The Inclusion of Mature Students in Higher Education

Many mature and passed-out students look to join higher education to get better employment opportunities or self-fulfillment. The path of mature students entering higher education is challenging as HEIs in India and across the globe prefer to cater to young students. Mature students are not able to join HEIs due to many reasons, including lack of time to pursue studies, lack of finance to pay program fees, family responsibilities, psychological barriers to joining educational campuses filled with younger students, and most notably, not meeting 'traditional' academic standards for admission in higher education. In principle, HEIs advocate for giving all students equal opportunities but make such policies and admission procedures where only a young cohort can apply and take admission. Highlighting these concerns with reference to the English Higher education system, Farini, and Scollan (2021) note

> [...] Higher Education system offers an interesting case for discussion, being caught between the principle of inclusiveness within a 'widening participation' agenda and the contrasting selective principle of 'recruiting with integrity.'

The calls for welcoming mature and older students in HEIs are gaining ground. It is noted that higher education must attract and retain a mounting cohort of mature students who have typically been 'on the margins' (Amundsen, 2022). As a reality, the higher education sector needs to prepare to welcome and accommodate mature students on their campuses, and HEIs need a policy or provision to admit such students. In addition, the lack of infrastructure and human resources also prevents HEIs from accepting mature students. However, if HEIs have to become genuinely inclusive in principle and practice, they must find a way to enroll and educate any mature student at any stage of life. Fortunately, digital technology can be a savior in this regard. The reasonable and creative use of digital technology in HEIs can ensure need-based higher education opportunities for excluded and mature students.

HEIs may adopt two digital pathways to bring mature students to their campuses. As a first pathway, HEIs may offer need-based certificates, degrees, or diplomas to mature students in a blended mode. The mature students may initially be invited to the campuses and oriented about the possible opportunities. Later they can be provided education in online mode with the provision of regular in-person contact opportunities. Such a move will help mature learners connect and benefit from HEIs. As a second pathway, HEIs may design and develop online higher education portals for admitting mature students. The portal may offer validated and certified short-duration programs targeting the specific learning needs of mature and in-employment learners. These digital pathways will ensure that no student feels deprived of higher education at any stage of life.

Updating the Digital Competencies of Teachers

Most teachers in higher education have first-hand experience using technologies for teaching-learning purposes. They have started using technologies for content searching, content dissemination, conducting online classes, giving presentations, distributing assignments, and even assessing assignments. Higher education teachers have started using technologies to take care of cognitive aspects but still, need to catch up with using technologies to work on affective and psychomotor aspects of students' learning. In the last few years, stimulated by the increasing availability and sophistication of digital technology, it has been argued that the adaptive and personalisable affordances of EdTech offer a way of addressing challenges facing education systems worldwide (Major & Francis, 2020). These affordances open up new, scalable opportunities for greater personalisation that adjust the learning experience (e.g., based on age, ability, prior knowledge, and personal relevance (FitzGerald, et. al., 2018).

A systematic literature review of teachers' digital competencies in higher education recognizes a low or medium-low digital competence among teachers and the absence of specific competencies, especially those related to the evaluation of educational practice (Basilotta-Gómez-Pablos, et. al., 2022). Therefore, updating the digital competencies of higher education teachers seems necessary for optimizing the possibilities digital technology offers for the teaching-learning process. It is argued that digitally competent teachers may ensure better learning gains from personalized, adaptive technology by offering contextualized input and feedback (Major & Francis, 2020). A report from Education Development Trust (n.d.) noted that: The latest international evidence shows that teachers remain central to successful remote student learning, but they face significant challenges. No matter how good the resources – from online platforms to radio broadcasts –evidence shows that student learning is dependent on substantial teacher-student engagement1. However, teachers face considerable challenges when working at a distance from students (p.1).

Therefore, HEIs must equip their faculty members with advanced digital teaching, learning, and assessment competencies. HEIs may motivate and facilitate their staff to learn and practice advanced competencies like using technologies for blended learning, making technologies a tool for collaboration and critical reflection on contents, mediating virtual spaces for experiential learning, providing online career counseling and guidance, offering need-based online courses, and conducting technology-mediated assessments. In consultation and support with policymakers, HEIs must organize need-based training and professional development programs to help faculty acquire these advanced digital teaching competencies.

Practicing Digital Assessments of Learning Activities

Assessment, making a judgment about any performance or activity, is an integral part of the education system (Misra, 2021, p.82). Educators use assessment for various reasons, mainly assessment for learning and assessment of learning. Talking about the relevance and significance of assessment, Misra (2021) observes,

> 'How much learners have learned' is one of the most asked questions among governments, policy planners, international and national organizations, educational institutions, educational administrators, teachers, and parents. They ask this question in different ways, but their intent remains the same (p.81).

Answers to all their questions are provided mainly by either assessment of learning or assessment for learning. Instead of several advances, assessment is still a concern in HEIs. Considering that the projected GER in higher education in 2035 is 50%, higher education institutions are required to evolve a mechanism for supporting traditional assessment methods and tools with digital assessment. Talking about the possibilities offered by technology-mediated assessment, a report from U S Department of Education (2017) argue

Technology can help us imagine and redefine assessment in a variety of ways. These tools can provide unobtrusive measurements for learners who are designing and building products, conducting experiments using mobile devices, and manipulating parameters in simulations. Problems can be situated in real-world environments, where students perform tasks or include multi-stage scenarios that simulate authentic, progressive engagement with the subject

matter. Teachers can access information on student progress and learning throughout the school day, which allows them to adapt instruction to personalize learning or intervene to address particular learning shortfalls (p.58).

Promoting digital 'assessment of learning' will lessen the financial and administrative burden and help practice and promote 'assessment for learning' in HEIs. The institutions may use online apps, digital portfolios, blogs, websites, and other digital footprints to assess students. The institutions must rely on existing online submissions and evaluations of assessments and try to make these systems more dynamic and transparent. Not only this, but the digital assessment will also offer an opportunity to assess students based on collaborative work and achievements rather than the traditional system of assessment based on assessing students individually. The institutions have to visualize that digital assessment will immensely help potential employers, and consider individuals' achievements and online profiles for making selections.

Designing Digital Exchanges for Students

The national and international student exchanges in higher education offer multifaceted benefits. However, national, and international exchanges of students are rare among HEIs. The scarcity of funds and lack of logistic support are the apparent reasons that most educational institutions are not participating in and offering such exchanges. On a positive note, HEIs may use digital technology-based virtual student exchanges nationally and internationally. Talking about virtual exchanges, Lanham, and Voskuil (2022) observe: Virtual exchange (VE) is a technology-enabled, collaborative international pedagogy that has been growing over the past two decades as an alternative to traditional study abroad. Instead of students traveling to another country to experience a different culture, they can engage in intercultural learning by collaborating on an online project with their peers around the world (p.3).

Higher education students may use virtual mode to participate in foreign institutions' teaching and research activities, conduct joint research projects, attend lectures, make publications, and even participate in cultural activities. Virtual exchange presents many learning and socialization opportunities for students, as noted by Rets and Rienties (2021).

Virtual exchange enables students in geographically distant locations to meet online to work together on shared subjects. Students in such virtual exchange projects meet and complete learning activities using widely available online communication tools […….]. Virtual exchange can enhance learning in areas such as foreign languages, digital skills and intercultural communication, research shows.

HEIs may explore and work further and prepare clear guidelines for virtual exchanges of students. HEIs may also train teachers and depute trained facilitators to support and guide students to engage formally and benefit from such virtual exchanges. The regulatory bodies may also recognize virtual collaborations and exchanges for different academic purposes and activities. The approval and recognition of the digital exchange of students at the national and international levels will help the holistic development of students and improve the quality of education. In addition, such exchanges will also open doors for gainful self-employment opportunities for students.

Practicing Digital Governance in Institutions

Governance is vital for the smooth and purposeful functioning of any educational institution. The irony with HIEs in India is that they are so engaged with managing and conducting peripheral activities like examinations, awarding degrees, and managing the affiliated colleges, that they hardly have any time to pay due diligence to their core activities, i.e., teaching, research, and extension. Due to over-engagement in routine governance activities, leadership in HEIs has little time to indulge in and take specific measures to improve the quality of educational offerings. This situation is adversely affecting the quality of higher education, as noted by Chopra (2020).

This peculiarity of the Indian education system is taking a toll on the real objective; and universities are burdened with conducting examinations around the year for its affiliated colleges with issuing hall tickets, setting and printing question papers, arranging time-tables, evaluating answer sheets, declaring results, arranging revaluation and so on. Automation of governance and administration

processes would enable a university to better focus on its basic objective (p. 130)

Digital governance or e-governance can facilitate improving transparency, providing speedy information dissemination, and improving administrative efficiency and public services in all aspects of education. It is beyond doubt that for the quantity and quality of output of our education system to substantially improve, there is no option but to introduce e-governance in this sphere (Shukla, 2011). E-governance is the performance of governance via the electronic medium to facilitate an efficient, speedy, and transparent process of disseminating information to the public and other agencies and for performing administration activities. E-governance involves new leadership styles, new ways of debating and deciding policy and investment, new ways of accessing education, new ways of listening to citizens, and new ways of organising and delivering information and services (UNESCO, 2015).

Irrespective of the long advocacy at the part of policy and research level, digital governance has yet to take shape in the majority of HEIs in a true sense. Usually, digital governance in HEIs is perceived and equated with the entry of data related to different aspects of the corporate life of the institution on computers and uploading circulars, programme details, and curricula on institutional websites. As a fact, this is only a fraction of digital governance. The purpose of digital governance is to enhance good governance and ensure participation, transparency, and accountability (UNESCO, 2015). Digital governance may help HEIs make governance more efficient and effective, lowering the institution's expenditure. In addition, digital governance may help connect society to HEIs, as noted by UNESCO (2015).

The use of information technology can increase the broad involvement of citizens in the process of governance at all levels by providing the possibility of online discussion groups and by enhancing the rapid development and effectiveness of pressure groups.

Digital governance is expected to bring much more to improve the functioning and outcome of HEIs. To realize the goal of digital governance, HEIs have to move towards capturing real-time data related to every aspect, i.e., academic, administrative, and financial. The institutions have to evolve a mechanism where any update or change in its academic, administrative, or financial domains must be reflected automatically before concerned authorities for the information and decision. The institutions may follow a policy of feeding and collecting data via online software rather than the isolated static data entry in individual computers. Real-time data-based digital governance will provide hassle-free education to students and save a lot of costs, time, and energy for administrators and faculty. It will also open HEIs to the public and bring more transparency, accountability, and productivity to higher education campuses.

Sketching Digital Profiles of Institutions

The stakeholders may learn about any higher education institution in three ways. The first and most convenient way is to visit the educational institution's website. The website of higher educational institutions mainly offers details of programs offered, institutional organization, available facilities, and details of faculty and administrative staff. The second way is to read the institution's National Assessment and Accreditation Council (NAAC) report. Nevertheless, only a handful of higher institutions in India have been assessed by NAAC so far. Furthermore, a third way is to visit the All India Survey of Higher Education portal to fetch information about the institution. Unfortunately, all these ways are separate, work in isolation, and are based on manual entry and uploading of data. As a result, it takes work for a student, parent, or even a policymaker to get an accurate picture of any higher education institution. Therefore, higher education institutions must move towards an all-inclusive dynamically-updated digital profiling system.

Used more to represent an individual, a digital profile is the sum of content about a person on the Internet. A digital profile can be composed of personal or professional information shared on public Web sites posted personally or by others (Kraakevik, 2016, p.87). A digital profile can include information about personal characteristics, behaviors, affiliations, connections, and interactions (TechTarget, 2023). Similarly, HEIs may consider creating an all-inclusive digital profile for their institutions. HEIs may evolve a mechanism to sketch a holistic digital profile of institutions detailing each aspect of

corporate life, whether related to the institution's financial management or actual examples of teaching-learning practices or engagement in social upliftment activities. HEIs may use this profiling to connect and interact with society, industry, and potential employers for students in real-time. Institutions' real-time dynamic digital profiling will bring more accountability, transparency, and efficiency, bringing higher education close to society and industry.

Conclusion

In a recent study, 'education rather than age structure brings demographic dividend,' Lutz et al. (2019) noted a clear dominance of improving education over age structure and gave evidence that the demographic dividend is driven by human capital. Fortunately, India already possesses an appropriate age structure with the expectation that by 2047, India will have 1.1 billion people in the working-age group (15-64) (Sahai & Singh, 2023) and an inclusive and quality higher education for this population can bring much more than the expected demographic dividend. The onus is on HEIs to contribute significantly to achieving this demographic dividend by taking needs-based and future-driven initiatives. Higher education providers may use the above-suggested six digital initiatives to offer inclusive and quality higher education and contribute significantly to India's social, sustainable, and economic development.

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(contd. from pg. 92)

factors along with a poor funding mechanism and system constraints like lack of proper scholarship, and international exposure add to the bottlenecks of collaborations.

The bright side is that things are changing and India is taking the right directives in ensuring that a project or any research does not suffer due to a lack of collaborative effort. Even the older mentality of just being bosses is migrating to become mentors. Thus, in the coming years, we can see a lot many collaborative research from India.

Hence, National and International collaborations form a strong foundation of research and is indispensable in today's world. India is quite successful in collaborative efforts and has a number of bilateral agreements with various countries. The Citation Per Article has improved tremendously in the last 5 years in the areas of Natural Science, Engineering, Biotechnology, and Cryogenics. The contribution of India is quite instrumental in the field of research and ranks in the 6th position. The annual national growth is around 14% and internationally at around 4%.

Hence, collaboration at the national and international levels is highly essential in boosting research.

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Integrating Skills with Higher Education

K Hemachandra Reddy*

The formative years of a student are spent acquiring knowledge from nursery to higher education. This knowledge helps the students develop their personalities, but it doesn't arm them with the requisite practical skills that provide a better chance of employability. Increasingly, the majority of employment opportunities necessitate the youth to have hands-on experience and be skilled in some vocation. Lack of skills leads to a failure in the youth to secure the job of their dreams. There is a greater demand for skilled workers than knowledgeable students. It becomes indispensable that the pedagogy emphasizes skill development for students that prepare them for their future careers. It is high time we should have integrated skills with education in general and higher education in specific. With the need to empower the youth by improving their job prospects, skill development has become an essential aspect of education. The National Education Policy (NEP) 2020 has emphasized vocational education through integration with general education which will help students in acquiring various skills to meet the needs of the industries and to improve the quality of education. Skill development not only helps individual students but also the community as a whole to create a better world.

IBM's global higher education study report stated that 73 per cent of Indian education influential said that innovative technologies are distracting higher education. In India, an outworn curriculum is challenging higher education levels to equip graduates with job-ready skill sets. Both advanced technologies and techniques are entailed to improve this scenario and make ready these graduates to swiftly fit into the real-world work environment. This can be done through changes in higher education, and importantly, by focusing on integrating skills with education and by introducing experience-based and practical learning experiences in higher education. Adding more flexible, purpose-driven, realistic, functional, practice-based learning and creating deeper relationships with the real-world business and technology ecosystem are the important recommendations for bridging the skill gap in India depicted in the study. For any country, its students are the human capital and it is essential to empower them for the development of the economy.

As per the eighth edition of the India Skills Report (ISR), less than half of the Indian graduates are employable due to a lack of professional skill sets. The report stated in 2021, nearly 45.9 per cent of graduates are found employable, a decline from 46.21 per cent in 2020 and 47.38 per cent in 2019. India has a large population of unemployable youth in the current scenario. Mostly, industries complain about the lack of practical training by the universities during UG and PG programs. The academia claims that non-cooperation by the industry for students' internships and project works and in all the country bears the brunt of that. Speedily after 2010, the Indian economy has shown massive growth prospects with entrepreneurship development in India. But the threat of a skill gap is a foremost roadblock to this growth in India.

For the sound economic development of any economy, skill-based learning and training is an integral component of increasing efficiency and productivity. In India, it's still at a nascent stage. However, the demand for skilled manpower is extreme, and to cover this gap, it is very advisable to re-engineer the skill ecosystem. Skill-based learning in schools and colleges can increase employability through a series of inputs to equip students with appropriate hands-on skills, which helps them to be job-ready. It can also uplift confidence, and enhance the productivity, and competency of individuals through focused outcome-based learning.

The Need for Integrating Skills with Higher Education

Higher education involves the pursuit of advanced learning, which is often made available by universities and specialized institutions. Generally, higher education includes advanced levels of certification along with knowledge and practical skills needed to pursue a chosen career. The higher education landscape is facing a revolution brought about by the incorporation of various new skills into degree

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programs. Skills, such as entrepreneurship, creativity, and communication, are becoming increasingly important in the job market. As such, universities and colleges across the globe are adapting to the changing needs of their students through initiatives that focus on integrative skill-based learning. As the demand for skilled labor continues to grow through technological advancements, employers increasingly require employees who possess more than just bookish knowledge; it is essential that candidates have strong work-specific skills in addition to general business abilities. Integrating skill with higher education refers to the process of combining knowledge acquired from formal educational training within an academic setting with appropriate industry-specific work practices and requirements necessary for one's intended career field or speciality area. Through this incorporation and enrichment of current subject matter, graduates become prepared for further study, future job opportunities, as well as a longer-term professional success within their chosen field. With this combination, students gain pertinent technical background knowledge while also reinforcing concepts related to their major field of study through hands-on experience.

In an article by Ferri, Dixit and Metcalfe (2017), entitled, 'The Need for Skill Integration in Higher Education' published in the Journal of Further and Higher Education, the authors investigate the need for university curriculums to become more focused on developing key transferrable skills in students. Their research emphasizes the fact that employers today "prioritize candidates who possess employable skills necessary to succeed in a competitive labour market." In other words, college graduates must be adequately equipped with practical abilities, like effective problem-solving or creative thinking abilities, if they wish to remain competitive in the job force and find career success beyond their academic years. To address this issue and demonstrate to employers that university students possess aptitude beyond simply traditional subject knowledge, educational institutions must start placing an emphasis on "integrated skill sets" through dedicated courses during their undergraduate and postgraduate studies. This would grant students the opportunity to learn various sets of skills simultaneously-thereby providing them with more flexibility for their future endeavours outside academia.

Integrating vocational expertise with higher education can provide individuals with many benefits such as improved employment prospects, enhanced personal marketability, greater access to resources and additional financial stability potential. Generally speaking, employers today seek well-rounded candidates, particularly those who possess soft skills such as communication proficiency in addition to technical qualifications related to specified job standards or requirements outlined by particular industries respectively. Employees are better positioned when they have obtained corresponding certifications illustrating clearly their command in applicable areas or fields beyond a college curriculum possibly extending into further specializations if available at a given institution thus widening educational experience. In other words, lifelong learning opportunities granted via specific pieces of training taken over course of one's studies may benefit in the form of increased credentials proving advantageous during their employability prospects leading them toward desired positions. This practical experience gained over lifelong learning opportunities also equips them with the best tools for a given marketplace advantaging them over competitors.

Universities across the globe have begun structuring courses around practical skills instead of traditional course topics—allowing both undergraduates and postgraduates access to training for experiences otherwise unattainable due to a lack of resources or faculty expertise within each individual institution. For example, many schools have started introducing courses focusing on entrepreneurial competencies including business strategy formulation so that participating students can gain insights into running successful businesses while still attending university. Similarly tailored coursework has also been developed at Stanford University's Graduate School of Business which focuses specifically on creativity (Rinderman et al., 2018). Here students obtain exposure to unorthodox methods of problem-solving backed up with academic rigour so they can understand how innovative breakthroughs are determined or created by successful businesses today-providing them an edge upon graduating from the university before ever stepping foot inside a corporate workplace setting.

Furthermore, these same skills become immensely beneficial when pursuing topics such as creative content creation or user experience design-areas commonly sought out by tech companies

seeking millennial staff members who understand user demands better than any experienced technician could manage alone. Identifying such intangibles will eventually be instrumental when searching for meaningful employment over field-specific expertise within certain industries open only to those capable of demonstrating creativity & strategy development proficiency alongside technical know-how already supplied via classroom lectures. It is high time that higher education institutions must have integrated skills with their curriculum to better equip graduates for success after graduation.

Integration of Skills with Higher Education in Andhra Pradesh

With a vision to transform the students into an employable workforce, the government of Andhra Pradesh revised the curriculum of UG professional and conventional degree programs with much emphasis on skilling and practical experience. The redesigned curriculum in engineering programs, and BA, B.Sc., B. Com, and other graduate programs were introduced in the Academic Year 2020-21. For the first time, an outcome-based curriculum was introduced with Life Skill Courses, Skill Development Courses, and Skill Enhancement Courses right from the first semester. 30% of skill courses were introduced in the revised curriculum. AP developed content, video lessons and podcasts for all seven Life Skill and Skill Development Courses. AP also introduced 67 B.Voc courses and 25 market-oriented courses. In fact, Andhra Pradesh is the first state to implement major components of NEP 2020 while other states were still discussing its provisions. When NEP 2020 document was rolled out in August 2020, Andhra Pradesh has already incorporated the provisions and implemented the curriculum in July 2020.

The Government of Andhra Pradesh introduced a mandatory 10-month internship for all the UG students in the revised curriculum including a 2-months Community Service Project. For the first time in the country, our state government has taken complete responsibility for providing internships to students. In this regard, the government appointed a state-level committee with the Chief Secretary as Chairman and 12 Principal Secretaries of various departments as the members and District Level Committees under the Chairmanship of District Collectors to implement the internships effectively. The government developed an 'Industry - Institute Connect' (IIC) web portal on the Learning Management System (LMS) platform to map the industries and their apprenticeship and internship requirements with the students of Andhra Pradesh. Already 10 lakh students have enrolled on this 'Single Sign-on Portal'. 1,95,245 students from UG Conventional Programs like B.A., B.Sc., B.Com., BBA etc. completed their short-term internship in different sectors like Financial Services, Agriculture, Retail, Textiles & Apparel, Life Sciences & Pharma, Software & IT, Tourism & Hospitality, Electronics, Renewable Energy, Healthcare, Telecom, Transport, Passport & Warehousing, etc. Out of 1,95,245 students, 90,777 students completed virtual internships and 1,04,468 students completed physical internships.

Community Service Project (CSP) is an experiential learning strategy that integrates meaningful community service with instruction, participation, learning, and community development. It shall bridge the gap among the community, students, and HEIs. The community will be benefited from the focused contribution of the students to the village/ local development. In turn, this initiative will hone the life skills of the students and advance their careers, and HEIs find an opportunity to develop social sensibility and responsibility. Through this CSP, AP intends to transform the students into empathetic citizens with responsibility towards their fellow beings and the HEIs into socially responsible institutions. The government of Andhra Pradesh is partnering with UNICEF to implement the CSP in the state benefiting both the students and the communities. All the 2.1 lakh students of the AY 2020-21 batch have completed their Community Service Project (CSP). 1.6 lakh students out of 2.25 lakh students of the AY 2021-22 batch have completed their CSP and the rest are expected to complete it by March 2023.

The government is working with the Quess Group, Launch Pad, Team Lease, and Employment Express to identify about 10,000 physical internships. The government is entering MoUs with many reputed MNCs to provide internships and placements. From the next year, AP is all set to provide internships to 3.5 lakh students in the state.

For the first time in the country, a state government entered an MoU with Microsoft for an Upskilling Program. Through this program, 1.62 lakh students are trained in 40 skills for getting Microsoft Certification. The government is spending

around Rs.32 crores. It is completely free of cost to the students. 83,100 students have completed certifications so far. By the end of March 2023, all the 1.62 lakh students will complete the certifications and be ready for getting suitable employment. Students from HEIs in AP have completed 1,75,000 virtual internships in corporate giants and MNCs like Microsoft, Salesforce, AWS, NASSCOM, Palo Alto, Blue Prism, Celonis, Full Stack BFSI& BD. Out of these virtual internships offered, 72,000 students have simultaneously completed certifications in emerging technologies. Andhra Pradesh is the only state in the country to achieve more than 1.55 lakh certifications in a calendar year (MS certifications & Virtual Internship certifications).

Strategies for Integrating Skills into Indian Higher Education Curriculum

Develop a Skills Framework

Indian higher education institutions should develop a skills framework that identifies the skills that are essential for success in the modern workplace. This can be done through stakeholder engagement, such as surveys and focus groups with employers, alumni, and students. The skills framework should be used to guide the development of the curriculum and assessment practices. In the curriculum of UG conventional and engineering programs of the State of Andhra Pradesh, this strategy was followed.

Embed Skills into Courses

Indian higher education institutions should embed the development of skills into existing courses. For example, courses can be designed to promote critical thinking, problem-solving, and communication skills. Several such courses are incorporated into the curriculum framework of the revised choice-based credit system of the State of Andhra Pradesh. Courses focusing on Life Skills, Skill Development and Skill Enhancement courses are being offered. Faculty members should be encouraged to incorporate the development of skills into their teaching practices.

Provide Experiential Learning Opportunities

Experiential learning opportunities, such as internships, co-op programs, and service learning, can help Indian higher education students develop skills such as teamwork, leadership, and cultural competence. A mandatory 10-month internship is introduced for all UG programs in the State of Andhra Pradesh. Such internships shall be provided to students across all higher education institutions and ensure that they are integrated into the curriculum.

Use Competency-based Education

Competency-based education is an approach that focuses on the mastery of specific skills and competencies rather than the completion of courses or credits. This approach can be used to ensure that Indian higher education students develop the skills required for success in the modern workplace.

Assess Skill Development

Indian higher education institutions should assess student skill development using a range of assessment tools, such as rubrics and self-assessment. The assessment data can be used to identify areas where improvements are needed and inform curriculum development.

Collaboration with Industry

Indian higher education institutions should collaborate with the industry to identify the skills required by employers and ensure that the curriculum is aligned with industry needs. This collaboration can also provide students with access to industry experts, internships, and job opportunities. The AP State Council of Higher Education has inked MoUs with Microsoft, Salesforce, AWS, NASSCOM, Palo Alto, Blue Prism, Celonis, Full Stack BFSI& BD, etc., for ensuring the job readiness of graduates, by skilling them in industry-required micro-credentials offered by these industrial houses.

Conclusion

According to McKinsey, around 69% of companies globally are focusing on skill-building and more than 50% believe that the pandemic and the challenges it threw up have increased the demand for a multi-skilled workforce. According to an Accenture report titled Fueling India's skill (R)evolution, the country could lose 2.3% of its annual growth by 2028 if skill-building is not on par with modern technological interventions. While our Higher Education System is currently undergoing several changes, the growing need for seamless coordination of a classroom-based curriculum and practical skills-based learning demands that our institutions and academicians begin designing a different kind of curriculum that focuses

on research, development, and training. A strong collaboration with the industry to impart skilled courses to students will be essential. HEIs must bring in experts from the industry to their laboratories so that students are aware of the developments on the ground. Regular seminars and classes and internships and on-the-job training/ live projects are also excellent ways to learn the industry's inner workings. Over time, this will allow academia to update existing learnings with newer methodologies and ensure an advanced pedagogy.

Considering it as a need of the hour, industry, educational institutions, and government must join hands to create a holistic eco-system where skills can be developed, nurtured, and honed.

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The Association of Indian Universities

The Association of Indian Universities (AIU), is one of the premier apex higher education institutions of the Country established in 1925. It is a research-based policy advice institution to the Government of India in the field of Higher Education, Sports, and Culture. Since its inception, it has been playing a vital role in shaping Indian higher education. Most importantly, AIU is vested with the power of according equivalence to Degrees/ Qualifications offered by the universities across the world with those offered in India. AIU has also been mandated by the Department of School Education, Ministry of Education, Government of India to accord equivalence to the Indian Boards for the Secondary/Senior Secondary Examination vide Gazette Notification. AIU is a think tank body with the responsibility of undertaking academic activities such as: conducting Research Studies in higher education; acting as the bureau of information on higher education; liaising with international bodies and universities for the internationalisation of Indian higher education among many others. AIU conducts inter-university sports and cultural events at national and international levels. As a National Sports Promotion Organization (NSPO) it promotes sports among Member-Universities and maintains the standards in sports.

Being an apex advisory institution, it constitutes an integral part of all major decision-making committees and commissions in the country. As a representative body of Indian universities, it facilitates cooperation and coordination among Indian universities and liaises between the universities and the Government (Central as well as the State Governments) and also National and International bodies of higher education in other countries in matters of common interest. Whereas all the Indian universities benefit from its contribution, at present it has a membership of about 898 universities including 14 overseas universities from other countries viz. Bhutan, UAE, Kazakhstan, Mauritius, Malaysia Nepal, as Associate Members.

Some of the legends among many, who served AIU as its Presidents are Dr. Sarvepalli Radhakrishnan, Dr Zakir Hussain, Dr. Syama Prasad Mukherjee, Dr K L Shrimali A.L Mudaliar, Dr Akbar Hydary, Prof A C Woolner, Pandit Amarnath Jha, Sir Maurice Gwyer, Dr K L Shrimali, Prof Shiv Mangal Singh 'Suman', Prof M S Gore, Prof M S Adiseshiah, Prof M S Valiathan.

Integrating Skills in Higher Education: Pathways for Institutional Commitment to Policies

Neeta Inamdar*, Praveen Shetty and M D Venkatesh*****

The purpose of the education system is to develop good human beings capable of rational thought and action, possessing compassion and empathy, courage and resilience, scientific temper, and creative imagination with sound ethical moorings and values.

(National Educational Policy--- 2020).

There is something intriguing about India's envisioning of the future of education in NEP-- 2020 and the global insistence on the need to integrate skills in Higher Education. Not that the insistence on preparing a generation to meet the demands of a rapidly evolving technological world has lost its rigor in this conception. Contrarily, it is acknowledged to the hilt. Yet that concern occupies only a part of the larger idea-the idea of an education that can fuse idealism and pragmatism, material and spiritual, and specific and universal with natural ease.

Certainly, the debates surrounding the need and mode of integrating skills in Higher Education in India call historical understanding of the conception of education in India. This historical understanding, akin to T S Eliot's notion of 'historical sense', demands not only a sense of the future but also a sense of the past, for the present of India is at once a combination of its past and future. Maybe the complexity or the simplicity of this Indian conception of education that believes, to quote Eliot again, "time present and time past are both perhaps present in time future" (Eliot, T. S. 1971) is what makes the case of India truly distinct in the world of global higher education.

The concerns surrounding the need to integrate education with practical skills whether technical or humane are not new to India. Sarvepalli Radhakrishnan's erudite detailing on the philosophy of education that promotes balanced growth of the individual through knowledge and wisdom, and Gandhi's plea for the growth of a sustained community through a form of education that enables the self-development of individuals, championed the case of integrating skills with education at the very dawn of India's emergence as an independent nation (*To All Education*, 2022). The urgency with which the world now is opening itself to the idea of skill integration among higher education institutions needs to be examined within this ambit of recognizing 'knowledge' and 'skill' as inseparable and inviolable driving forces of education.

As the necessity to equip graduates with the skills they need to succeed in the industry becomes more widely recognized, integrating skills into higher education has become a trend in many nations throughout the world. Rapid technological advancements in fields like artificial intelligence, bioengineering, and digital operations have led to a growing belief that integrating skilling into higher education can help close the skills gap between what students learn in the classroom and what companies need. The argument in favour of skilling points out that graduates develop the creativity and problem-solving skills needed to innovate and create new products and services when there is integration. It is clear that incorporating skills into higher education may benefit people, the economy, and society at large. It can assist students in developing the abilities required for employment success, closing the skills gap, fostering creativity, and dealing with societal issues.

Understanding the Need to Integrate the Skills in Education

The skills gap in education is a global issue that has surfaced as one of the important areas of concern for the future of the world economy. It refers to the mismatch between the skills that employers require and the skills that the workforce possesses. Owing to technological improvements, globalisation, and shifting economic objectives, the demand for skills is changing rapidly. As a result, it might be difficult for many firms to recruit employees with the necessary abilities.

Research in the field has shown interesting insights about the type of skills required from the employees. For instance, a survey with 750 hiring managers in the United States by Salesforce Research revealed that 59

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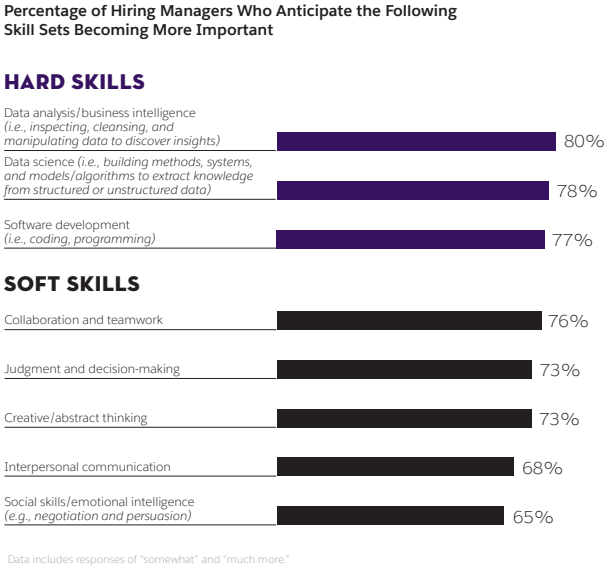
percent felt that AI will have an impact on the kind of skills the companies would expect from the employees. The figure-1 provides a glimpse of the expectations of the skills required.

Figure-1 Skills Required for Employability in 21st Century



Source:https://www.salesforce.com/content/dam/web/en_us/www/documents/research/market/future-of-workforce-development-salesforce-research.pdf

Technical skills, such as coding and data analysis, and soft skills, such as communication, teamwork, collaboration, and emotional intelligence would be the sought-after skills. It becomes a necessity to develop a framework to inculcate these skills among students across disciplines. Further, it has been observed that the present model of education is not completely equipped to address the above issues. A study indicated that by 2030, in the US talent shortage and skill gap will result in a loss of $8.5 trillion. Also, it is estimated that by 2030, China may face a talent shortage of 12 million workers and Japan's 18 million workers (PWC, 2020).

The issue pertaining to the skills gap seems to become more pronounced in the case of developing countries as they also grapple with the issue of quality education and access to quality education among all. For instance, ManGroup's Report of Talent Shortage 2020, indicated that 63% of companies in India report a shortage of employable individuals in IT, Engineering, and Sales, only 2.5 percent engineers in India are reported to be equipped with quality AI skills, only 40 percent of graduates are able to opt for internships (Economic Times, 2022). These issues have brought a new level of awareness and corroborated the view that there is a stronger need to integrate skills in Higher Education.

Efforts to Integrate Skills in Education Across the World

Depending on the priorities, context, and needs of each nation, there are differences in how skills are integrated into higher education around the world. In Europe, the European Union (EU) has been promoting the integration of skills development in higher education through various initiatives. The European Qualifications Framework (EQF) is established to recognise the learning qualifications across Europe. Along with initiatives such as Bologna process, Erasmus programs, EQF has helped the higher education sector to make higher education qualifications are comparable and transparent across Europe ((*European Qualifications Framework (EQF)*, 2023). Alongside this, the EU announced New Skills Agenda which builds on the 2016 Skills Agenda to strengthen sustainable competitiveness and provide access to education, training, and lifelong learning.

Further, in June 2022, the Council of the European Union adopted a "Recommendation on a European approach to micro-credentials for lifelong learning and employability" (A European Approach to Micro-credentials, n.d). The recommendation aims to facilitate the creation, adoption, and acceptance of micro-credentials across institutions, corporations, industries, and national boundaries. These micro-credentials certify the learning outcomes of short-term learning experiences, for example, a short course or training. "They provide a flexible, focused method of assisting individuals in acquiring the competencies, information, and skills essential to their personal and professional growth" (*A European Approach to Micro-credentials*, n.d.). These micro-credentials open up the possibilities of interesting skill-based learning opportunities that are different from the traditional qualifications. In response to the need for more adaptable, learner-centered types of education and training, a wide range of public and private organisations are offering these options (*A European Approach to Micro-credentials*, n.d.). These could be an interesting option to explore for organisations involved in education in other parts of the world.

The focus on integrating skill development in higher education is emphasised strongly in the curriculum and practices in the United States. Many institutes, with an increased emphasis on industry collaboration and internships, promote courses and programs that emphasise practical skills like entrepreneurship, digital marketing, and data analytics. These trends in education are followed by educational institutes across the globe with increased efforts to create a standardized skill framework that is globally acceptable. For instance, the *SkillsFuture* initiative in Singapore attempts to enhance the skill set of Singaporeans through a programme accessible easily to the students (*SSG AboutSkillsFuture*, n.d.). Overall, across the world, it could be observed that these attempts to integrate skilling in education focus on the development of new curricula, providing opportunities for experiential learning, and enhancing industry-academia collaboration.

India and the Integration of Skills in Higher education

The skills gap scenario in Indian Higher Education is multifaceted in nature and requires a nuanced approach. A number of issues combine to make it case complicated here. Lack of understanding of the requirement of the industry in framing the curricula, the gap or absence of industry-academia collaboration, misconstrued notions about vocational education, lack of options related to recognition of non-conventional learning, and above all failure to internalize the spirit of educational philosophy among the stakeholders involved have been the major constraints for several years in India.

However, concerted efforts from the government through a number of visionary initiatives and active participation of non-governmental entities are strengthening these initiatives and they have begun to make a gradual change in the educational paradigm. One of the prominent initiatives introduced by the Government of India, the National Skills Qualifications Framework (NSQF) is primarily aimed at integrating skills with education. This quality assurance framework aligns the competencies of vocational education and training with the needs of the industry (*NSQF) ||Department of Technical Education Training and Skill Development*, n.d.). It provides a standardized system for recognition, validation, and certification of skills acquired by students. Further, initiatives such as *The Skill India Mission and* Pradhan Mantri Kaushal Vikas Yojana (PMKVY) help the youth to obtain certifications and take an active part in developing entrepreneurial activities. The government scheme named National Apprenticeship Promotion Scheme (NAPS) is an attempt to bridge the gap between industry and academia by incentivising apprenticeship. It helps the individuals to gain hands-on training in the select domains and make the students industry ready.

The other interesting initiative that has transformed the quality of education in India, *Rashtriya Uchchatar Shiksha Abhiyan* (RUSA), is directly connected with the notion of skill integration. This scheme provides funding to higher education institutions for infrastructure development, faculty recruitment, and curriculum development and equips these institutions to promote skill development among students through quality education.

Apart from initiatives by the government, there are also non-governmental organizations, and private players who are actively engaged in skill development. Though National Skill Development Corporation has contributed significantly, the industry-led efforts in skilling youngsters also form a part of this ecosystem. There are also some examples of public-private partnerships, and industry-academia partnerships that set new examples in this hour of need.

These interventions have helped to integrate skills in higher education in India to an extent. They have certainly addressed the challenges posed by traditional educational practices. However, the question remains to be asked-are they really in tune with the idea of education that was envisaged by India's visionary educationists of the past or adequate to fulfil hopes of India's future?

The idea of education in India is never about placing skill above knowledge or knowledge above skills. It is not about the binary opposition of one gaining prominence over the other at a given point in time. Education has been and is always aspired to be about 'becoming'. Education, as S Radhakrishnan pointed out "to be complete, must be humane and include not only training of the intellect but the refinement of the heart and the discipline of the spirit" (*To All Education*, 2022). It is in this context the idea

of a holistic approach to education that combines skills with knowledge gains importance.

Pathways for Institutional Commitment to Policies

Though the National Higher Education Qualifications Framework (NHEQF) and NSQF have been designed to align and benefit all the stakeholders in the education sector, the responsibility now lies on Higher Education Institutions (HEIs) to adopt the principles enshrined in these documents and implement them. Though it is understandable that there have been a lot of changes in the realm of education in the country since NEP- 2020, with the subsequent creation and implementation of newer frameworks, these changes herald a new beginning for the education sector at this juncture.

It is imperative that HEIs, big and small, join hands and make efforts at the institutional level in adapting these guidelines, and implement and share the responses of stakeholders to the changes made. This sharing could then feed into policymaking further by being evidence in that direction. In the next part of the paper, we present a case of the Manipal Academy of Higher Education.

Manipal Academy of Higher Education - A Case Study

Manipal Academy of Higher Education (MAHE) is an Institution of Eminence and a leading private university in India, which was one of the earliest to come out with an Institutional Development Plan in line with NEP- 2020. When NSQF was announced, MAHE leadership constituted a Committee to study NSQF and recommend how MAHE can map grades obtained in skill-based programs and recognize prior learning. This Committee was constituted as per the suggestion of IQAC in August 2022 and included faculty members from health sciences, humanities, and management sciences. It also had Deputy Registrars of health sciences and technology who called for a series of meetings to deliberate on NSQF and its requirements and submitted a report on 13 September 2022 to the Registrar, MAHE. The Committee then made a presentation to the University leadership on 07 October 2022 and revised it again based on the recommendations given by the leadership.

It can be noted that the objectives of NSQF included (a) mobility between vocation and general education by alignment of degrees with NSQF and (b) Recognition of Prior Learning (RPL), allowing transition from non-formal to organized job market. MAHE decided to contribute toward these objectives by providing opportunities to the candidates with skill-based qualifications to progress to general education programs through RPL while taking admissions to the general education programs offered by MAHE. This could be achieved by exempting the students from undergoing courses that can be mapped with their prior learning in a vocational program, recognizing a B Voc degree for admission to post-graduation programs, and providing opportunities to the candidates with a postgraduate diploma equivalent to NSQF Level 8 to have a lateral entry to the second year of master programs.

The Committee recommended that a candidate claiming RPL within three years of obtaining certification shall only be considered for the exemption or lateral entry post which he/she will have to go through a screening test to avail of this exemption. The idea here was to not compromise on the quality of general education and the graduate attributes expected at the end of the program.

As a next step, the Committee members identified a few programs where this could be implemented. The Committee also identified sector skill councils and their recommendations for recognition of skills. This involved a lot of effort but due to the concerted efforts, it was possible for them to list out a programme where this could be realised. While this was being done, it was important to align this idea with the institutional practices of making any of these changes only with the approval of the Board of Studies and then placing them before the Academic Council for final approval.

For example, the qualification pack of BFSI Sector Skill Council of India, Logistics Sector Skill Council, Management and Entrepreneurship and Professional Skills Council, and Retailers Association's Skill Council of India were reviewed in connection with the program offered by the Department of Commerce. It was observed that only the qualification pack BSC/ Q8101: Accounts Executive" of BFSI Sector Skill Council of India could be conveniently mapped with the B Com (professional) and M Com programmes

when the candidates sought admission to the program.

Similarly, media and entertainment sector skill council work were taken into account while recognizing certificate courses in graphic designing (level 4 and above), and social media (level 4 and above) were identified where exemptions could be provided. These were only a few examples whereas the Committee looked deeply into many other courses. It was important and then discussed during the Academic Council. Though a lot of work remains to be carried out in this direction, the work done so far has set the tone.

Apart from this rigorous academic exercise of going through sector skill councils and their course content and mapping it with learning outcomes within the programs offered, MAHE also called for a continued internal discussion about RPL. If this was about MAHE's commitment to the newly emerging policies, it was simultaneously connecting with the local government-supported skill development Centre.

Continuing with its commitment to local community engagements, MAHE now extends technical support to *Grameena Bantara Sangha* Skill Development Centre, *Moodubelle* where some of the faculty members of the institution regularly conduct workshops and assist young rural men and women to meet the requirements of the labour market. Thus, it is important for educational institutions to approach skill development with a multi-pronged approach. The first one is integrating skill development within the program design and delivery and the second, by recognizing prior learning in the skill sector and facilitating general education to those with skills qualifications. The third, most important exercise is to connect with local NGOs and governmental initiatives that are into skill development and join hands in the skill development of youth in the region around.

It is important to embark on this journey of empowering youth as they shape the future of the country. Their participation in the labour market as important players would enable realization of their full potential apart from contributing to economic development. Skill and knowledge have to go hand-in-hand to make education meaningful. If knowledge is about making sense of the world around oneself, skill is a means to engage with the same world. It is, therefore, a balance that needs to be achieved between knowledge and skill. Higher education institutions through their educational programs should endeavour in meeting both these requirements with a fine balance.

It is heartening to see there are policy interventions to make this happen today along with many programs like Skilling India. It is now time, HEIs to respond to these changes and make concerted efforts at meeting the collective goals set for the nation. It is time to learn from each other and share best practices for integrating skills in higher education.

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The Role of Higher Education Teachers: National Education Policy–2020 Context

Marmar Mukhopadhyay*

The role of the teacher has been a popular theme of educational discourse since time immemorial. The teacher was the only source of knowledge until the script was presumably discovered in Mesopotamia in 3200 BC, and Gutenberg's printing machine was invented in 1450 for commercial printing.

The reference points of role description and analysis of higher education teachers are the concept and theory of higher education and the idea of the university. The concept, nature and purpose of higher education can be found in the history of education in several countries like ancient India, Greece, Mesopotamia, and China. The scriptures and scholar-philosophers, like Upanishads (especially Taittiriya Upanishad) Plato, Confucius, and others during ancient times; Martin Carnoy, Herbart Marcuse, Sri Aurobindo, Swami Vivekananda, Rabindranath Thakur, John Dewey, Albert Einstein, Nietzsche, Bertrand Russel, Max Muller, Philip Altbach, and others in modern times made important statements and contributions. Brubacher (1970), a passionate scholar of higher education philosophy and theory, raised some crucial issues on the way to building a theory of higher education. A few of the critical issues are:

- Higher education for whom – for meritorious or all?
- Whether higher education is a right or a privilege? If it's a right, whose responsibility is it to provide the opportunity for higher education?
- Can all postsecondary education be called higher education? Or, Can higher education be classified into *Lower* and *Higher* higher education? What would be the difference between lower higher education and higher higher education?
- Is higher education for developing earning generation skills or pursuing higher intellectual endeavours?
- What is the nature of opportunity of higher education – to be linked to workforce demand, employability, talent, or for all? Should the opportunity of higher education be equal *vs* equitable according to the quality of talent?

Several other issues are emerging out of contemporary research. Whether higher education is for improving the knowledge that is unlikely to remain valid for long or for improving cognitive prowess or conceptual complexity? With increasing globalisation, demographic changes in industrialised countries, and student and job aspirant migration, whether higher education needs to be remodelled for global citizenship and the world as one community (learning to live together)? How to achieve the opportunity-equitability of talented students from low-income families, mediocre from wealthy families, or meritorious students from non-meritorious parents and vice-versa?

Answering these and many other questions would shape higher education teachers' role descriptions and definitions. A reflection on the role of Indian higher education teachers becomes relevant at this point when Indian higher education faces a transformative agenda through the implementation of the National Education Policy -2020(NEP—2020).

NEP–2020

The NEP---2020 reiterated the centrality of the role of teachers: "The teacher must be at the centre of the fundamental reforms in the education system. The new education policy must help re-establish teachers, at all levels, as the most respected and essential members of our society because they truly shape our next generation of citizens. It must do everything to empower teachers and help them to do their job as effectively as possible (NEP2020, p4). NEP2020 asserts that quality higher education must aim to develop good, thoughtful, well-rounded, and creative individuals. In article 10.3, NEP attempts to define "a university will mean a multidisciplinary institution of higher learning that offers undergraduate and graduate programmes, with *high-quality teaching, research, and community engagement*. The university's definition will thus allow a spectrum of institutions that range from those that place equal emphasis…" differentiating Research-intensive Universities from Teaching-intensive Universities. The idea of a university in NEP2020 is more functional than metaphysical.

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Articles 23 and 24 of the NEP–2020 focus on transforming higher education into ODL and an online, blended higher education system. The obvious implication is the introduction and implementation of blended learning. Though 'blended learning' finds mentioned under several sections and pages of the NEP–2020 document, the adoption of blended learning in higher education is more by implication.

Indian higher education serves about 41.4 million (little more than 27% of) young people of the concerned age group through more than 1113 universities and 43,796 colleges (AISHE data 2020-21). Of the 41.4 million students, 11% or about 4.4 million, are registered in open and distance learning institutions. Formal or conventional colleges and universities cater to the educational needs of 89% or approximately 36 million students. The UGC has allowed up to 40% of courses to be taken online. This implies that more than 60% of courses will be covered face-to-face. The choice of technology-integrated education for this large majority of students - more than 80% in undergraduate courses and most rural areas, falls on classroom-based flipped, hybrid, and blended learning. Blended learning can be used as a generic mode, subsuming hybrid and flipped learning.

Because of this massive challenge of technology-integrated smart education for nearly 36 million higher education students, the Association of Indian Universities, in collaboration with the Commonwealth Educational Media Centre for Asia, New Delhi, the regional outfit of the Commonwealth of Learning, has taken the initiative in drafting a National Policy on Blended Learning in Higher Education.

Blended Learning

Blended learning has been conveniently, and probably simplistically, defined as the blending of online and offline (or face-to-face) learning modes. Six different blended learning models have described the degree or proportion and methods of online and offline blending (Box-1). The two ends of the blended learning models are the face-to-face and online driver models. For the 36 million students, choosing a model that suits the situation where the students study in urban or rural institutions, dispersed locations, or reasonably populated habitations is necessary.

The success of the online driver model depends significantly, almost exclusively, on broadband internet connectivity. There is a wide divergence in the data about the percentage of the population with internet connectivity. According to Statista, "as of June 2022, the number of rural internet subscribers was over 339 million in India"[1]. In India, Cisco (undated) predicted 840 million Internet users in 2022. Internet connectivity is either unavailable or miserably poor in India's large rural space that provides the largest proportion of higher education students. Thus, internet connectivity is the biggest challenge to implementing the online component of higher education. I do not include access to technology devices because my exploration and survey indicate that many higher education students, even in rural areas, have access to digital devices, particularly Android phones. The bane is stable internet connectivity.

Thus, the implementability of UGC's circular for opting for up to 40% of online courses, despite a substantial reserve of OER learning material on SWAYAM and other complementary platforms, depends upon the stable broadband Internet connectivity. Notably, Internet connectivity is not in the domain of the Ministry of Education of the Government of India.

Until stable broadband Internet connectivity becomes inclusive of rural areas and dispersed population locations, the dominant blended learning model will likely be face to face driver model. The face-to-face driver model will demand blending with offline digital media to compensate lack of internet connectivity.

The face-to-face mode has often been wrongly equated with lectures only. There are at least 50 plus learning tactics in the face-to-face mode (Mukhopadhyay, 2022). It is necessary to understand that blended learning is not just the blending of online or offline. It also means blending learning tactics emanating from different schools of the psychology of learning. For example, the lecture and direct instruction in technical terms is the contribution of the cognitivist school. Group-based exploration, problem-based learning, desktop research, online and offline peer consultations, constructing artefacts, etc., are derived from constructivist, connectivist, and constructionist schools of the psychology of learning.

The research evidence indicates that the most commonly used conventional lectures are the least effective in impacting students' learning outcomes. Using PowerPoint slides improves communication, engagement and learning outcomes marginally because

Box -1: Blended Learning Models

BLENDED LEARNING MODELS

Face-to-Face Driver Model

As the name suggests, this model is like a traditional pedagogical structure. Classrooms are diverse, and students' ability levels vary. It provides appropriate challenges to capable students, while those with low capabilities are given remedial skills to accelerate their learning. It blends lectures with remedial learning techniques like tutorials and counselling.

The Rotation Model

Under this blended learning model, students have a set timetable and learn from their teachers' face-to-face teaching. Later they move to online learning. This model is being used at all levels of education. The rotational model has been classified into station rotation, lab rotation, flipped classroom, and individual rotation.

The Flex Model

The flex model is usually adopted by institutions supporting "non-traditional and at-risk students' education. In this model, learning material is delivered online to the learners. The teachers or tutors are available for individual consultations and mentoring in their respective rooms. This reversal of the conventional mode (flipped learning) shifts the onus and initiative of learning to students; teachers work as facilitators and counsellors besides designing and/or curating online learning material. The enriched virtual model is very similar to the flex model.

Online Lab School Model

This is the primary online delivery of an entire course. Students can take/complete a course they might have missed in the institution. Students can visit the computer lab for completing their course work and assignments if such facilities are not easily available at home. In this mode, institutions can offer courses where there are no teachers and teaching is done under the supervision of some adults.

Self-Blend Model

In this model, students create their own blending. They attend classes other than what is provided in the institution's timetable. They complement and enrich face-to-face learning with self-chosen online courses from remote sources and learning in peer groups. Students usually adopt this model with initiative and motivation to achieve higher grades. This model also helps students learn subjects outside the given course catalogue and structure. The self-blend model is very similar to the a la carte model.

The Online Driver Model

This is the opposite of a traditional face-to-face instructional environment. In this model, students receive learning material online and engage in chats with teachers online, although face-to-face interactive opportunities may also be available. This model is useful, especially for students who need more flexibility and take responsibility for their learning.

the lecture becomes structured. Research shows that even without technology-aided structuring, students learned better from structured lectures/presentations than from random unstructured lecturing.

With or without technology-integrated, a structured lecture is teacher-centric. Conversely, the online driver model of blended learning is dominantly student-centric. The purpose and process of blended learning are shifting the onus from teaching by teachers to learning by learners. This shift of the onus of learning enhances individuation, personalisation, and engagement. Blended learning warrants using learning tactics embedded in Constructivism, Constructionism, and Connectivism. Self-regulated learning becomes the common core of learning tactics chosen from different schools as the onus shifts to learners. As students take the onus of learning, their engagement and learning outcomes improve. This demands a change in teachers' roles in higher education.

Role of Higher Education Teachers

Role definition, role analysis and role effectiveness are the three issues. Role effectiveness is the function of relevant knowledge, skills, and attitudes. Before we

dive deep into the role specification of HE teachers in the context of NEP2020, and more specifically in the context of the concept of university, and the academic framework, including the structure of the curriculum, instructional systems and learning assessment, we may reflect on the most generic time tested role of a teacher. The three classical roles of teachers are:

1. They communicate knowledge.
2. They influence and shape the thought process.
3. They inspire students to evolve as a self-regulated lifelong learner for self-actualisation and social service.

A vast majority of the teachers communicate information. Very few teachers influence, and still fewer inspire. With technological developments and their fast absorption in education, teachers stand challenged as communicators of knowledge alone. Technology, as of now, has a limited role in influencing, still less in inspiring. Teachers' knowledge and critical thinking probably influence students. What inspires is wisdom. In Bertrand Russell's (1959) expression, "But what, you will ask, do you mean by "wisdom"? I am not prepared with a neat definition. But I will do my best to convey what I think the word can mean. It is a word concerned partly with knowledge and partly with feeling. It should denote a certain intimate union of knowledge with the apprehension of human destiny and the purposes of life. It requires a certain breadth of vision, which is hardly possible without considerable knowledge. But it demands, also, a breadth of feeling, a certain kind of universality of sympathy." Russell further argued that 'higher education should do what is possible to promote knowledge and wisdom'. He explained that wisdom should be something the owner is unaware of and gets conveyed to students without intention. I guess it is the behaviour, especially the affective behaviour of teachers, that inspires students. We experience many such incidences in life without recognising the wisdom component (Box -2).

Till the advent of technology, especially the Worldwide Web and the Internet, teachers and textbooks were the only learning resources for students. The WWW today contains several billion pages of materials that are going through continuous qualitative and quantitative enrichment by millions of scholars and websites. Internet penetration is steadily increasing. Accessible mobile and handheld digital devices are becoming more powerful and affordable. Search engines are getting more power by the day. Chatbots like Chatgpt, Bard, and Bing are going further than search engines and creating solutions for students' enquiries and teacher preparedness[2]. Young learners enjoy the advantage of attitude and skills in digital divide discourse over their teachers. Teachers stand challenged. An important role of the teacher is to remain valid and practise resilience. Teachers must shred the 'learned' mode to adopt the learning mode. To maintain their lead in instructional or learning leadership roles, teachers must put on the advanced learner hat – *acharya purba rupam, antewasi uttararupam, vidya sandhi*. Learning is the conjunction of the advanced learner in the teacher and the following learner in the students.

Bertrand Russell wrote, "all who are engaged in university teaching … must, of course, be proficient in some special skill. But, in addition to this, there is a general outlook that it is their duty to put before those whom they are instructing. They should exemplify the value of intellect and of the search for knowledge. They should make it clear that what at any time passes for knowledge may be erroneous. They should inculcate an undogmatic temper, a temper of continual search and not of comfortable certainty. They should try to create an awareness of the world as a whole and not only of what is near in space and time (Russell 1959[3])." The response to the challenge should usher teachers into the new role as co-learner or cocreators. In this role, teachers, instead of guiding students, team up with students on the capstone, research projects, collaborative writing, and various activities. They jointly create new knowledge and learn mutually from each other. Paulo Freire and Bud Hall's works are worth referring to.

"… the aim must be the training of independently acting and thinking individuals, who, however, see in the service of the community their highest life problems (Albert Einstein 1936 p2[4]) . The realisation of the vision of NEP2020 will largely depend upon the success of developing thinking minds among higher education students. Conventional lectures must be replaced by methods of acquiring, deepening, and creating knowledge to achieve the goal of 'training the minds to think.'

As the curricular framework changes to accommodate the realisation of the vision of NEP2020, the demand for teachers' knowledge, skills, and attitudes changes. There will be a paradigm shift in teachers' skills and roles as students take to self-regulated learning in groups with access to different

Box-2 Wisdom Vs Knowledge

When I was pursuing my post-graduate studies in the university, the head of the department and dean of the faculty was to teach us two classics in education – Plato's Republic and Rousseau's Emile. He used to teach these classics in the classic Indian Gurukul style of discourse. He could complete Emile, but not Plato. We approached him for special classes to complete the course. He listened carefully, then advised us to meet at his home from 3 to 6 pm. Being on several university committees and other assignments, there was no space for special classes in the university departments. He also instructed us to meet at 2.30 but would teach us from 3 to 6. Naturally, we thought this was a case of private tuition and were worried about the cost.

Very next Sunday, we, about 10 of us, met sharply at 2.30 at his home. We were ushered into a room spread with cushioned cotton spread covered with spotless white sheets. We recognised the place earmarked for him with three pillow cushions arranged in U-shape. A young man came with some servings for all of us. Each plate contained high-quality pieces of mango, sweets, and a cup of hot milk. The young man politely asked us to finish the snacks before the Professor enters the room sharp at 3. We diligently cleaned the plates and cups; the young man cleared them all.

Our professor entered, sat down at his designated place, and started teaching. He will read out a few sentences or a paragraph, then explain and paraphrase for us with ample scope and positive ambience for us to raise questions. Twelve weeks, one week prior to starting the final university examination, Plato's Republic was over, but not our fear of the fees for the private tuition and the cots of such sumptuous nourishing food.

As he finished teaching, one of us courageously asked about his fees. He had a peal of loud hearty laughter at our foolish question. "You are my students, like my children. How can you pay fees for my teaching? I couldn't complete the course in the department. So, I asked you to come home on Sunday when I could take some time out for you".

Next innocent, inquisitive question from another student, "But sir, you fed all of us such good quality mangoes, sweets, and milk every Sunday. It must have cost you a lot." The second burst, "you are young and came from long distances. You must be hungry. If you are hungry, you won't be able to concentrate on study. And, it's not easy to read Plato. I had to ensure that you are not hungry so that you concentrate. When you come to the department, you are our students. But when you come home, you are not only the student but also my guest. It's in our Indian cultural tradition that guests are like Gods; we must treat guests to the best of our capability."

He came to the entrance of his house to see us off. We touched his feet, seeking his blessings. He blessed us with two parting statements. "Never go to a class or before an audience without preparation. You'll waste their time and make a bad name for yourself. Second, never go late for any assignment. Many of you will grow up to speak to learned gatherings. If you are late by five minutes, you will waste five minutes of each in your learned gathering. It will be the case of violation of the human rights of your audience. All the best."

What he conveyed in this concluding day conversation is wisdom. Teaching Plato was knowledge.

online and offline learning resources and peer group discussion across time and space through technology-facilitated synchronous and asynchronous modes.

One major shift in the role would be changing the oral knowledge communication (classroom lecture) to knowledge communication through self-learning materials in text, video, games, quizzes and tests, apps and simulations and provision of own time access and digitally generated feedback. The UGC has initiated the process by including learning material for SWAYAM as an evaluation item for promotion. A new role of higher education teachers would be quality-assured content creation.

An associated role of higher education teachers is content curation to assure quality, accuracy, relevance and morally and socially non-invasive learning (non-discrimination on religion, creed and colour, and gender, tolerance and respect for differences and non-violence). This is necessary as much of learning will accrue from online content, and the WWW contains a wide variety of content, not excluding subversive and socially undesirable content.

As the scope and opportunity of conventional lectures will steadily reduce with the adoption of blended learning, the indirect instructional role of teachers will increase. An indirect instructional role

in face-to-face mode will imply learning facilitation through interaction and constructive feedback. The facilitation process may mean complementing self-regulated learning in groups, occasionally engaging in conversation, and interaction, providing constructive feedback, supplementation with minimally invasive instructions, or sharing a scholarly view of the teacher that may not be available on the Internet. Another facilitation is to localise the learning content to local situations and connect it to life experiences bringing in elements of experiential learning; designing activities to engage students for deep learning through activity-based learning. The skills of thinking can be catalysed using metacognitive processes.

Teachers can play a significant role in facilitating metacognition. They can help students with self-questions, reflect on what and how they learned, and provide process feedback. Drawing from the psychology of growth mindset (Dweck 2011), teachers may change their tenor and language of feedback – from quantitative indicators of achievement like marks and grades to the learning process - how a student learned. Teachers will help students improve conceptual complexity (David Hunt) and learnability of students or learning to learn. The evident and viable assumption is that learning outcomes will improve with smarter learning processes strengthened by metacognitive processes.

Finally, when qualified persons in physics or history, engineering or architecture join the teaching profession, they become physics educators, technology educators, history educators or language educators. Only a few become physicists, historians, architects, etc., not excluding their role as an educator. For role effectiveness, higher education teachers and academic leaders must be familiar, preferably well conversant, with educational science - philosophy and purpose of higher education, curricular framework, instructional system design, educational technology, learning assessment, student motivation, Research in Higher Education, and quality management in education.

Conclusion

Teachers' role so far has been overburdened with pedagogical practices adopting the banking model of education (Friere, 1970)[5]. Higher education students are adults. The appropriate science of learning for adult students is andragogy. Adult learners are knowledgeable, experienced decision-makers with well-developed learning styles and brain-wiring, self-perception, self-respect, and confidence. Higher education teachers need a paradigm shift in their perception, belief and attitude towards their students. The Chanakya Niti says, 'प्राप्ते तु षोडशे वर्षे पुत्रं मित्रवदाचरेत्' (as children reach the age of 16, treat them as friends (read as 'equals'). Accordingly, teachers must respect their learners' knowledge and experience, self-esteem and self-concept, capability to learn independently, decision-making ability and preferences, and act as co-learners engaging in honest intellectual conversations.

In conclusion, teachers can play three roles. They can communicate information and influence and inspire students. Technology is far more potent in organising and sharing information with greater effectiveness. Technology cannot influence and inspire students. Teachers' roles are to influence immediate change and transformation, inspire sustainable transformation, and instil students on the treadmill of sustainable lifelong self-learning.

Endnote

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Last Thing First: Rubrics as Innovative Tools for Learning

B L Gupta*

The quality of education imparted in any educational programme can be assessed by the assessment system being followed in the institution. The students examine the assessment criteria and decide the magnitude of learning efforts to be put into the learning process. In education management, it is often talked about as the first step in the planning process i.e. setting the objectives to be achieved. Similarly, the assessment standards, assessment policy, scheme, assessment tools, assessment techniques, assessment approaches, assessment modes, and format for reporting the results of the assessment should be put in the curriculum of each course. Of course, the complete assessment scheme will be guided by programme educational objectives, programme outcomes and specific outcomes, programme structure, and course outcomes.

The National Education Policy 2020 mentioned four pillars of educational programme viz imaginative curriculum, engaging pedagogy, formative assessment, and support services. The curriculum document is the educational plan for any educational programme. Therefore, the curriculum needs to be designed and developed scientifically incorporating the total assessment scheme which will guide the students about the standards of assessment and learning efforts to be put in to achieve the learning outcomes. The curriculum document will guide the teachers to prepare the course plan and implement it for developing the desired level of learning outcomes.

UGC (2019) issued evaluation reforms in higher education institutions. The evaluation should be linked to learning outcomes and institutional goals. The assessment should promote student-centric learning. The assessment rubric is used to provide objectivity and communicates the expectations on assessment and relate the learning outcomes. It ensures consistency, transparency, and fairness. AICTE (2018) stated that rubrics provide a powerful tool for the assessment and grading of students' work. They can also serve as a transparent and inspiring guide to learning.

In outcome-based education, emphasis is given to the demonstration of competence and proficiency in the world of a work situation or simulated situation. The achievement of learning outcomes is measured using criteria and indicators. A wide range of rubrics is prepared and used to develop competency and proficiency at a predefined level. Since the rubric is used for facilitating the learning up to a predefined level of competence so if it is used for assessment there will not be assessment anxiety, tension, and stress.

Rubric is innovative tool because it is used at almost all significant stages of learning such as advance organizer, motivation for learning, self-learning, peer learning, group learning, diagnosing the learning problems, offering constructive feedback for further learning, anchor for learning, scaffolding for learning, reflection on learning, recognition on the progress of learning, assessment, and certification. The concept, types, purposes, and preconditions to use the rubrics are described in subsequent sections.

Concept of Rubric

The rubric is a scientifically designed valid, reliable, accurate, and feasible learning tool that is used by teachers and students for setting learning standards, motivation for learning, self-learning, receiving feedback, learning problem solving, taking corrective and preventive actions on the progress of learning, recognition of learning, certification and decision-making tool to continuously improve the quality of the education.

It is prepared in the matrix or graphical form to list out the main criteria of assessment in a first column and strong and direct descriptors for each criterion in each row. The descriptors for each criterion indicate the magnitude or intensity or level of ability or level of proficiency desired in each criterion. The descriptors for a criterion may be three,

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four, or five. Rubrics act as a planning, monitoring and review, and evaluation tool for managing the learning process. It is a communication tool for internal and external communication on the academic and research function of the institute. It is a tool that acts as an advance organizer for learning, reduces anxiety, tension, and stress related to learning and assessment, and makes the complete process joyful. It is integrated with the significant steps of the learning process of the students and aligned with the learning outcomes. An example of a rubric for summative evaluation of surveying (prepared by the author) is given in Table-1.

Types of Rubrics

There are many types of rubrics developed over the years with different purposes in different contexts. Some of the commonly used rubrics are briefly described below:

Holistic Rubric

A holistic rubric is used for certifying the terminating ability and proficiency related to the world of work. It gives a broader and full assessment related to competency. Generally, all aspects of performance such as safety, leadership, quality, environment, economics, and communication are assessed along with core ability. It can have 5 to 10 assessment criteria and 3 to 5 descriptors for each criterion. It is used for certification and selection purposes. In organizations, a holistic rubric is used for assessing the demonstration of course level

Table-1: **Rubric for Surveying**
Course Outcome: ***The student shall be able to survey for building project***

Sl No	Criteria	Weight-age	Excellent	Very good	Good	Average	Poor
1.	Planning for the survey project	20	All essential equipment and resources are identified 20	One piece of equipment or resource is missing 15	Two pieces of equipment or resource is missing 10	Three pieces of equipment or resource is missing 5	More than three pieces of equipment or resource is missing 0
2.	Organization of resources and equipment	10	All essential equipment and resources are organized scientifically 10	One piece of equipment or resource is missing 8	Two pieces of equipment or resource is missing 6	Three pieces of equipment or resource is missing 4	More than three pieces of equipment or resource is missing 0
3.	Use of equipment	30	Effective and efficient use of equipment and resources with a purpose 30	Use of equipment with 90% precision 25	Use of equipment with 80% precision 15	Use of equipment with 70% precision 5	Use of equipment with less than 60% precision 0
4.	Safety	20	All safety precautions followed 20	90% Major safety precautions followed 15	80% Major safety precautions followed 10	70% Major safety precautions followed 5	Less than 60% Major safety precautions followed 0
5.	Record keeping	20	All essential and necessary data/ information collected 20	90% essential and necessary data/ information collected 15	80% essential and necessary data/ information collected 10	70% essential and necessary data/ information collected 5	Less than 60% of essential and necessary data/ information collected 0
	Total	100					

competency on all aspects of learning viz cognitive, affective, and psychomotor. Many criteria at a time viz in a design consideration for scientific design, safety, sustainability, economics, and social connections. Holistic rubrics are used for summative assessment, certifying competency and proficiency, and selecting the best student for competency attainment.

Analytical Rubrics

Analytical rubrics are used for assessing the different learning outcomes necessary to develop course-level competency. The detailed rubric is prepared for encouraging self and peer learning and attaining a minimum level of competency. The main purpose of the analytical rubric is to motivate students to learn up to a predefined level of proficiency. It is used by the course teacher for diagnosing learning problems of students as a class, reflecting on the progress of learning and depth of learning, reinforcing the achievement of learning outcomes, scaffolding on previous learning for further learning and providing constructive feedback for improving the learning with respect to course outcomes. It is difficult for students to exactly know the causes of a good score and the reasons for a poor score. In other words, the specific feedback for improvement is not directly available. Only the course teacher may provide specific feedback for improving the learning. Carmen (2019) stated that each criterion of the analytical rubric is evaluated separately and explicit combination rules are used to derive a mark.

Generic Rubrics

Generic rubrics are put in the curriculum document to be followed across the discipline and across the programmes for developing and assessing generic competencies such as leadership, interpersonal relationship, safety, communication, presentation, quality assurance, professional ethics, constitutional values, universal human values, science, technology, engineering, and mathematics. These rubrics communicate the philosophy of educational programmes offered by the institute and the quality of education.

Specific Rubric

Specific rubrics are used for assessing a critical competency of a discipline without which the degree should not be awarded viz safety in the electric and chemical industry, quality assurance in the pharmacy industry, and maintenance in mechanical engineering.

Observational Rubric

The observational rubric is used for assessing the cognitive, affective and psychomotor skills during the performance. These are used in those performance situations where the skills cannot be assessed after the performance is over viz communication, safety, presentation, body language, hygiene, proactiveness, interpersonal relationship, conflict management, leadership, demonstration of professional ethics, observational skills, etc.

Feedback Rubric

As the name indicates the feedback rubric is used for monitoring the progress of learning and improving the learning and learning process. It is commonly used for producing learning and not for assessment. It is combined with the assignment, project, case study, role play, seminar and similar methods of learning used for learning, self-evaluation, and peer assessment to get feedback on progress in learning. The feedback rubric contains two additional elements in the analytical rubric viz. observable characteristics and suggestions for improvement. It is used for assessing the process skills or transferable skills (professional, communication, critical thinking, problem-solving, interpersonal skills) and developing them in the right way. Students can use feedback rubrics for self-assessment and self-improvement which is essential for developing learning to learn skills and increasing the maturity of students in the learning process (Doug Czajka, 2021). These rubrics are self-contained so can be used by self, peers, and teaching assistants which reduces the time and effort of the course teacher. These rubrics are used in distance and online education programmes.

Grading Rubric

The grading rubric is prepared for assessing content-based learning to award grades in formative and summative assessments. The main purpose of the rubric is to award grades or marks on the progress of learning and the secondary purpose is to provide recognition for learning and feedback on learning gaps. In outcome-based education, it is used for reporting the progress on the development of ability and proficiency.

Scoring Rubric

The scoring rubric is prepared for assessing content-based learning to award marks in formative and summative assessments. It is used where the score is to be used for comparing the performance of the students in different courses or comparing the performance of the students with students of different educational programmes.

Purposes of Rubrics

Rubrics are versatile educational tools for outcome-based education (Gupta, 2021). These should be used for producing learning and assessing learning. These are becoming popular in almost all disciplines of higher education. Rubrics make the learning and assessment process involving, faster, and joyful. The purposes of rubrics are briefly stated below:

Assessment Standard

Rubrics used for the assessment of terminal outcomes such as programme outcomes and programme-specific outcomes indicate the assessment standards of the outcome. The quality of the programme can be ascertained based on the rubrics maintained for the programme for a period of three years.

Motivational Tool

The rubrics prepared and published by the course teachers to assess the learning of students act as a motivational tool for the students. Students know what to learn, how much to learn and how the assessment will be carried out. The rubric motivates students to get involved in the learning process and learn up to a predefined level of learning.

Self-learning Tool

The scientifically designed rubric especially analytical and feedback rubrics facilitates self-learning in the right direction. These rubrics help students to take corrective and preventive actions to progress in the right direction in the right way to achieve the learning outcomes. These rubrics enhance the learning maturity of students in terms of the management of self-learning.

Learning Problem Diagnosis Tool

The analytical and feedback rubrics are used for diagnosing learning problems. The students know the assessment criteria and parameters. They can self-assess the progress in learning and diagnose the learning problem in terms of gaps in learning and wrong learning. The other types of rubrics are useful to course teachers to diagnose learning problems and take corrective and preventive actions.

Feedback-Providing Tool

A rubric is an objective tool to provide specific, measurable, realistic, and timely feedback to learners in self-assessment, peer assessment, and teacher assessment approaches. One can give and receive positive, constructive, encouraging, development-oriented feedback based on the use of rubrics in the learning and assessment process.

Corrective and Preventive Measure Tool

The course teacher assesses the learning of individual students or groups of students using a rubric and identifies the learning gap in general and wrong learning in particular. The course teacher may conduct tutorials, and remedial sessions and assign self-learning lessons to students to remove the learning gap and correct the wrong learning.

Recognition Tool

The rubric is used as a self-recognition of achievement of learning outcomes. It provides intrinsic satisfaction in the progress of learning and a sense of accomplishment in the achievement of learning outcomes. Similarly in peer assessment and assessment by the course teacher appreciation may be recorded.

Rubric as a Certification Tool

In outcome-based education certification of attainment of programme outcomes and course outcomes is essential. A rubric is strong and direct evidence of the attainment of learning outcomes.

Decision-making Tool

At the programme and course level rubric is used as a decision-making tool for taking policy decisions at the institute level to improve the quality of the educational programmes in various ways such as training, providing additional resources, revising curriculum, organizing interaction with the outer world and sending students for internship and completing live projects. HEIs conduct various competitions such as project competitions, seminar competitions, and paper competitions at national

and international levels. Rubrics is an accurate assessment tool to decide the winners on objectively defined and declared criteria. The assessor biase can be minimised and complete process of assessment can be made transparent. Gupta (2021) concluded that rubrics are being used in the technical education system for developing and assessing the abilities stated in fig. 1.

Rubrics are used for assessing the core abilities and process by-product learning abilities (transferable abilities and abilities for which no learning effort is put). These are used in self-learning for developing and improving proficiency in learning-to-learn abilities. These are used in peer learning and team learning to develop cooperative, collaborative, critical thinking and investigating skills. These are used in formal learning for maintaining the assessment portfolio of students and in informal learning to enhance the learning skills such as minute observation, observing code of conduct, leading a team, communicating without fear and the like.

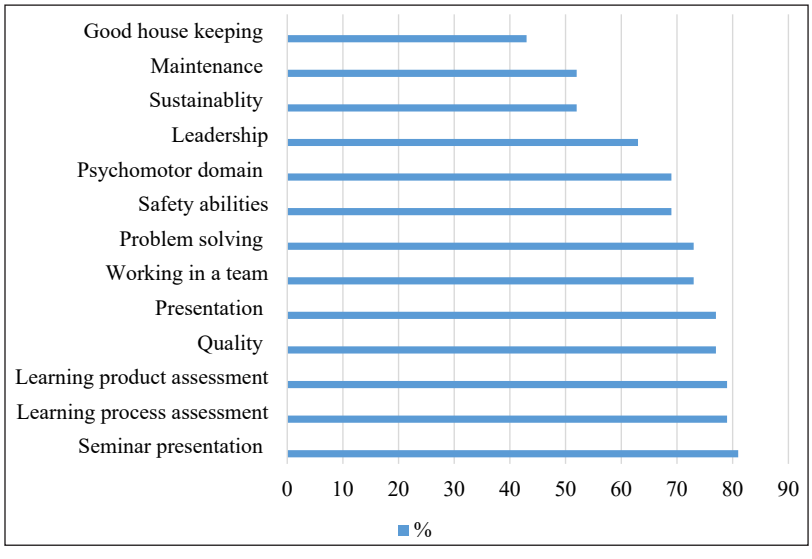
The ability and creativity, of course, teachers play an important role in integrating the rubrics with the learning and assessment process and use it for exploiting the full potential of the rubrics. Pedro (2017) developed a web-based adaptable rubric which can be used for an intelligent tutoring system. The rubrics are used for acquiring knowledge and developing complex skills. A series of rubrics can be used to see the development pattern of the students on simple to complex forms of abilities in project management, problem-solving, multidisciplinary research and the like. Rubrics such as holistic are useful to develop and assess the complex core and related abilities in an integrated manner and in totality. The rubric used for self-assessment, peer assessment, and assessment by the course teachers validate the progress of learning and the gap in learning.

Ahmet (2020) stated that the rubric helped students to design the product on predefined criteria in the rubric, improve the product design, and draw the performance pattern of the students. Kenneth (2007) stated that the rubrics contribute to student learning and programme improvement. The benefits of the rubric are learning targets are clear, a guide to instructional design and delivery, an accurate and fair assessment process, a tool for self-assessment and peer feedback, and advanced learning of students.

David (2018) reported that students perceived rubrics as effective components for guiding their individual learning process. Jason et al (2021) evolved a model for collaborative rubric construction with students. This model comprises four phases viz literature review and use of Delphi method, rubric co-construction, use of rubrics and model of collaborative rubric construction. Anders (2007) stated that rubrics make expectations and criteria explicit which facilitates feedback and self-assessment. Dawson (2020) described 14 design elements based on the literature review. These elements are specificity, secrecy, exemplars, scoring strategy, evaluative criteria, quality levels, quality definitions, judgement complexity, users of the rubric, creators, quality process, accompanying feedback information, presentation and explanation.

Nick (2010) discussed the innovative assessment from the assessment tools, methods, engaging students in the learning process, and involvement of stakeholders' perspectives. The importance of self-assessment, peer assessment, and group assessment is described.Mahmood & Jacobo (2019) described the importance of

Figure-1: Use of Rubrics for Assessing Abilities



a sliding scale rubric for reviewing the progress of the assessment. Zenobia (2019) described the good practices in standardization of evaluation criteria, the objectiveness of evaluation, guidelines for students' work and transparency in evaluation. Bad practices are a vague description of the marking scheme and failure to provide the range of marks for each grade.

Preconditions to Effectively Use The Rubrics

A rubric is a scientific measurement and assessment tool so it requires certain conditions to be satisfied to exploit its full potential for learning, assessment, and development of the students in the context of NEP ---2020. These conditions are the existence of a scientifically designed curriculum, well-articulated learning outcomes, preparation of course plan integrating the assessment, students' assignments and projects at par with learning outcomes, well-defined assessment criteria, awareness and training of teachers and students to effectively use the rubrics, and culture of using the rubric institution-wide (Gupta, 2022).

Kenneth (2007) stated that the rubrics should be professionally used for developing and assessing the most important and complex abilities. The rubric should not be too narrow or too broad. Rather it should be aligned with the instructional process and learning outcomes. Julie (2018) concluded that the rubric needs scaffolding i.e. to involve students in the initial discussion on using rubrics, engaging students in the discussion about the rubric and encouraging student-centred learning. The rubrics should be scientifically designed and used for producing the learning involving the students in the learning process. Brookhart (2018) concluded that at graduate level descriptive rubrics are used with three, four and five levels the involvement of students in using the rubric for learning and feedback was limited. Simon (2013) recommended to include positive points in the rubric, specific critical thinking skills, and expectations from students.

Suggestions

At National Level

1. Training mechanisms should be developed for resource persons who will manage the assessment and examination portfolio in HEIs. A training programme on the SWAYAM platform should be launched for all teachers on an assessment system aligned with the requirements of NEP 2020. Only certified resource persons should become in charge of assessment and examination centers in HEIs.
2. A clearing house for assessment tools may be created to standardize and provide sample assessment tools that can be used for learning and assessment.
3. National-level research studies should be conducted to develop more insight into practices of assessment.

At *Institute Level*

1. The assessment guideline document and assessment scheme for educational programmes should be displayed on the institute's website.
2. Standard rubrics for critical learning outcomes may be put in the curriculum document.
3. Teachers and students should be encouraged to use the assessment tools and techniques for learning and assessment.
4. Awareness of assessment should be created among teachers and students from a learning perspective.
5. The experiences related to assessment should be documented and published for wider use.

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Transforming Higher Education through Financial Restructuring: Minimum Funding vs Maximum Autonomy

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Hon'ble Prime Minister Shri. Narendra Modi, while campaigning for the Lok Sabha elections in 2014 coined the slogan of "*Minimum Government, Maximum Governance*" which has become the motto of his government. Union Home Minister Shri Amit Shah while speaking as a Chief Guest in an event organized by 'The Indian Express' reiterated that due to 'Minimum Government, Maximum Governance', the schemes launched by the government have been successful and benefitted the masses at the grassroots level. He further stated that the minimum government and maximum governance refer to reducing the government intervention in the day-to-day activities of common people and empowering them to ensure their growth as well as the growth of the economy. The government thus adopted the policy of *Sabka Saath, Sabka Vikas, Sabka Vishwas aur Sabka Prayaas* which led to increased people's participation in all their schemes.

The slogan 'Minimum Government, Maximum Governance' also means fewer public undertakings and pushing up for privatization. Through this disinvestment process, the government generated more than Rs. 4 lakh crores since it came into power in 2014. So far, it has generated Rs. 31000 crores in 2023. This is because the current establishment feels that the government has no business to be in business and it should just play the role of facilitator. 'Minimum Government, Maximum Governance' is no more a slogan but a basic guiding principle by which the policies of the Central Government are governed.

'Minimum Government, Maximum Governance' has relevance in the higher education sector as well. When we look at the structure of the Higher Education sector, as per 2021 AISHE data the country has 1,113 registered universities (including the Institution of National Importance). In total 1099 universities responded to the survey held during the year 2021, out of which more than 40 per cent were from the private sector.

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Apart from universities, there are 11,296 standalone institutions and 43,796 colleges registered under AISHE which are affiliated with the state universities of their region. Out of the total colleges registered with AISHE, 41600 responded during the survey period 2020-21 and out of these colleges 21.4 per cent are government colleges and 13.3 per cent are private (aided) colleges and the remaining 65.3 per cent colleges are private (unaided colleges). Out of 10307 standalone institutions which responded during the survey, only 23.8 per cent are run by the government, rest 76.2 per cent are run by the private sector. If the 10.1 per cent of private (aided) institutions are left out still 66.1 per cent of standalone institutions in India are run by the private sector and do not get any grant from the government. So, considering all the higher educational institutions (HEIs), approximately 65 per cent of the HEIs are run by the private sector which does not get any grant from the government.

The state and central universities contribute 59.1 per cent of total universities and account for 73.1 per cent of the total enrolments. Private universities constitute 40 per cent of the total universities but have only 26.3 per cent of the total enrolments. Balance 0.8 per cent of total universities (government-aided deemed universities) have 0.6 per cent of the total enrolments. However, these private institutions enrol more than 60 per cent of the students pursuing professional courses at undergraduate and postgraduate levels. However, when government and private (aided) & private (unaided) colleges are considered, they constitute 21.4 per cent, 13.6 per cent & 65.0 per cent respectively. The enrolments done are 34.5 per cent by government colleges, 21.1 per cent by private (aided), and the remaining 44.4 per cent of enrolment is done by private (unaided) colleges. So, given the fact it can be said that the majority of students going to government or aided institutions go for traditional courses instead of professional courses. This may be because these professional courses are mostly run in a self-financed mode in government institutions and the

fees charged by these institutions are comparatively higher compared to traditional courses run by these institutions.

Funding of the Higher Education Institutions

The union budget produced by the finance minister for the financial year 2023-24 has allocated Rs. 44094 crores for higher education which is an increase of around 10 per cent over the previous year's allocation. The allocation to UGC has been increased by 9.37 per cent. The grants to central universities deemed universities, and institutes of national importance have also been increased by a considerable amount as compared to the last financial year. The overall allocation for education in this budget was Rs. 1,12,899 Cr., an increase of around 8.26 per cent over the previous year. Out of this total allocation done for education, only 40 per cent of it has been allocated for higher education. The proportion of it remained almost the same over the years. Also, the share of this allocation in GDP has remained stagnant at around 2.9 per cent. However, a greater commitment by the government is still awaiting to reach the target of allocating 6 per cent of the GDP for education by the year 2030 as suggested by New Education Policy 2020.

Major portions of this allocation for higher education are going towards the salaries and pensions of the employees of the universities and colleges which results in a very small proportion going towards maintaining the quality infrastructure at the institutions located especially in rural and remote areas. This affects the quality of education at these institutions and students are less interested in attending the classes. This culture of students not attending classes came into the media limelight in the year 2022 when one Assistant Professor of Hindi in Bihar staged a drama to return his 33 months' salary to the college administration as no students have turned up for the classes during the period. Later, he apologized for his actions, but still, the fact cannot be denied that the enrolments in such colleges are an eyewash as most of them do not attend the classes. Even, the college management is not concerned whether the students are attending the classes or not, as they are getting their salaries on time. This is seriously affecting the quality of students passing out from such institutions and further affects their employability. One such study conducted by Wheebox National Employability Test (WNET) in 2022 concluded that more than 50 per cent of the youths passing out from institutions in India are unemployable, which sets an alarming bell as an educationist. Today we are facing a situation where the posts advertised by institutions/organizations are not being filled on the one hand and on the other hand many of the candidates having a Ph.D. degree are applying for the posts advertised for lower-grade jobs. This seems contradictory and puts a question mark on the quality of education being provided by our institutions.

This situation may have arisen due to the reason that our students are not taking their education seriously as they feel that they are paying a meagre amount as fees for their education. So, on the one hand, this meagre fee paid by students in public universities and colleges leads to poor attendance of students and faculty leading to poor quality of education in many institutions and on the other hand this system of subsidized education also increases the dependency of the state and central institutions for higher education on government grants, as the contribution of student fees to the source of funds for central and state universities and their affiliated colleges is very less. The creamy-layered students who enrol in such public institutions/universities for the option of low fee structure thus fail to realize that such actions lead to an overall intellectual fall of the nation. Public institutions are receiving more than 80 per cent of their fund requirements from the government. This is almost four times what the state universities/institutions are getting in the United States of America. The state-funded institutions in the US, Australia, and a few Asian countries are getting a very high percentage of their fund requirements through student fees. They are also tapping other sources in the form of research grants from various organizations, funds from alumni, and industrialists for philanthropy.

Less dependence on government grants brings more autonomy to the institution and this can be achieved when institutions are getting a free hand to charge more from the students and tap other sources as well to raise their funds. Premier institutions like IITs are also able to get just 6-7 per cent of their fund requirements through student fees. This may be because only one-third of the students pay the maximum fees charged by the institution and the remaining pay subsidized fees. The students' fees if increased and students from weaker sections may be provided support by the government, will bring more

resources and hence autonomy to these institutions. The Indian Institute of Management (IIM) is comparatively enjoying more autonomy as it is less dependent on grants from the government. IIMs are able to charge higher tuition fees, and this contributes almost 85 per cent of its total fund requirements.

The Gross Enrolment Ratio (GER) in higher education is around 27 per cent and the New Education Policy 2020 has taken a target of 50 per cent GER by 2035. Today, India is lacking behind the global average of 38 per cent of GER in higher education. Our neighbour China has achieved a GER of more than 50 per cent. To achieve this rate by 2035, India needs almost double the number of institutions it is having today. For that huge investments in establishing new universities and colleges are required by the government. This does not seem possible until the dependence of the existing universities and colleges is reduced on grants by the government to almost half of what is being done today. This can be achieved only if these institutions are given autonomy in deciding on the fee structure to be charged from students and start looking for other sources of funds apart from student fees and the institutions are able to collect revenue from these sources at least to the extent of salaries and pensions being given to its employees. The funding can just be limited to improvement in infrastructure in these existing institutions and the establishment of new universities and colleges. This will thus support the government to achieve the target of 50 per cent GER in higher education by 2035.

Another logic behind passing on the burden of higher education to the students is that it has more private benefits than public benefits. So, higher education is considered to be a pseudo-public good and hence the burden should be borne by both, the government, and the students.

The role of the private sector also cannot be ignored in achieving the target of 50 per cent GER by 2035, as more than 65 per cent of the universities, colleges, and standalone institutions are being owned and operated by private players. These universities, colleges, and standalone institutions operated by the private sector enrol around 35 per cent of the students and these institutions are funded by student fees alone. The contribution by different funding agencies and project grants is minimal. India needs more such institutions to achieve the target and this is possible only when granting permission to start new universities and colleges made less cumbersome without compromising on quality. Also, private institutions should be encouraged by the government to focus more on sourcing the funds through projects and research grants which will let their faculty members and students have more practical exposure, and the quality of students passing out from these institutions will improve over a period of time. This way these institutions will also be able to utilize their world-class infrastructure developed over the years and dependability on student fees will reduce, which in effect will bring the cost of education down and enrolment in these institutions will grow, which will lead to achieving the target before 2035.

Funding of Education by Students

As autonomy is granted to the central and state universities, colleges, and standalone institutions, these institutions will be required to generate more revenue from tuition fees and other sources and decrease the dependency on government funding. These institutions will get a free hand in deciding on their tuition fees and it will increase tremendously from the current level. This will lead to education getting out of reach for many students. The role of government becomes important here as providing access to quality education to economically weaker students is the responsibility of the government and that is possible through a blended model of loans and scholarships.

The government in this reverse funding model will be required to run a comprehensive scholarship scheme for such students who are not able to afford the increased fees of higher educational institutions and the funds will be created by curtailing the grant to public universities/institutions. The amount of scholarship can be directly granted to the students, once the student applies for it through various portals launched by the government for the purpose and the eligibility has been verified. The eligibility for a grant of scholarship can be based on the merit or income level of the family of students so that such schemes are more widespread. Once granted, the student can use this money for the purpose it is intended for at any educational institution of his/her choice, irrespective of whether it is a private or government institution. This will lead to a healthy increase in competition between the institutions and thus create a level playing field between public and private higher educational institutions, one which is able to satisfy the students

about the quality of education provided by them and also about the future progression of the student after finishing the course from that institution will win over the students. The students in rural and remote areas too will start asking the institutions in their region to improve the quality of education provided by them, as they will pay from their pocket or through scholarships and take education seriously and students will be able to know the real cost of education. This model will not only lead to quality education but will also improve the employability of the students which will lead to greater success and will be able to contribute positively to the growth of the Indian economy.

These scholarships are provided to the students in the form of financial grants by the state so that these students can continue with their higher education. Apart from scholarships, needy students can be provided with financial assistance which can be in the form of loans etc. Scholarships provided to the students for specific programs may be based on merit and students may not be required to return them.

Financial assistance provided in the form of loans by the government or some authorized financial institutions is based on as chosen by the students. If the student chooses some financial institution, then they may be provided with the loans after checking the creditworthiness of the applicant. The terms and conditions of the loan can be agreed upon with the mutual consent of the bank and the customer. However, if students opt for financial assistance in the form of a loan from the government, then the refund of money is to be done after successful completion of the course by using any one of the below :

i) On successful completion of the course, the student may opt to work for the government on a contractual basis for a few years, in various schemes as launched by the government. Once the student completes the contractual period, the student shall be free to take a job of their choice either in the government sector or private sector or may even think of starting their own venture. Such students will be high in demand as they meet the educational qualification as well as have requisite experience too. If found suitable, the government may even absorb them in some permanent position lying vacant in their agencies.

ii) The student may even opt to pay taxes on their income at a higher rate than the rate which is applicable to their income for a few initial years. This will not be even burdensome for the students as they have very few liabilities during the initial years. These liabilities increase as they grow old, get married and start their own families.

iii) If a student opts to go out of the country upon completion of the course, then the loan as given by the government may be transferred to some financial institution after settling the due to the government. The financial institution may check the creditworthiness of the applicant and may even ask for some collateral.

Financial assistance as provided by the government in the form of grants and loans may cover other expenses as well apart from the tuition fees, which will induce students to continue with their further studies after finishing school education. This will reduce the number of dropouts after the completion of school education as they need not worry about the cost of education and their living expenses during the period of their higher education. Also, upon the successful completion of their education, the hope of getting employment will be very high and they may lead a comfortable life.

This will have a tremendous effect on the Gross Enrolment Ratio in higher education. Also, this will provide a level playing field for all institutions, including the private players. More and more private players will enter the education industry and it will bring revolution in this sector, as it has brought to the healthcare sector after the launch of the Pradhan Mantri Ayushman Bharat Yojana and National Dialysis Mission launched by the Government of India in the year 2018. With the launch of these schemes, access to quality health services has reached the poorest in society, and claims under these two schemes have been increasing with time. According to the data published in the economic survey volume 1 for the year 2020-21, the total number of claims for these two schemes combined together has reached a level of more than 3,00,000 claims every month in January 2021, just after 3 years of its launch. With time more and more people will get the benefits of this scheme and will get access to quality health services.

The main reason for the success of *Pradhan Mantri Ayushman Bharat Yojana* and the National Dialysis Mission may be attributed to the reason that the benefits are directly given to the end users instead of passing through government hospitals as done in the past. These schemes too would have

met the same fate as earlier schemes launched by the government. The direct benefit transfer to the public gave a level playing field to all involved in providing health services and new private hospitals with quality health facilities have come up in all parts of the country, even in remote locations. This has also forced government hospitals to improve their quality and hygiene. A similar scheme of Direct Benefit Transfer in domestic cooking gas has brought benefits to the end consumers as well as the vendors. The waiting period for gas cylinders is a thing of the past and the consumers are getting it delivered to their doorstep at their preferred time. Also, the subsidies are being directly transferred to the bank accounts of the consumers. This has brought transparency in this sector. Once any such scheme of direct benefit transfer in the education sector is launched, then it will bring the same benefits to the sector as well. The autonomy of the institutions will increase along with the quality of education provided by these institutions and will also bring all institutions including the private ones in parity and the poorest in the society will get the benefit of quality education in a chosen institution of higher education and the government will achieve the targets as mentioned in NEP--- 2020.

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Education Budget: Empowering *'Amrit Peedhi'* in *'Amrit Kaal'*

Nikhil Kant*, R K Soni and Kumari Anjali*****

With a record high allocation for education in the budget 2023-24, the efforts of the Indian government are focused on preparing the youths of *Amrit Peedhi* for the future with an aim to achieve India's aspirations in the *Amrit Kaal*. The budget's seven priorities complement each other acting as the 'Saptarishi' and aiming to guide India through the *Amrit Kaal*, the era of opportunity and prosperity. Overall, the focus of the Budget 2023-24 on education and preparing for the future reflects a positive outlook towards the empowerment of *Amrit Peedhi* in *Amrit Kaal.*

The Union Finance Minister of India, Ms. Nirmala Sitharaman, had presented last year budget 2022 with a focus on digital education, the creation of a digital university, job creation, agricultural universities, skill development of programmers, and other reforms aimed at boosting the Indian economy and facilitating 'Ease of Living'. The last budget had proposed a series of reforms with far-reaching effects that continued the government's efforts to promote the education sector. The 2023-24 Budget presented by Union Finance Minister Nirmala Sitharaman aims to build upon the successes of previous budgets and continue the government's efforts to boost the Indian economy and facilitate 'Ease of Living.'. In this budget 2023-24, seven priorities have been adopted to complement each other and act as the *'Saptarishi'* to guide through the *Amrit Kaal.* These priorities are Inclusive Development, Reaching the Last Mile, Infrastructure and Investment, Unleashing the Potential, Green Growth, Youth Power, and Financial Sector. The Budget 2023-24 aims to energize the Indian economy and empower the *Amrit Peedhi* being the first budget of the *Amrit Kaal. Amrit Kaal* is a term used by the Indian government to describe a period of prosperity and growth in the country, particularly in relation to economic and social development. The term comes from Vedic astrology and is often used to describe a 'golden era'. Hon'ble Prime Minister Shri Narendra Modi first used the term in 2021 during the 75th Independence Day speech referring to the next 25 years as *Amrit Kaal*. The expression "*Amrit Peedhi*" alludes to India's youth populace and their development. The Indian budget of 2023-24, otherwise called the Amrit Kaal budget, has put an exceptional spotlight on supporting India's workforce, including the *Amrit Peedhi*. The Union Budget 2023-24 is built on the outline drawing for *Amrit Kaal*, with a focus on improving the quality of life of the people through inclusive growth and development. The 2023 budget builds on the efforts and adopts seven priorities that complement each other and guide through the Amrit Kaal, a time of transformation and renewal, to bounce back from the fallout of Covid-19 and war, and also to exhibit remarkable resilience to head towards a bright future.

Technology-driven and knowledge-based economies are included in the vision for Amrit Kaal. On February 01, 2023, the Union Finance Minister presented the Union Budget of India 2023-24 in the Lok Sabha which was the fourth budget of the NDA government's second term, starting from 2020 highlighting the government's focus on promoting technology-enabled development. In her Budget speech, she emphasized the government's vision for a prosperous and inclusive India, in which development benefits all citizens, particularly the youth of the *Amrit Peedhi*. This year, India celebrates its 75th year of Independence, and the world recognizes the country as a 'bright star' with an estimated economic growth of 7%, the highest among major economies. With the G20 Presidency, India has a unique opportunity to strengthen its role on the global platform with the theme of '*Vasudhaiva Kutumbakam'*. The Finance Minister also highlighted the importance of the education sector and the need to develop and nurture talent to achieve the country's economic goals. She emphasized the need for quality education and announced initiatives to promote research and innovation in the education sector.

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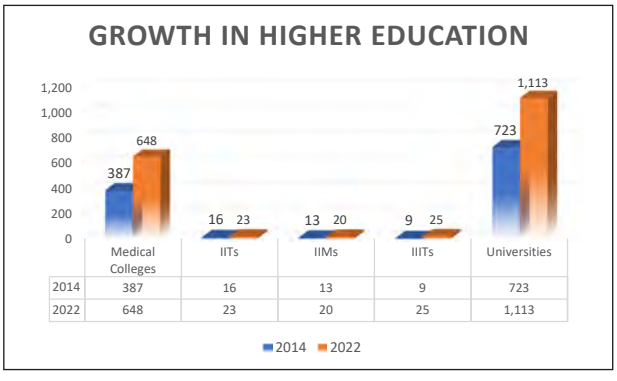
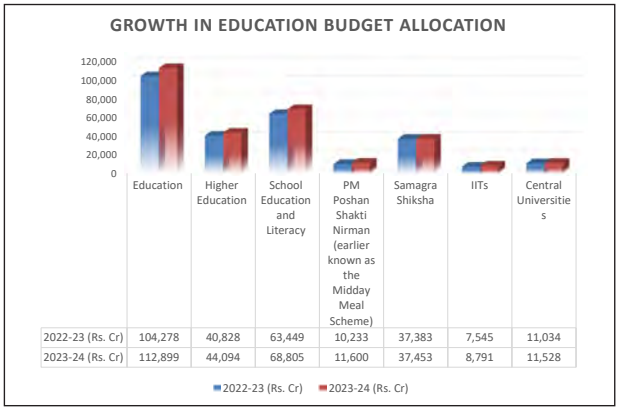
Economic Survey 2022-23, released just before the budget highlights the higher student enrolment, better school-level infrastructure, and more teachers to teach. It highlights an increase in the total enrolment in higher education to nearly 4.1 crore in the financial year 2020-21 from 3.9 crore in 2019-20, and also an increase of around 72 lakh or 21% in enrolment since 2014-15 with similar growth at the rate of 20% of distance education. Moving forward, the Budget 2023-24 sets an ambitious, people-centric agenda to address challenges and make significant progress in various Sustainable Development Goals. It envisions a technology-driven and knowledge-based economy, which is evident from the increase in total enrolment in higher education, including distance education, and the growth in the number of secondary and senior secondary schools, medical colleges, Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs), Indian Institutes of Information Technology (IIITs), and universities between 2014 and 2022. While the number of secondary and senior secondary schools have risen in the country, medical colleges have also increased from 387 to 648, IITs from 16 to 23, IIMs from 13 to 20, IIITs from 9 to 25, and Universities from 723 to 1113 between 2014 and 2022 (Figure 1).

Figure 1. Growth in Higher Education (2014-2022)



The budget allocation for education stands at Rs 1.12 lakh crore, which is 7.7% more than the previous year's allocation of Rs 1.04 lakh crore. Out of this allocation, the share of school Education is Rs 68,804 crore 8 per cent more in comparison to Rs 63,449 crore (BE) allocated last year and Higher Education is Rs 44,094 crore, 7.9 per cent more in comparison to Rs 40,828 crore (BE) allocated last year. This allocation includes Rs 37,453 crore for the *Samagra Shiksha Abhiyan*, the flagship program of the Indian government for providing funds to school education from pre-primary to higher secondary level as against an allocation of Rs 37,383 crore last year. In this budget, IITs have been allocated ₹ 8791 crore for research and academics this year as against ₹ 7545 crore. The budget highlights the higher allocation of funds to school education with an aim to push the PM Poshan scheme immensely subsuming the mid-day meal plan whereas higher allocation in higher education is with an objective to enhance funding to some of the CFTIs except the IIMs, which are being encouraged to achieve self-sufficiency (Figure 2).

Figure 2. Growth in Education Budget Allocation in 2023-24



There is no doubt that the allocation and focus of the budget on the education sector will play an important role in achieving the goals outlined in the NEP- 2020. The youth will be prepared for the future as the government emphasizes skill development and ties education to industry and professional spheres in order to prepare them for the future. Moreover, the budget recognizes the importance of AI and includes initiatives to enhance these skills through the revamped PMKVY, which offers Indian youth a wide range of career opportunities globally. This focus on education, skill development, entrepreneurship, R&D, digital infrastructure, green growth, and job creation is a step towards transforming India into a technology-driven knowledge-based economy. Over the past nine years, the government has been dedicated to improving the quality of life and ensuring dignity for all citizens. The National Education Policy (NEP) is a progressive framework that aims to enhance the growth and development prospects of the nation in the following decades. The NEP's focus on empowering youth and promoting skilling, job creation, and business opportunities is already

yielding dividends. It is inspiring to see how India has more than doubled its per capita income and moved up to the 5th largest economy in the world from 10th in the last nine years. India is now recognized as a well-governed and innovative country that provides a conducive business environment. The government's commitment to education and the NEP have been instrumental in bringing about this transformation. The NEP has been formulated to empower youth and help the *Amrit Peedhi* realize their dreams by focusing on skilling, adopting economic policies that facilitate job creation at scale, and supporting business opportunities. The budget allocation for the education sector in the Union Budget 2023-24 has been praised by the Hon'ble Prime Minister Shri Narendra Modi, who called it a 'historic budget for education'. He stated that the allocation would help the country's youth to develop skills and make them employable. The Union Education Minister, Shri Dharmendra Pradhan, has also praised the budget as having the 'highest ever allocation' to the education sector and has expressed hope that it will pave the way for India to transform into a knowledge-based economy. While Economic Survey 2022-23 has highlighted higher student enrolment, better school-level infrastructure, and more teachers to teach, through this budget, the Indian government has allocated a significant budget to the education sector in the Union Budget of 2023, which is a positive sign for the development of the sector. The allocation has been praised by the Prime Minister, Finance Minister, and Education Minister of India, who have emphasized the importance of quality education and innovation in the sector. The Education Minister has welcomed the budget allocation for the education sector and highlighted the importance of using technology to promote digital education. He has categorically mentioned that the allocation would help bridge the digital divide and provide equal opportunities to students from all backgrounds.

The budget proposals demonstrate the government's continued dedication to education and innovation. The establishment of 157 new nursing colleges in co-location with the existing 157 medical colleges, coupled with the availability of ICMR Labs' facilities for research, will encourage collaborative research and innovation. The promotion of research and development in specific priority areas and the support of dedicated multidisciplinary courses for medical devices will ensure that skilled manpower is available for futuristic medical technologies, high-end manufacturing, and research.

It is heartening to note that the Union government's budget has given due importance to teacher training, capacity-building schemes, and promoting a culture of reading. This reflects the government's commitment to inclusive and sustainable development. The budget's emphasis on introducing innovative pedagogies, advanced training, and research measures for teachers is also commendable. By addressing education from a more holistic perspective, the government is laying a robust foundation for future growth. The government's emphasis on re-envisioning teacher training through innovative pedagogy, curriculum transaction, continuous professional development, dipstick surveys, and ICT implementation is commendable. The District Institutes of Education and Training will function as vibrant institutes of excellence for this purpose.

The proposal to establish a National Digital Library for children and adolescents and the encouragement of states to provide infrastructure for accessing the National Digital Library resources will make quality books available across geographies, languages, genres, and levels, with device-agnostic accessibility. Physical libraries at panchayat and ward levels will complement this initiative. The budget also aims to build a culture of reading to make up for pandemic-time learning loss. The government plans to encourage the National Book Trust, Children's Book Trust, and other sources to provide and replenish noncurricular titles in regional languages and English to physical libraries, collaborating with NGOs working in literacy to be part of this initiative. The financial sector regulators and organizations will also be encouraged to provide age-appropriate reading material to these libraries to inculcate financial literacy. The recent budget has provided a roadmap for the next three years to strengthen the 740 Eklavya Model Residential Schools, which currently serve over 3.5 lakh tribal students. It is part of this initiative that the central government will be recruiting 38,800 teachers and support staff in order to ensure that quality education is provided to tribal communities throughout India.

It is also noteworthy to mention that the proposal has been made to launch Pradhan Mantri Kaushal Vikas Yojana 4.0, which is expected to provide skill training to lakhs of youth in the next three years. In this initiative, the emphasis is on the use of on-the-job training, industry partnerships, and aligning the courses with the needs of the industry. This ranges from coding, AI, robotics, mechatronics, IOT, 3D printing, drones, and soft skills to new-age courses for Industry 4.0. By setting up 30 Skill India international centers planned to be set up across India in different states to provide skills training to youth for international opportunities, the budget's efforts towards transforming the education ecosystem are evident. Additionally, the budget has taken steps toward transforming the education ecosystem by establishing 100 labs at engineering institutes with the aim of improving the digital infrastructure for the medical sciences as well as developing 5G services capabilities. The establishment of three centres of excellence for Artificial Intelligence (AI) in top educational institutions is a significant step towards realizing the vision of 'Make AI in India and Make AI work for India'. These centres will collaborate with major industry players to conduct interdisciplinary research, develop cutting-edge applications, and provide solutions in the areas of agriculture, health, and sustainable cities. The plan to set up 100 labs in engineering institutions to develop applications using 5G services is also promising, providing immense potential for realizing new opportunities, business models, and employment potential for the *Ámrit Peedhi.*

The budget also recognizes the employment potential in environment-friendly Lab Grown Diamonds (LGD) and proposes to provide a research and development grant to one of the IITs for five years. This initiative aims to encourage indigenous production of LGD seeds and machines, reducing import dependency and boosting the theme of 'Make in India.' The introduction of a National Data Governance Policy is also a significant step toward enabling access to anonymized data, unleashing innovation and research by start-ups and academia. These initiatives together will contribute to the growth and development of India's youth and promote a sustainable and prosperous future for the country. This budget also proposes a unified Skill India Digital platform to enable demand-based formal skilling, linking with employers including MSMEs, and facilitating access to entrepreneurship schemes. This expansion of the digital ecosystem for skilling is a commendable step towards the development of the Indian workforce. At a time when India is expected to become the country with the largest working-age population by 2030, the Indian workforce needs to be equipped with the necessary skill-sets to match the demands of different industries and employers. The budget proposes to provide stipend support to 47 lakh youth in three years rolling out Direct Benefit Transfer under a National Apprenticeship Promotion Scheme. This will help the Indian youth to develop their skills and make them employable. To achieve the goals of the '*Dekho Apna Desh'* initiative, the budget proposes to connect it with sector-specific skilling and entrepreneurship development. This will further empower the Indian youth to become job-ready and support the development of the tourism industry. In the budget, the plan to empower SEBI to develop, regulate, maintain, and enforce norms and standards for education in the National Institute of Securities Markets and to recognize the award of degrees, diplomas, and certificates for the purpose of building the capacity of functionaries and professionals in the securities market has been showcased. This will ensure that the Indian workforce is skilled and knowledgeable to cater to the requirements of the securities market. In fact, the proposed educational and skilling initiatives in this budget are not only commendable but are essential to equip the Indian workforce with the necessary skill-sets. These initiatives will help in the development of the tourism and securities market industries and make the Indian youth of the *Amrit Peedhi* job-ready.

In conclusion, this budget appears to be progressive enough to provide a strong impetus for growth and employability and is a testament to the Indian government's vision and aim to accelerate efforts towards inclusive and sustainable development. This Budget is a remarkable foundation for India's future, with a comprehensive boost to education, skill development, job creation, and entrepreneurship. The government has placed great emphasis on building digital and public infrastructure with a keen focus on sustainability, which will serve as a boon for the education and entrepreneurship sectors. The proposed initiatives and the encouragement to learn and adopt new-age educational courses are steps in the right direction toward bridging the gap in skill

and employability. The proposal of the National Digital Library for children and adolescents will pave the way for greater community participation, with the support and guidance of top-rated HEIs. The teaching community also has reasons to cheer. The initiatives are phenomenal that will contribute immensely to the growth and advancement of vocational education within the education sector, and therefore this Budget, as a whole, is a positive step towards a brighter future for India, with its comprehensive approach to education, skill development, job creation, entrepreneurship, and the growth and advancement of vocational education within the education sector, and is a step in the right direction, signaling the government's commitments towards creating a brighter future for India, making India a more competitive and innovative player in the global economy. Overall, the government's efforts to promote the education sector and boost the Indian economy have been consistent and far-reaching. The government hopes to achieve its goals through public participation and collaboration. This budget also includes provisions to support start-ups and the youth, with a focus on the NEP- 2020 and skilling programs. While in entirety, budget 2023-24 demonstrates a strong commitment of the Indian government towards inclusive and sustainable development, focus on the education sector is especially noteworthy, as it has the potential to greatly benefit the country's youth in *Amrit Peedhi* by emphasizing skills training and connecting education with industry and professional spheres aiming to provide Indian youth with new-age skills and career opportunities. The budget aims to further India's aspirations in the Amrit Kaal, as the country moves towards its 100th year post-independence, with a focus on growth, technology-enabled development, energy transition, climate action, and all-inclusive welfare. Budget 2023-24 offers immense potentialities to provide a strong impetus for growth and employability as a blueprint that lays a solid foundation for India@2047, when independent India turns 100, and it is a testament to the government's efforts to empower *Amrit Peedhi* in the *Amrit Kaal.*

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The Evolving Role of a Teacher: A Sage to Facilitator

Shalini Johar* and Vinod Kr. Shanwal**

With each passing day, I feel I know less as Google knows more than me.

-A Teacher

Teachers are essential to the nation for improving sustainable education. They strive to expand their students' foundations. But with the advancement in technology their role has changed from knowledge owner to knowledge facilitator. As knowledge is everywhere, the teacher has to create a learning environment where learners are encouraged to think critically and creatively as well as take ownership of their created knowledge and direct their learning. This article argues the changing roles of teachers in the 21st century and throws light on the need for upskilling teachers to meet the National Education Policy---2020 NEP vision.

Nowadays, anything one wishes to know is just a click away. It hardly takes a second to google anything. One can simply download content, and can easily view lectures on YouTube, there is an array of OERs available online. If one can teach oneself then - Where is the need for teachers? Can technology replace teachers?

Education is the process of acquiring knowledge, abilities, values, morals, and beliefs in order to realize one's full potential. It is regarded as the single most effective tool for fostering social and individual development, which moves society closer to social justice and equity. Education is an element of human evolution. In education, teachers play a crucial role. They advance human potential by transforming lives, igniting dreams, and inspiring students. It is the teachers' role to guide, educate, and raise students to be contributing members of society. Formal education is a tri-polar process of aims, curriculum, and evaluation and has four verticals: Teachers, students, curricula, and infrastructure (Das, 2021). Teachers being the most important vertical plays an essential role in achieving the goals of education.

For many decades teacher has been looked at as the epitome of knowledge, an institution in itself, whose role has been to impart knowledge. But the advancement in technology has changed the way one learns. Today learners are 21st-century learners, they are more mature, and can only survive in the global world if they have skills like Cognitive, Interpersonal, Technological, Information Media, and above all life skills (Sardar,2018). Today's education places a strong emphasis on developing life and career skills, it needs to meet the need of an industry. In nutshell, teaching is only effective when students can use the learning outside of the classroom.

No doubt technology can be used to gain knowledge but teachers' support is necessary for learners' social and emotional development. Teachers mould learners' minds to exhibit curiosity, develop sensitivity toward the environment and prepare them for the 21st century. This makes teachers' roles more complex, challenging, and indispensable. The relationship between teachers and students is always evolving or everchanging with time but the core will always remain the same, the former will always act as a navigator. Despite the fact that the position of a teacher has been around for as long as humanity, it has undergone significant change. In contrast to the past, when teachers were viewed as the primary source of knowledge and their role was restricted to that, today their primary role is to set objectives and design the learning process in order to facilitate learning (Hari,2018). They act as a guide on the learning path by challenging students' thinking, enhancing their abilities, and providing a suitable environment for learning. Traditionally their aim was to ensure students achieve good marks or perform well in exams but today they dawn many hats, they are mentors, counselors, motivators, paper setters, curriculum designers, and influencers as the aim of education has shifted to the development of multidimensional skills in students. Now the teacher is not only a preacher or giver he is a co-learner and co-constructor of knowledge as learning is a lifelong process. So, it can be said that the role of a teacher has evolved from that of a sage on the stage to that of a facilitator of learning processes**.** Some of the changing roles of teachers are discussed here.

Role of Teachers in the 21st Century

With the widespread adoption of technology, the educational system of the 21st century has undergone a significant transformation. The demands of the classroom in the twenty-first century are very different from those of the previous one. But this fact can't be denied that the vital health of a country depends on the work of its teachers. Regardless of whether a student attends a school, college, or university, a qualified teacher is their foundation (Lister, 2016). The impact teachers have on the life of students can never be changed. It is important

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for teachers to support and encourage their students as they come to terms with their passions, identify their goals, and work towards realizing those goals. In the 21st century, teachers don't have one definite role, they have many roles to play like planners, supporters, facilitators, enablers, etc.

Planner

In this world of cutthroat competition, students are always at the crossroads of which career option to choose. Teachers act as a planner to support them to choose as per their capabilities and their psychology. No doubt three R's: Reading, wRiting, and aRithmetic are essential skills for students but they need to be combined with the Five C's: Creativity, Conceptualization, Collaboration, Communication, and Computation recommended by Sir Kenneth Robinson (Gordon et al., 2012). These skills are introduced to the students by their teachers. The teachers enhance the critical thinking skills of students so that students can prepare themselves for multidisciplinary jobs. The teacher is one who can give the right direction to the students for developing a career in the twenty-first century.

Facilitator

"You cannot teach a man anything; you can only help him discover it within himself."

– Galileo

The role of teachers in this century is of facilitators, they facilitate students' learning and establish productive learning environments where students can acquire the skills they may need in the near or distant future. Earlier teachers used to lead the discussion and be the loudest in the room but now they enable a discussion on the topic to happen while they remain neutral themselves. Being a facilitator means, the teacher does not control the activities of the learners and gives room for learners to express their innovative and creative selves. The learning process will be comprehensive when students will be engaged in active participation in discussions and teamwork activities (Amin,2016; Suneetha, 2020). All this is important as students will be able to engage in depth in their learning and will be able to direct it. Today's teachers must be active collaborators, open-minded and critical professionals, and facilitators who assist students in making decisions about the reliability and quality of new sources of information (Weinberger, Fischer, & Mandl, 2002).

However, being a facilitator is not an easy role to play, teachers have to undergo a lot of homework to get specific performance levels from students, and they have to work according to the demands of the curriculum and prepare students for examinations i.e., not according to the individual needs of the students. Teachers need to have a thorough understanding of educational psychology, learning theories, and innovative methods of teaching and learning.

Teachers who encourage students' personal development are exceptional, special, and deserving of respect. Genuine understanding, respect, decision-making, problem-solving attitude, and the ability to communicate effectively with others are the main characteristics of facilitators.

Optimizer

Teachers are optimizers too as they focus their efforts on making continuous and gradual improvements in students. They constantly support students and create a conducive environment through planned activities to optimize students' productivity. Teachers, today need to develop multidimensional skills in students that is only possible when they are eager to explore, participate and learn in an optimal manner. Teachers must assist students in learning optimally by utilizing strategies that best suit their students' learning styles.

Communicator & Listener

Teachers are the role models of students. They imitate each and everything of their teachers whether it's elocution, mannerism, actions, etc. Communication skills are essential for teachers. Without effective communication skills, teachers will neither be able to convey information properly nor will be able to guide students' learning. Another essential skill for effective teachers is listening. Teachers won't be able to pay attention to their students and identify the specific areas that require improvement if they are not good listeners. With patience and endurance in listening teachers will be able to create healthy relationships with their students and would be able to mentor them in their time of need.

Digital Instructor, Learner & Resource Provider

"If we teach today's students as we taught yesterday's, we rob them of tomorrow".

- John Dewey

Teacher plays an important role to improve sustainable education. This century requires teachers to motivate and assist students in developing employability skills using digital tools. So, a teacher is a digital teacher too. In this age of digitalization, the internet is full of OERs, its teachers' responsibility to teach students what to search which resource is correct or wrong & which are evil resources. Students learn thoroughly if they have access to the resources when a teacher uses a collaborative approach to teaching. Students are able to direct their own learning when the teacher facilitates

them with supportive content materials available on YouTube or videos prepared by teachers themselves, eBooks, written documents, etc. With these collaborative efforts, students' critical, communicative, creative & commutative skills are easily get enhanced by making them future-ready.

Effective teachers are lifelong learners. They always keep themselves updated about the real world or the need of society so that they can share the same learning with their students. They remain informed of the recent developments in their field. For the benefit of the students, they learn the most recent technology. If the teacher needs to build the nation or wishes to prepare students for *Atmanirbhar Bharat* then he has to develop himself first. A 21st-century teacher is one who plays many roles and knows how to combine technology, pedagogy, and content (TPACK) to ensure collaborative, self-directed, and peer-to-peer learning.

Role of Teachers in Blended Learning

Blended learning (BL) is an educational technology that is an amalgamation of face-to-face and online learning (Graham, 2013) and is backed by a technological infrastructure that assists teachers in organizing course content, communication, and common workflows. It capitalizes on the advantages of both in-person and online learning, ideally combining the convenience of distance learning with the engagement of face-to-face encounters. In this, both students and teachers must be physically present in the same learning place. Increased student engagement, improved teacher-student interaction, experiential learning, self-directed lifelong learning, differentiated learning, flexible environment, outcome-based learning, etc. are merits of the BL environment.

BL uses technology to modernize and improve the effectiveness of face-to-face classroom instruction. Teachers provide different educational resources like video recordings, teacher-made podcasts, YouTube links, video lectures, OERs, etc. to the students. So that they can direct their learning themselves, and teachers get little free time to scaffold or create activities for students. In this teacher has the added role of facilitator as students are not passive receivers, they are active learners generating ideas, engaged in mind mapping, and brainstorming ideas. With the help of teachers' students get exposure to the real world they learn to co-construct the knowledge individually as well as with the help of peers. In nutshell, Bl is not only a learning environment but a collaboration of different teaching methods for maximum learning outcomes (Clark & Mayer, 2011). BL offers a variety of learning possibilities for students to learn in the way that suits them best. As a result, the concern that teachers may lose relevance in the teaching-learning process is unfounded. Teachers will continue to be the masters of the classroom, but with a heightened feeling of accountability.

Role of Teachers as per NEP—2020

With a focus on holistic development, innovation, and technology, the National Education Policy 2020 (NEP--2020) is the first education policy of the 21st century and replaces the 34-year-old National Policy on Education (NPE) 1986. This policy is erected on the Access, Equity, Quality, Affordability, and Accountability pillars. It aims to rework India into a vibrant knowledge society and global knowledge superpower by making both school and college education more holistic, flexible, multidisciplinary, suited to 21st-century needs, and aimed towards bringing out the unique capabilities of every student. This won't be possible without a teacher.

Keeping this in hindsight, NEP 2020 has placed the teacher at the center of the reforms in the education system of India. Teachers are the shapers of posterity, so policy has laid emphasis on reaffirming teachers as revered and important members of society. Teachers have been given autonomy for choosing appropriate pedagogy, designing course curricula, producing books, publishing OERs, and innovating in teaching and assessment methods to ensure outcome-based learning. For the holistic development of students, the policy lay emphasis on the development of creativity and higher order thing skills in students. It wants teachers to ensure critical thinking and problem-solving learning in students with social, ethical, and emotional learning. The ability to critically analyze a situation or issue and come up with original solutions is known as critical thinking. When students explore new concepts and think critically then only, they get engaged in their own learning. This needs a shift from teacher and imparter of knowledge to facilitator of knowledge. To play this role teachers themselves need to be skilled in critical thinking.

Need of Upskilling Teachers to Meet NEP---2020 Vision

The NEP views teachers as the centre of the educational process and finds them indispensable even in this new educational environment that places a strong emphasis on modernization and technology. Continuous professional development and professional teaching standards are essential for the development and sustainability of quality teachers. The NEP has stressed the need for the development of content pedagogical knowledge for both pre-service and in-service teachers. The policy recommends National professional standards for teachers (NPST). NPST aims to improve teachers' personal and professional development by giving an

understanding of performance expectations and what needs to be done to improve them.

NEP stresses safe infrastructure, teacher autonomy, reduction of administrative work for teachers to more time on teaching-learning, to maintain quality in recruitment eligibility tests need to be conducted, merit-based scholarships, need for implementation of merit-based structure for promotions and salary increments. The NEP encourages teachers to use technologies like Artificial Intelligence (AI) and Machine Learning (ML), which can aid teachers to tailor personalized learning styles consistent with a student's capacity, thereby improving learning outcomes and strengthening skill development. A teaching assistant is not new they take care of non-teaching aspects so that teachers can use their maximum time for the main activities of teaching, discussion with the students, etc. AI is an Intelligent teaching assistant that can automate non-teaching activities like preparation, comprehending students' levels, assignments, etc.

Through the vision of NEP-2020, more job creators than seekers will be produced. It will herald a replacement era of education in India that focuses on research, technology, and blended and experiential learning. It will strengthen the basics of education while taking into consideration global perspectives.

Conclusion

Today, the pedagogical challenge is less concerned with imparting factual knowledge and is more oriented toward transforming learners into lifelong, self-directed learners who keep learning throughout their lives. Every country on this earth wishes to reform its education system as they want to educate its children to take their place in the economies of the 21st century. The new century workplace values learners who think critically and creatively, have logical reasoning, can access and create knowledge, have communication and collaboration skills, remain updated, learn lifelong, and can process information from multiple perspectives. For this 21st century, skills need to be developed in the students and for that, it has to be integrated into the teaching-learning process.

When NEP is implemented in its intended manner across the entire country will establish such a community where our students can find a niche based on their skills and interests. Teachers will shift to multidisciplinary colleges where they would be teaching in the manner they find best for the students. Teachers will be honoured for innovative teaching strategies that enhance student learning in their classrooms.

Let's foster a supportive learning environment to students so that they can learn at their own pace and we teachers should make this journey of learning together enjoyable as learning is lifelong.

Guru Shiya Parampara will endure until the end of civilization, but their relationship and roles will continue to evolve as society progresses.

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Teachers' Perspectives towards Integrating Pedagogy with Moral Principles as a Revival of Values in the Indian Knowledge System: A Study

Suprita Kumari Sinha* and V K Shanwal**

The ancient Indian education system was known to be rich in human values and cultural artifacts and enormous knowledge and practices enriching and serving mankind. Over centuries, the royal patronage of our ancestors was passed on to scholars orally in the *Guru-Sishya system*. (Indian Knowledge System, 2022). Indian science was based on fundamental principles, logical inferences, and empirical observations and was written in sastra and sutras which can serve human existence in every situation. (Kak,2022). Macaulay's education system has kept the Indian knowledge system out of reach to the new learners and so we are following the same formal education system after independence. (Sahasrabudhe, 2022). A commendable effort has been initiated by Government in the revival of values with the Indian Knowledge System in order to assimilate the scientific, proven, culturally rich, and extensive but lost knowledge of Indian Culture. National Education Policy –2020 (NEP –2020) suggested holistic and multidisciplinary education in teacher education. Integrating various skills like pedagogical skills along with technological skills is already a part of teachers' training after covid 19 pandemic. It has been noticed that juvenile delinquency cases are increasing in India due to the degeneration of moral values in youth. For that, the initial requirement is to train elementary-level pre-service pupil teachers to practice value-based teaching methods in their teaching. This study is based on the attitude of pupil teachers practicing values for life to integrate them with their teaching practices. A self-prepared questionnaire was used to find their attitude and willingness in practicing value-based teaching methods. The self-prepared 5-point Likert scale was administered to 200 pupil teachers in Delhi-NCR. The result was found with descriptive analysis methods. Teachers are important pillars of society to sustain better future citizens. They are going to teach the children of the future. For the revival of values in Indian society, it is a dire need for pre-service pupil teachers to train with values.

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According to NEP---2020 one normal variable that can switch things around and lead the Indian school system out of its present environment of aimlessness and firmness to turn into a moderate, adaptable, multidisciplinary, innovative, and expertise-focused school system that will have the capacity to deliver capable, imaginative, talented, employable and moral students. This normal element is - the Teacher. NEP 2020 suggested that the new policy would adjust the country's school system to the necessities of the 21st century while remaining attached to India's worth framework. It showed concern about child-centered education with special attention to moral values, it can only achieve with the role model personality and positive efforts of the teacher. So, there is a need to improve the skills of the teacher to achieve the required goals of education.

Values are assets for life and should be imbibed into the students along with the curriculum through the teaching-learning process. These moral values build human personality and social standards which is directly proportional to society formulation and the growth of a Nation. The ancient Indian education system was known to be rich in human values and cultural artifacts and enormous knowledge and practices enriching and serving mankind. Indian science was based on fundamental principles, logical inferences, and empirical observations and was written in sastra and sutras which can serve human existence in every situation (Kak,2022).

A commendable effort has been initiated by Government in the revival of values with the Indian Knowledge System in order to assimilate the scientific, proven, culturally rich, and extensive but lost knowledge of Indian Culture. NEP--2020 suggested holistic and multidisciplinary education in teacher education. Integrating various skills like pedagogical skills along with technological skills is already a part of teachers' training after COVID 19 pandemic. It has been noticed that juvenile delinquency cases are increasing in India due to the degeneration of moral values in youth. Youth are assets of the nation and cultivating value education in them has become the need of the hour for the nation.

For that, the initial requirement is to train elementary-level pre-service pupil teachers to practice value-based teaching methods in their teaching.

Values for life or moral values are standards that help children judge and choose between right and wrong. Those values are gratitude, honesty, sharing, empathy, compassion, cooperation, respect, truthfulness, equality, humility, zeal, courage, and many more.

Pedagogical skills are teaching skills that must be developed in teachers during their training in order to instruct and manage students in the actual classroom.

Teaching skills are hard and soft skills that can help a teacher keep their students engaged during class. These skills can also help teachers to manage themselves as an educator, earning the attention and respect of their students. Few of the teaching skills are natural in behaviour, whereas others may require development with practice.

Pedagogical skills are like Writing Instructional Objectives, Stimulus Variation, Probing Questions, Reinforcement, Set Induction (Introduction), Explanation, Illustration, Black Board Writing, Questioning, Response Management skills, etc. So, when the teachers will be trained with essential moral values suggested by the IKS, these can be transferred to future students. So, there is a need to take a step ahead of policy planners, government, and institutions to train pre-service teachers with values.

We are reading about frequent cases of juvenile delinquency and adult crime in India. It has been observed that there is a constant decline in the morality of youth these days. In the present time, we are observing the degradation of moral values in children. We could easily identify the problem of the self-centric nature of children, nuclear family (isolation), dishonesty, addiction, irresponsible behavior, juvenile delinquency, etc. It is a dire need of imbibing values for life in children and then integrate and equip them with modern technology. There we feel concerned about integrating morality into the children and future generations through our rich culture and Indian knowledge system. Because our Indian knowledge system is rich with a huge repository of knowledge created by our forefathers which can provide various values to society.

Several studies and efforts had been done in this direction to induce morality in students through the teaching-learning process and that worked in a positive direction too. There is much scope in working for the betterment of this situation. For this, the teachers should be trained in a way to have the knowledge and advanced usage of technology along with the effective integration of pedagogical skills with enriched content knowledge. Despite everything, the central idea of Indian education is to restore our rich culture and Indian Knowledge system which we have inherited from our forefathers.

Literature Review on Moral Education

Kavussanu & Yaaribi (2019) in Oman has done a study on prosocial and antisocial behavior in sports students. This study aims to explain prosocial and antisocial behavior have both positive and negative consequences on one's psychological or physical welfare. This study, investigated those behaviors, discussed, and considered the concept of bracketed morality, and then discussed the consequences of prosocial and antisocial behavior for the recipient students. Kaur (2020), conducted a study on the effect of religiosity and moral identity internationalization as effective variables of prosocial behavior. A total of 400 female adults were taken for the study. A tool used as a questionnaire on religiosity, moral identity inventory, and prosocial behavior personality battery. The data were analyzed through ANOVA which resulted in more religious people being more responsible socially, empathetic, and perspective-taking abilities and this together interacted to produce a combined effect on moral reasoning.

Gui *et.al*. (2020) conducted a study on the roles of teachers and the challenges in developing students' morality. Both subjective and quantitative investigations were assessed. There were seven jobs of educators being tracked down in this review namely moral model, moral tutor, parental figure, virtue transport, facilitator, advocate, and communicator. Ribeiro *et.al*. (2020) from Brazil and different countries have jointly done research on the topic I found myself despicable being: Medical students face disturbing moral dilemmas. This study aims to investigate the nature of moral dilemmas, students' emotional responses, and the influence of these dilemmas on their professional development. A cross-sectional qualitative study was done through interviews.

Singh *et.al.* (2020), have jointly conducted a study in Malaysia on Pre-Service Teacher's Perceptions of Lecturer's Teaching and Learning Strategies in Moral Education at two different higher learning institutions.

A descriptive case study was done with focus group interviews of pre-service teachers. Ghorai, Khan, & Mohakud (2021), had done a study on the influence of family backgrounds related factors like types of family, caste, occupation, income, and educational qualifications of guardians on moral education in higher secondary students of west Bengal in India. A total of 444 students were taken under study where moral values were tested through a test developed by B.M. Benjamin. Alhassan (2022) conducted a study on teachers' moral evaluation of students in an inclusive secondary school which was a study of minority students' behavior and school performance. This study intends to examine the morality problem in a teaching and learning environment.

Literature Review on NEP---2020 Recommendations on Teacher Education

Aithal & Aithal (2020) has done an analysis of National Education Policy 2020 on achieving its objectives for teacher education programs. In this essay, different initiatives planned for the higher education system are highlighted, and they are contrasted with the current adopted procedure. NEP---2020's expected effects on various innovations and the Indian higher. The virtues of the educational system are explored. Finally, some recommendations are made for its successful use in accomplishing its goals. Parveen (2021) from Maharashtra has conducted a study on par360 Degree holistic assessment as a new approach to shape the personality of a learner as visualized by the national education policy 2020. A 360-degree approach otherwise called multi-source input, or multi-source evaluation is a cycle through which criticism from peers, educators, managers, and guardians as well as a self-assessment by the actual understudies is accumulated.

Mishra (2021), has published an article on National professional standards for teachers their retrospect and the roadmap for teacher education. The NEP 2020 anticipates that NPST will aid in raising the standard of instruction and instructors in India. A review of each of these points will enable us to offer a plan for creating and implementing the NPST in India. Chawla (2021) from Agrasen college, New Delhi has conducted a study on Mentoring of Teachers: The Much-Needed Changes in the NEP 2020. This paper brings to the front the absence of consideration given to tutoring programs for staff under the NEP--2020, especially in advanced education foundations, and contends for therapeutic measures to further develop homeroom rehearses.

Aggarwal (2022), has presented a paper on digitalized education and NEP---2020 in higher education. National Education Policy, 2020 has an extraordinary center around the web and computerized instruction. The paper examines the development of Online Education during the Coronavirus pandemic, attempts to distinguish the recent fads in Schooling, and breaks down the difficulties in the execution of Digital Schooling with a couple of suggestions regarding NEP-2020.

Summary of Literature Review

Since it is obvious that practicing values in life which are also part of our rich Indian Culture enhancement in human personality, and responsible citizen, society, and nation can be made possible. The NEP--- 2020 and IKS 2022 recommend the teacher's training with value education. Integrating value education in teacher education along with training teachers with teaching skills, technology, and content may help in reducing juvenile crime graphs in India.

The Study

The objective of the Study is to study the perspective of Pupil Teachers toward the integration of moral values with pedagogical skills. Qualitative and quantitative methods of study were used to study a Pre-service elementary school pupil-teachers pursuing B.Ed. courses in Delhi/ NCR. Self-prepared 5-point Likert Scale questionnaire was used as the tool.

Data Analysis

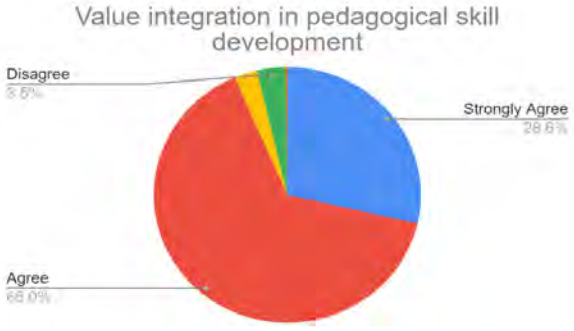
The data collected was analysed using a Tally table, frequency, and percent analysis. All the responses were converted into percentages to analyse the items on the scale.

Table 1: Table Showing the Number of Items of the Tool in each Subheading.

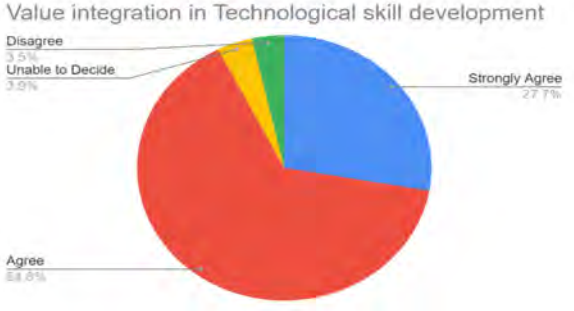
Focus of Measurement	Number of Items
Value integration in pedagogical skill development	13
Value integration in Technological skill development	10
Value integration in content selection	6
Value integration in overall teaching skill development	11

Pictorial Representations of the Result Under Each Subheading

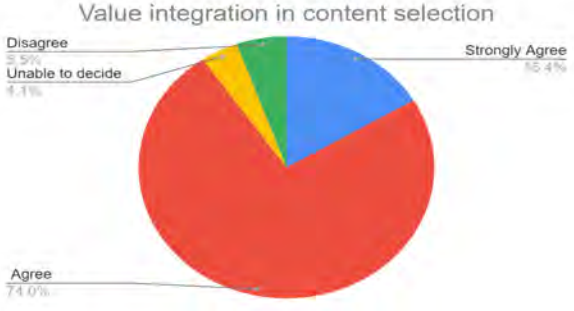
1. Analysis of data of questions on value integration in pedagogical skill development



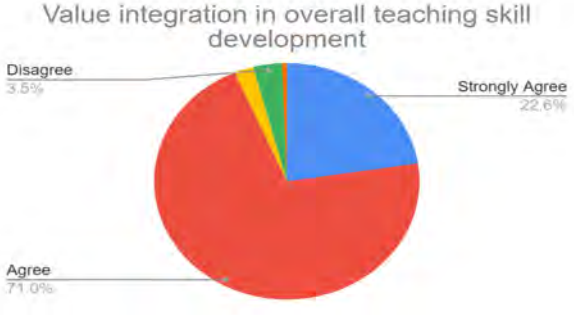
2. Analysis of data of questions on Value integration in Technological skill development



3. Analysis of data of questions on Value integration in content selection



4. Analysis of data of questions on Value integration in overall teaching skill development



Result and Conclusion

Values are empirical and assets of life, help in overall personality development, enhance professional skills as well as boost morals. The values for life help in enhancing leadership qualities and make us feel unique and confident in life.

From the data received it has been noticed that the need for value education is an essential phase in human development. To have humanity, confidence, truthfulness and compassion, equality, secularism, cooperation, and gratitude as values for teachers enhance their professional skills along with their teaching competency.

Since the data found also supports the need for integrating values in modern teachers' training and pedagogy, it should be part of the teacher's training curriculum along with the school curriculum. When teachers will be reared with moral constructs there will be a moral revival in future students.

According to this research and previous studies, it was established that a lack of education and awareness about the right code of conduct may be the cause of the decline in moral values among Indian youth. However, the trend in India is at the point where, if teachers draw inspiration from our rich culture, they can quickly engage students in moral education, good behavior, and respect for others' feelings and emotions. The teaching method can be changed, or if we can combine our diverse culture with cutting-edge methods, we might be able to instill values in our students. Traditional education can easily instill many of the values that the Indian knowledge system has instilled in us.

Some of the alternative and new trends that can be followed include experiential learning, integrating moral values with content and pedagogy, and practicing values in the school through co-curricular and extracurricular activities. Knowledge of the Vedas and Upanishads, as well as our rich traditional teaching method, can have a positive impact on students' morals and personalities at any grade level.

Because NEP--2020 and the Indian government have already begun a number of initiatives to emphasize the significance of instilling moral values in young people, we might see some opportunities. Therefore, if we move in the right direction of instilling values through regular instruction in pupil teachers, it will help in developing students' moral values.

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Future Agriculture Needs a Blending of Indigenous Knowledge and Modern Technology

S L Mehta, Former Deputy Director General, Education, Indian Council of Agricultural Research, New Delhi and Former Vice Chancellor, Maharana Pratap University of Agriculture and Technology, Udaipur delivered the Convocation Address at the 16th Convocation Ceremony of Maharana Pratap University of Agriculture and Technology, Udaipur on December 21, 2022. He said, "You have vast opportunities in front of you. As a responsible citizen, countries' expectations are very high from you. We need to bring cheer on the faces of the farmers who toil hard under sun or rain to feed the ever-increasing population." Excerpts

I deem it an honour to be with you on the 16th Convocation of the Maharana Pratap University of Agriculture and Technology, Udaipur. Convocation day is an auspicious day in the life of the university community, especially in the lives of the students who are receiving their degrees and awards after their academic pursuit and accomplishments. I wish to congratulate them all for their achievement and meeting the aspirations of their parents and alma mater. I wish them all the best for their successful career and professional attainments. I offer my congratulations to the faculty members who worked hard to impart quality education, knowledge and skills to students which enabled them to get their degree and excel in their field.

University Achievements

MPUAT has the distinction of being propeller of agricultural transformation in the state by release of new varieties, developing technologies for sustainability, promoting integrated farming system, technology dissemination leading to higher income to the farmers and entrepreneurship development. It has established leadership in developing qualified human resources who have played an important role both at national and state level. Alumni of the university have occupied important positions such as Director General ICAR and Secretary DARE; Chairman, ASRB; Vice Chancellors of several universities; MD, Amul and senior administrative positions.

Major achievements of MPUAT include Development of five Apps, launching of EF Polymer startup by CTAE student, establishment of Digital Technology Cell with Solar Powered Soil Testing Tower, humanoid robot, launching first agricultural Drone in the state, getting 12 patents in 2 years, MOUs with institutions of national and international repute, best performing university under the smart village initiative of the Hon'ble Governor. The first Chancellor's Award for being the Best University in the state and getting 15th rank at national level among 76 agricultural universities are all examples of outstanding academic, research and extension achievements for which the Vice Chancellor, faculty and the students deserve our heartiest congratulations.

Human Resource Development

Development of the skilled human resource is a key to the sustainability and profitability of agriculture. Use of knowledge, new technology and innovative ways hold promise for increasing production and profitability of Indian agriculture. In order to bring in livelihood and nutritional security in the new world economy, agriculture education must undergo a significant transformation to develop human resources who would have skills and entrepreneurship that enable them to meet the challenges of tomorrow. New education policy provides a bold new vision for quality assurance in agricultural education and a feasible plan for quality enhancement in shaping its future agriculture for making India a global economic super power. You are fortunate that MPUAT has received substantial support under World Bank supported National Agricultural Higher Education Project of ICAR which allows promoting innovation, linkages with best of the institutions, faculty and student training overseas and partnership with well recognised public and private institutions to improve educational quality and relevance. This has enabled you to acquire skills and entrepreneurship, confidence in making agriculture profitable and lifelong learning as mission. This is going to be the corner stone of your success in future endeavours.

Agriculture Scenario

Realizing the importance of agriculture in propelling Indian economy, the Govt. of India initiated

a series of reforms immediately after independence. Self-sufficiency in food grain production became an over-riding priority. The corner stone of the policy was establishing institutions of higher agricultural education for developing and disseminating new technology to the farmers for increasing agricultural production. India achieved remarkable growth in food grain production from a mere 51 million tonnes in 1950-51 to 316.4 million tonnes in 2021-22, which is unprecedented and admired world over. Total horticultural production has surpassed food grain production. In fruits and vegetables, the country achieved production respectively of 103 and 196.3 million tonnes in 2021-22 occupying second position in the world. In milk, country occupies first position with production of 209.9 million tonnes. In fish production country is second in the world with production of 14.2 million tonnes. The cradle of these successes has been the establishment of institutions which developed skilled human resources that led to generation of new technology, their refinement and dissemination, sound government policies and high receptivity of the farming community.

Issues and Concerns

Despite phenomenal growth, Indian agriculture presently is at cross-roads. The productivity growth is declining in irrigated agriculture, which is a matter of serious concern for sustaining and augmenting food grain production in coming years. The food security is still precarious and the efforts towards sustainable increase in production with lower input cost are still important and of dire necessity. Further, with the globalization of economy, Indian agriculture is facing far too many and newer challenges. Post-COVID, World is changing at an increasing pace and unleashing a complicated set of problems, challenges and opportunities. Since agriculture is a driver of economic growth, it is important to propel agriculture growth by use of new technology and innovative strategies.

One of the serious concerns is the limited availability of water. Per capita availability of water is going to decrease in 2025 to almost one fourth as compared to availability in 1951. The way out is for reduced demand through efficient use of water. It is imperative especially in the context of rainfed areas for enhancing water use efficiency through reduction in conveyance losses, water conservation through farm ponds and efforts for water recharge. You have developed a model of water budgeting in association with the Western Sydney University, Australia and KVK, Vidhya Bhawan by studies in Bhinder block. This needs to be adopted on large scale for sustainability. We shall have to produce more food grains with less available water and this would call for increasing the efficiency of water use in agriculture substantially.

Another big challenge is biotic stresses including insects, pathogens, nematodes and weeds that limit the realization of yield potential of crop plants. The problem is further aggravated in view of climate change, the changing agricultural practices, environment and more intensive cropping systems. Crop plants over the coming years will be threatened by completely new strains of pests and diseases. Preparedness for their detection, identification, and development of pest risk analysis based on pest database is of paramount importance.

Small and marginal land holdings, lower productivity in rainfed crops, degradation and depletion of natural resources, increased demand of agricultural land for urban and industrial development, inadequate mechanization, post-harvest losses, low financial investment and low income for farmers are our key concerns. These have to be addressed through science and technologies without compromising the sustainability of our natural resource base.

Climate Change and its consequential changes in water regimes, ground and air temperature patterns, effects on plant metabolism and seed development are projected to severely dent production in varying intensities. Therefore, efforts now are directed towards developing varieties that are climate resilient and on developing technologies that permit climate change mitigation. Mitigating the influence of climate change on agriculture will require sharing of insights of a diverse group of experts from different disciplines, policy makers and other stakeholders. The new breed of graduates will need to have knowledge and ability to communicate across disciplinary domains on these issues and work together to explore solutions.

Human Nutrition

Covid pandemic brought in sharp focus issues of human nutrition and specially the role of vitamins and minerals. Despite food grain self-sufficiency, malnutrition is still prevalent in large sections of the people with marginal income. Studies have also shown that intensive agriculture is leading to decrease in content

of minerals in many parts. Development of Biofortified varieties is the sustainable alleviation of malnutrition. Scientists have been engaged in developing nutrition rich varieties so that people consuming food grains and pulses derive major part of the nutrients from their diet. On October 16, 2020 the Hon'ble Prime Minister dedicated 17 Bio-fortified varieties of 8 crops to the nation. These are 1.5 to 3.0 times more nutritious than the traditional varieties. Now more than 100 varieties of nutri-rich cereals (rice, wheat), millets, vegetables, oilseed crops and tuber crops have been developed. These varieties have higher Zn or iron or beta carotene, better protein quality and other attributes of improved quality of food. This is remarkable development which will lead to nutritional improvement of economically deprived population. On India's request, year 2023 has been declared by UNO as the international year of Millets since millets are nutri rich, climate resilient and high yielding and can play very important role in improving human nutrition worldwide. They have higher content of minerals specially Ca, Fe, Zn and Mg besides having higher and better quality proteins. Rajasthan ranks first in pearl millet production. It is an opportunity for new graduates to establish start-ups in Rajasthan.

Integrated Farming Systems Approach

Integrated farming system holds the key to efficient management of natural resources, generating additional income and employment, promotion of sustainable agriculture and livelihood and nutritional security. MPUAT has demonstrated that Integration of crops, horticulture, dairy, poultry, goat rearing, fishery, duck rearing and efficient resource management technologies, leads to substantial increase in the income of the farmers. Under NAIP major economic transformation of 13,000 tribal families in 78 villages in 4 Tribal districts namely Banswara, Udaipur, Dungarpur and Sirohi was achieved with many becoming *Lakhpati* by adopting a combination of technologies of their choice. What is most heartening of this initiative was the contribution of Rs 3.5 crore by tribal farmers towards Sustainability Fund. In Mungthala village of Mount Abu farmers who were taught vegetable growing technology in 2006-07 by MPUAT are still continuing and are now earning Rs 10-15 lakhs per hectare per year because of their innovation in vegetable cultivation. For this I would like to congratulate the Vice Chancellor and the faculty involved in this transformation. If replicated, this can usher prosperity for every farmer in the state.

Biotechnology

Developments in molecular biology and recombinant technology are taking place at an unprecedented scale. The new technologies have given power to scientists to introduce any useful gene available in any bio-resource, silence any gene or have over expression of the gene for desired result. With genome sequencing done for many crops, the emphasis now is on annotation of genes, targeting the physical distance between genes for tagging genes or quantitative trait loci (QTLs) for agronomic adaptation, nutrient use efficiency, water use efficiency, nutritional improvement and biotic and abiotic stress tolerance. Already many transgenic crops have been developed integrating agronomical useful genes and conferring insect resistance and herbicide resistance or nutritionally superior traits. Success story of Bt cotton leading to doubling the production in India is a shining example of the benefits of transgenic crop. Time is not far when other transgenic crops would be allowed because they would have in built resistance against major pests and diseases, nutritional superiority and tolerance to water stress.

Another major advancement has been the development of genome editing technologies. Sequence-specific nuclease tools have made precision genome editing relatively quick and easy. The emergence of new genome editing methods, such as TALENs and CRISPR-Cas9, to complement zinc finger nucleases (ZFNs), has created a toolbox for creating precision gene alterations in crops. CRISPR-Cas9 is the most significant and revolutionary development in gene editing and has become the go-to research tool for making precise alterations to target genes. The targeting of Cas9 nuclease is easy and simple to achieve through modification of the guide RNA. A series of discoveries about the function of CRISPRs and associated proteins, including Cas9, showed that the molecular phenomenon could be harnessed to site-specifically cleave double-stranded DNA *in vitro and in-vivo.* Fortunately, Government of India has approved guidelines for the development and release of genome edited crops. In rice, scientists at ICAR-Indian Rice Research Institute, Hyderabad have developed genome edited popular Masoori variety and the new strain has 30-40% higher grain number and increased yield and the new variety will be released within one year. In Chickpea a new climate smart drought tolerant variety Pusa JG 16 has been developed by using genome-

assisted breeding techniques that allowed the precise transfer of drought tolerant genes from ICC 4958 in the parent variety J.G.16.

The new variety will be a boon for farmers of drought prone areas of the central zone of the country. Another breakthrough has been development of herbicide tolerant rice by scientists of IARI through MAS selection which will revolutionize direct seeded rice and lead to saving in water.

Agri-startups

Government of India is supporting start-ups in agriculture as a vehicle of agricultural transformation and bringing higher income to the farming community. Indian Institute of Millets Research, Hyderabad has supported more than 100 start-ups in minor millets. Vast scope exists for having start-ups in the fields of artificial intelligence, precision farming, sensor based support system, GIS technology, Value chain, Block chain, food processing and value addition, remote sensing, machine learning, use of Robotics and Drones, controlled environment agriculture, Nutrifoods, agribusiness management. Start-ups in these and many more areas will help build resilient and climate smart agricultural production system, promote global competitiveness, bring prosperity to small and marginal farmers and propel agricultural growth. Already Government has supported more than 800 start-ups in agriculture sector and more will be supported by incentives. Herein lies a great opportunity for entrepreneurs to be partner in this agricultural transformation. Capacity building of the farmers has led to attraction and retaining youth in agriculture.

Technology Dissemination

It is a matter of national pride that we have been able to develop models of effective transfer of technology to the farming community. Knowledge and knowledge management has been leveraged for the benefit of the farming community and has led to improving their livelihoods. Today most farmers have mobile phones and it is becoming popular to transmit them useful information through text and voice mail. WhatsApp is becoming popular and is a media of choice for information transfer and provide opportunity for bridging last mile connectivity. It is gratifying that almost all KVKs have been proactive in technology dissemination through the use of ICT during Covid pandemic. You have also demonstrated models for development of entrepreneurship. Now it has to be expanded to cover and retain more youth in agriculture. Hon'ble Prime Minister has given call and direction for doubling the income of the farmers. Today technologies are available to increase income many folds in a short time and the new graduates equipped with newer skills will have to shoulder the responsibility of augmenting the income of the farmers many folds. Government supported new scheme like ARYA, Jalshakti Abhiyan, agro-meteorological services, linkage with Common Service Centre and knowledge portal are going to play pivotal role in agricultural transformation.

Epilogue

Covid pandemic has affected human life in multiple ways including disruption of academics. However, human ingenuity and developments in science and technology have helped to a large extent mitigate the disastrous effects of the pandemic. It pushed digitisation and new world order whereby hybrid mode of education became a reality. Fortunately, despite disruption of many activities, agriculture production remained largely unaffected. Thanks to farming community, Government for sound policies and scientists for their very able assistance to farmers in this achievement. Future agriculture is going to be more and more knowledge intensive which has blending of indigenous knowledge and modern technology. Vertical farming, sensor based agro- inputs, digitisation, robotics and drone in agriculture, efficient natural resource management, precision agriculture and decision support system will be the order of day. New varieties in future besides being high yielding will be climate resilient and nutritionally superior. Innovation would be the hall mark of our efforts.

In the end, I would like to express gratitude to the Hon'ble Vice Chancellor Dr. Ajeet Kumar Karnatak for inviting me to address the convocation. Once again my heartiest congratulations to the students who have received their degrees and medals today. You have vast opportunities in front of you. As a responsible citizen, countries expectations are very high from you. We need to bring cheer on the faces of the farmers who toil hard under sun or rain to feed the ever increasing population. May God give you all blessings to realise your dreams of making India most prosperous and developed.

Jai Hind

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CAMPUS NEWS

Faculty Development Programme on Latest Perspectives of Research

The Faculty Development Programme on 'The Latest Perspectives of Research in Behavioural Sciences (Interdisciplinary)' was organized by the Department of Teacher Education, School of Education, Central University of South Bihar, Gaya under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) Scheme of Ministry of Education, Govt. of India through online mode, recently. The main objective of the programme was to acquaint the teachers of higher education institutions with the new techniques and strategies of research in behavioural science. The programme acted as a platform to acquaint the faculty members of Higher Educational Institutions across the country with the contexts, processes, outcomes, issues/problems, challenges and future prospects of research on behavioural sciences, especially from interdisciplinary perspectives.

The inaugural session of the programme was chaired by Prof. Kameshwar Nath Singh, Vice Chancellor, Central University of South Bihar, Gaya, and Prof. Harikesh Singh, former Vice Chancellor, Jai Prakash University, Chapra, Bihar was the Chief Guest of the programme. Prof. Kameshwar Nath Singh made the audience and participants mesmerized with his words of wisdom in his presidential address in the inaugural session. He stated that research is a rigorous practice which needs passion, perseverance, honesty and dedication. It makes the teachers capable and competent enough to bring quality education. Prof. Harikesh Singh, in his speech in the inaugural session, emphasized that every research must add an iota of knowledge to the existing knowledge. He said that the Indian knowledge system must be given priority in research through the medium of Indian languages. A total of 113 participants from various universities and colleges across 20 Indian states took part in the programme. A total of 25 resource persons (one from Indiana University, USA and twenty-four from different reputed universities/institutions of the country) contributed to the programme by enlightening and enriching the participants on the latest perspectives on research in behavioural sciences across forty sessions in the programme. The various stalwarts of the Education fraternity were present as the resource persons of the programme who explained the different complex concepts of research in Behavioural Sciences.

The main focus areas of discussion in the programme were Introduction to Research and its Types, Pre-positivism, Positivism and Post-positivism in Research, Qualitative Research Perspectives in relation to Quantitative Research Perspectives, Qualitative Approaches to Study Human Behaviour, Quantitative and Qualitative Research Tools, Behavioural Science Research and Research in General Sciences-A Comparison, Experimental Research and its Designs, Semantic Differential Analysis, Q-Methodology, The Context and Techniques of Using Statistics in Behavioural Research, Uses of Statistical Software for Data Analysis in Behavioural Research, Historical Research-A Qualitative Research Method in Behavioural Sciences, Policy Analysis-Purposes and Processes, Grounded Theory Research, Ethnomethodology, Symbolic Interactionism, Narratives, Phenomenological Research, Discourse Analysis, Interpretative Study, Naturalistic Inquiry, Participatory Research, Case Study, Content Analysis, Triangulation, Significance and Process of Using Mixed Methods Research in Behavioural Sciences, Behavioural Research for Innovation and Development, Frontline Areas of Behavioural Research, Interdisciplinary Research in Behavioural Sciences-The Way Forward, Research Issues in Diversified Behavioural Sciences- Social Sciences, Psychological Sciences, Educational Sciences and other Such Fields, Issues of Quality of Research in Behavioural Sciences-The Global Perspective and others.

The Valedictory Session was chaired by Prof. Prakash Chandra Agarwal, Principal, Regional Institute of Education, NCERT, Bhubaneshwar. He inspired the participants to be honest and transparent while conducting research in behavioural sciences. He suggested that research requires patience and is a time-consuming affair, therefore, mutual cooperation or collaboration is important in the process of conducting research. The active involvement and

cooperation of Prof. Kameshwar Nath Singh, Vice Chancellor, Central University of South Bihar, Gaya led the programme towards its success in the self-sustaining mode. Prof. Kaushal Kishore, Head, Department of Teacher Education, and Dean, School of Education, Central University of South Bihar, Gaya provided help and cooperation for making the programme successful. The programme was coordinated by Dr. Tapan Kumar Basantia, Nodal Officer of the PMMMNMTT Scheme and Associate Professor, Department of Teacher Education, Central University of South Bihar, Gaya, and Dr. Mitanjali Sahoo, Assistant Professor, Department of Teacher Education, Central University of South Bihar, Gaya and Dr. Sandeep Kumar, Assistant Professor, Department of Teacher Education, Central University of South Bihar, Gaya were the Co-coordinators of the programme.

International Conference on Excellence in Research and Education

A three-day International Conference on 'Excellence in Research and Education' is being organized by the Indian Institute of Management Indore (Madhya Pradesh) during June 09-11, 2023. The theme of the event is 'Organizations in Action: Digitalization and Sustainability in Management Practices'.

Organizations are constantly being evaluated based on the task environment, technological impact on the social structure, differentiation, and linkages of the individuals in the organization. Rapid technology change provides new methods for accessing processes within and outside organizational boundaries. Thus, organizations require sustainability in management processes in order to achieve and maintain a competitive advantage. The event aims to explore how organizations generate unique opportunities to strategically address challenges associated with the organization to ensure equitable and sustainable growth through developing and deploying smart technologies. The Tracks of the event are:

- Accounting and Finance.
- Economics and Public Policy.
- Business Policy and Strategic Management.
- Communication in Business.
- Data Science and Analytics.
- Entrepreneurship.
- Geopolitical Risks and Organization.
- Human Resource Management.
- Information Systems in Management.
- Marketing Management.
- Operations Management.
- Organizational Behaviour.
- Talent Management in Learning Organizations.

For further details, contact Coordinator, Mr. Ankit Rohilla, Indian Institute of Management Indore-453556 (Madhya Pradesh), Mobile: +91 8527304216, E-mail: *cere@iimidr.ac.in*. For updates, log on to: *https://www.iimidr.ac.in*

Training Programme on Research Methodology in Social Sciences

A twelve-day Training Programme on 'Research Methodology in Social Sciences' is being organized for M.Phil./Ph.D. Scholars of Indian universities, colleges and academic institutions and professionals working in the field of social development by the Council for Social Development (CSD), New Delhi during April 11-22, 2023. The target group of the programme is young social science researchers who are enrolled for M.Phil./Ph.D. in a UGC recognized university/deemed university/colleges/institutes of national importance and ICSSR Research Institutes and professions working in the field of social development. A batch of 30-35 participants will be selected on an all-India basis from various disciplines of social sciences.

The objective of the programme is to provide an understanding of various aspects of research methodology including research design, quantitative and qualitative methods, data preparation, empirical analysis, academic writing and interpretation. The programme seeks to i) discuss conceptual issues on emerging areas of social science research; ii) improve skills and the ability to undertake research on those issues using appropriate datasets, statistical tools and methods and estimation procedures; and iii) discuss the nature of research dissemination. The methodology programme will consist of lectures by eminent academicians, group discussions besides hands-on experience with datasets using statistical techniques. The Broad Themes of the Course are:

- Introduction to Social Science Research and Research Process, Theoretical Perspectives in

Social Science Research, Notions of Objectivity and Subjectivity in Social Science Research.

- Reviewing Literature.
- Qualitative and Quantitative Research Designs, Methods, and Instruments.
- Analysis and Interpretation of Quantitative and Qualitative Data as Well as Mixed Methods Research.
- Formulating Research Questions.
- Pre-requisites and Preparation for Qualitative and Quantitative Research, Research Ethics and Integrity.
- Tools for Data Collection, Interview Schedule and Questionnaire, Case Study and Observation.
- Principles and Techniques of Statistical Analysis.
- Statistical Tools and Statistical Packages for Social Sciences, MS Excel and Stata.
- Building Academic Writing Skills.

For further details contact Ms Jaya Nair, Council for Social Development (CSD), Sangha Rachana, 53 Lodi Estate, New Delhi-110003, Phone Nos: 011-24615383/24611700/24692655/24693065, E-mail: *jaya@csdindia.org/ csdnd@csdindia.org.* For updates, log on to*: www.csdindia.org.*

AIU News

ANVESHAN: Student Research Convention North Zone

The One-day North Zone Student Research Convention, *ANVESHAN* was organized by The Association of Indian Universities, New Delhi in collaboration with Desh Bhagat University, Mandi Gobindgarh, Punjab on February 22, 2023. More than 100 students from fifteen universities from the states of the north region of India participated in the event. A total of 52 innovative projects were showcased by the students and their mentors. Projects showcased in the event were indeed exemplary and were expected to have a significant impact on society.

The event started with a floral welcome of guests followed by traditional lamp lighting and the Desh Bhagat University anthem. The ceremonial dais was honoured by the august presence of Dr. Zora Singh, Chancellor, Desh Bhagat University, Dr. Tajinder Kaur, Pro Chancellor Desh Bhagat University, Prof. Rupinder Tewari, Mentor DST Technology Enable Centre (TEC), Punjab University Chandigarhas a Chief Guest, Dr Usha Rai Negi, Assistant Director, Research Division, AIU an Coordinator of *Anveshan* and Mr. Harsh, Indian Forest Services as Guest of Honour, Coordinator, Dr. Harsh Sadawarti, Vice President Desh Bhagat University, Dr. Virinder Singh, Vice Chancellor, Desh Bhagat University and Dr. L S Bedi, Dean, Academics, Desh Bhagat University.

Dr. L S Bedi, in his address introduced the University to the delegates. Dr. Harsh Sadawarti, in his inaugural speech, introduced the concept of *Anveshan:* Student Research Convention and expressed his gratitude towards the Association of Indian Universities for this opportunity to host this prestigious student research driven event dedicated to the promotion of innovation. He welcomed the guests and experts from various disciplines and delegates from all across the North Zone. Dr. Harsh Sadawarti, Vice President, Desh Bhagat University and Coordinator, North Zone Student Research Convention delivered the welcome note.

Dr. Usha Rai Negi, Assistant Director, AIU gave a brief background of *Anveshan:* Student Research Convention an annual flagship student research convention which includes the spirit of research culture in Higher Education Institutions (HEIs) to promote ideas in diverse fields ranging from Agriculture, Engineering, Health and Social Sciences to solve contemporary societal and technological challenges. She acknowledged the efforts of the host university and appreciated all the team members of the Organizing Committee of Desh Bhagat University for successfully organizing the Student Research Convention. She expressed her sincere thanks to all the people who directly or indirectly supported in making the event a huge success.

After tea break, in the first round, the contestants presented the registered 52 projects as posters in the prescribed size. Subject experts evaluated the participating projects in concerned areas based on stipulated parameters. After a thorough examination,

all the registered projects have been allowed for the next round of evaluation through Power-Point Presentation in front of judges. The projects were evaluated on parameters such as scientific principles, creativity, relevance, thoroughness, cost effectiveness, teamwork and skill followed by question-answer sessions. The participants were evaluated based on scientific thoughts & principles, creativity, thoroughness, skill, relevance, and teamwork. The team of distinguished evaluators scrutinized and declared first, second and third prizes in each theme. Winners were awarded mementoes and certificates in the valedictory ceremony that was overseen by Dr Usha Rai Negi, Assistant Director (R), AIU. All the winners were invited by Dr Negi to present their research in the upcoming *Anveshan*-National Student Research Convention which is to be organized under the aegis of AIU, New Delhi. During the valediction ceremony, Dr. H K Sidhu, Deputy Director, Agriculture Science announced the names of fifteen winners for the National level competition.

All participants received certificates of participation and the winners received special certificates of merits and mementoes. The concluding address was delivered by Dr. Jagdeep Kumar Sharma, Director, IEDC Desh Bhagat University. The event concluded with the National Anthem.

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

Agriculture

Participants	Institute Name	Name of the Project	Position
Mr. Veluru Sai Dheeraj Mr. Rishi Singh Mr. Tushar Sharma	Manav Rachna International Institute of Research and Studies	Improving Efficiency of Solar Dryer	**1st**
Mr. Tahir Ali Ritika Mansotra Ayushi Verma	University of Jammu, Jammu	Evaluation of Delivery Method of Bacillus sp. Strain D5 to Increase the Quality of Corm and Stigma of Saffron.	**2nd**
Ms. Jagriti Rajput Ms. Ritu	Desh Bhagat University	Morpho-Physiological and Biochemical Characteristics in Response to Calcium in Solanum tuberosum (Cash Crop of Punjab Region)	**3rd**

Basic Science

Participants	Institute Name	Name of the Project	Position
Mr. Bhaskar Banerjee	Sharda University	Development and in vitro Evaluation of Anticancer Molecules Containing Se, N and O Functionalities	**1st**
Ms. Avantika	Desh Bhagat University	Food and Feeding Behaviour of Avifaunal Communities In Agro-Ecosystems of Selected Villages in Bathinda District of Punjab, India	**2nd**
Ms. Yachna Ms. Anushtha	Manav Rachna International Institute of Research and Studies	Biosynthesis of Montbretin Utilising Synthetic Biology	**3rd**

Engineering and Technology

Participants	Institute Name	Name of the Project	Position
Mr. AadityaTaluja Mr. Himanshu Aggarwal Mr. Rohith Kandukuri	Manav Rachna International Institute of Research and Studies	Mittvaanee- voice of Soil	**1st**

Ms. Suruchi	GNA University	Smart Attendance Management System (SAMS)	**2nd**
Mr. Sudhanshu Sharma	Sharda University, Greater Noida, Uttar Pradesh	Ev- Kawach (Device To Protect Electric Vehicle from Getting in to the Fire and Take Some Actions Before it Happen to Save Lives)	**3rd**

Health Science

Participants	Institute Name	Name of the Project	Position
Ms. Devanshi Rajpurohit Ms. Neha Chauhan	Manav Rachna International Institute of Research and Studies	Plant Based Cheese	**1st**
Ms. Himani Vaswani	Swami Vivekananda Subharti University	To Compare the Efficacy of Botulinum Type A and i-PRF in Facial Rejuvination	**2nd**
Mr. Ankit Awasthi Ms. Riddhi Malhotra Ms. Rishika Awasthi	Lovely Professional University	Topical Application of a Novel Formulation Co-Administered with Probiotics to Enhance Healing Rate of Diabetic Wounds	**3rd**

Social Science

Participants	Institute Name	Name of the Project	Position
Mr. Sandeep	Kurukshetra University, Kurukshetra, Haryana	Site Suitability for Urban Solid Waste Disposal (A Case Study of Municipal Corporation Gurugram, Haryana)	**1st**
Ms. Harpreet Kaur	Desh Bhagat University	Promotion of Cultural Heritage & Women Empowerment in Punjab	**2nd**
Ms. Etika Saxena Mr. Ishank Popli	Lovely Professional University	hugg.co.in	**3rd**

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THESES OF THE MONTH

SOCIAL SCIENCES
A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of Dec 2022-Jan 2023)

AGRICULTURAL & VETERINARY SCIENCES

Agronomy

1. Asad, Mo. **Effect of different level of NPK in wheat (*Triticum aestivum* L) crop**. (Dr. Ravindra Nath), Department of Agronomy, Bhagwant University, Ajmer.

BIOLOGICAL SCIENCES

Life Science

1. Barge, Sagar Ramrao. **Phytochemical and pharmacological investigation of lysimachia Candida lindl for their anti-obesity activity via modulating adipose tissue differentiation and library screening of natural products for the new anti-obesity drug**. (Prof. Narayan Ch Talukdar), Department of Molecular Biology and Biotechnology, Cotton University, Guwahati.

2. Deb, Dibyayan. **Effect of traditional rice beer (Xaaj and Joubishi) on gut microbiota of Ahom and Bodo Communities of Assam**. (Dr. Mojibur R Khan), Department of Molecular Biology and Biotechnology, Cotton University, Guwahati.

3. Ehtram, Aquib. **Investigation of the role of ESX5 associated mycobacterium tuberculosis PE18 and PPE26 proteins during the host-pathogen interplay**. (Prof. Seyed E. Hasnain and Prof. Vivekanandan Perumal), Kusuma School of Biological Sciences, Indian Institute of Technology Delhi, New Delhi.

4. Goswami, Madhurankhi. **Potentiality of biosurfactant producing microbes in plant growth promotion and inhibition of phytopathogenic fungi**. (Dr. Suresh Deka), Department of Molecular Biology and Biotechnology, Cotton University, Guwahati.

5. Mehmud, Selim. **Taxonomy and distribution of the family arecaceae in Assam**. (Dr. Himu Roy), Department of Botany, Cotton University, Guwahati.

6. Piplani, Bakul. **Elucidating the protein folding function of the mycobacterium tuberculosis & mycobacterium marinum chaperonin systems**. (Prof. Tapan Kumar Chaudhuri), Kusuma School of Biological Sciences, Indian Institute of Technology Delhi, New Delhi.

7. Srivastava, Shikha. **Investigating the role of signal transducer and activator of transcription 3 (STAT3) in dengue virus propagation**. (Prof. Ashok Kumar Patel), Kusuma School of Biological Sciences, Indian Institute of Technology Delhi, New Delhi.

Microbiology

1. Joshi, Hemant Kumar. **Pathogenic E-Coli in fresh produce: A microbiological analysis**. (Prof. Purnima Shrivastava), Department of Microbiology, Bhagwant University, Ajmer.

Zoology

1. Chetri, Suraj. **Evaluation of efficacy of selected plant extracts for the control of callosobruchus Chinensis L**. (Dr. Rezina Ahmed), Department of Zoology, Cotton University, Guwahati.

2. Harish. **Studies on cadmium induced toxicity in testicular germ cells of goat (*Capra hircus*) in vitro**. (Dr. Jitender Kumar Bhardwaj), Department of Zoology, Kurukshetra University, Kurukshetra.

EARTH SYSTEM SCIENCES

Atmospheric Science

1. Singh, Vivek Kumar. **Improvement in land surface parameters in mesoscale numerical modelling for assessment of industrial heat island**. (Prof. Manju Mohan), Centre for Atmospheric Science, Indian Institute of Technology Delhi, New Delhi.

ENGINEERING SCIENCES

Biochemical Engineering

1. Varshney, Swati. **Studies on bacterial diversity on fabrics**. (Dr. Shilpi Sharma and Prof. Deepti Gupta), Department of Biochemical Engineering and Biotechnology, Indian Institute of Technology Delhi, New Delhi.

Biogas Technology and Mechanism

1. Himanshu Kumar. **Studies on utilization atmosphere of bio-CO_2 in grain storage as a Controlled Atmosphere (CA) and crop cultivation in greenhouse**

with atmospheric bio-CO_2 fertigation. (Prof. V.K Vijay and Prof. P M V Subbarao), Centre for Rural Development & Technology, Indian Institute of Technology Delhi, New Delhi.

Chemical Engineering

1. Choudhary, Neelam. **Flow dynamics in gas hydrate reservoirs**. (Prof. Jyoti Phirani and Prof. Somnath Ghosh), Department of Chemical Engineering, Indian Institute of Technology Delhi, New Delhi.

2. Jangir, Pooja. **Studies on miscible viscous fingering in polymeric and nanofluids**. (Prof. Ratan Mohan and Prof. Paresh P. Chokshi), Department of Chemical Engineering, Indian Institute of Technology Delhi, New Delhi.

3. Kalia, Shweta. **Studies on fungi mediated solutions for fabric desizing and dye degradation in textile industries**. (Prof. Anushree Malik), Centre for Rural Development & Technology, Indian Institute of Technology Delhi, New Delhi.

4. Naaz Farah. **Hydrothermal conversion of wastewater grown algal biomass into value added products and investigations on the effects of heavy metals on products**. (Prof. Anushree Malik and Prof. Kamal K. Pant), Centre for Rural Development & Technology, Indian Institute of Technology Delhi, New Delhi.

5. Sarma, Satirtha Kumar. **Synthesis and photoelectrochemical characterization of hematite based photoanodes and CFD simulation studies in water splitting**. (Prof. Ratan Mohan and Prof. Anupam Shukla), Department of Chemical Engineering, Indian Institute of Technology Delhi, New Delhi.

Civil Engineering

1. Birla, Sandhya. **A novel hybrid model development for the estimation of plume length**. (Prof. B.R. Chahar, Prof. Liedl, Neubau Chemie and Prof. P K Yadav), Department of Civil Engineering, Indian Institute of Technology Delhi, New Delhi.

2. Nanyam, Venkata Padma Sai Nihar. **Conceptual model for analysing the operational performance of Indian container terminals**. (Prof. K.N. Jha), Department of Civil Engineering, Indian Institute of Technology Delhi, New Delhi.

3. Pareek, Prahlad. **Analysis and design of R C C overground tank and towers with spherical dome using seismic effect**. (Dr. Dharmendra Kumar Dubey and Dr. Prashant Kumar Gangwar), Department of Civil Engineering, Bhagwant University, Ajmer.

4. Sinha, Mukund Kumar. **Evaluating public private partnership in metro rail in India**. (Prof. V.Upadhyaya and Prof. G. Tiwari), Transportation Research and Injury Prevention Centre, Indian Institute of Technology Delhi, New Delhi.

Computer Science & Engineering

1. Gupta, Kishu. **Deployment of data leakage detection and prevention for data security**. (Dr. Ashwani Kush), Department of Computer Science & Engineering, Kurukshetra University, Kurukshetra.

2. Jain, Prachi. **Language, structure, time aware knowledge base completion**. (Prof. Mausam and Prof. Soumen Chakarabarti), Department of Computer Science & Engineering, Indian Institute of Technology Delhi, New Delhi.

3. Sagaya Mary, J. **Computer vision based Indian sign language recognition using deep learning**. (Dr. Nachamai M), Department of Computer Science, Christ University, Bangalore.

4. Yadav, Arun Kumar. **Energy aware and secured routing for MANET in disaster situations**. (Dr. Ashwani Kush), Department of Computer Science, Kurukshetra University, Kurukshetra.

Electrical & Electronics Engineering

1. Biswas, Kamal. **Efficient techniques for broadcast of in-band system information in massive MIMO systems**. (Prof. Saif Khan Mohammed), Department of Electrical & Engineering, Indian Institute of Technology Delhi, New Delhi.

2. Chandran, Vineet P. **Power management of PMSG based micro hydro system integrated with battery and PV based solar system**. (Prof. Bhim Singh), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

3. Chawla, Astha. **Cyber-attack resilient design of wide area measurement systems in smart grid GRID**. (Prof. B.K. Panigrahi), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

4. Kashyap, Rajesh. **Development of polyaniline and ferrite based composite for gas sensing applications**. (Dr. Dinesh Kumar and Dr. Sachin Tyagi), Department of Electronic Science, Kurukshetra University, Kurukshetra.

5. Kaushik, Pragyey Kumar. **Modeling and simulation of bias dependent behavior in GaN HEMT for RF applications**. (Prof. Ankur Gupta and

Prof. Ananjan Basu), Centre for Applied Research and Electronics, Indian Institute of Technology Delhi, New Delhi.

6. Khan, Khusro. **Design and development of high efficiency three phase induction motors for solar water pumping and other applications**. (Prof. Bhim Singh), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

7. Ramesh, Akhil K. **Interface engineering in CoFeB-based spintronic devices for sensing and memory applications**. (Prof. Prof. Pushaparaj Singh and Prof. Yuan-Chieh Tseng), Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, New Delhi.

8. Upadhyay, Kamini. **Blood vessel and red lesion segmentation for early diabetic retinopathy screening**. (Prof. Monika Aggarwal and Prof. Praveen Vashist), Centre for Applied Research and Electronics, Indian Institute of Technology Delhi, New Delhi.

Energy Studies

1. Alok Singh. **Studies on thermal performance evaluation of box type solar cookers**. (Prof. S.C.Mullick and Prof. T.C, Kandpal), Department of Energy Science & Engineering, Indian Institute of Technology Delhi, New Delhi.

Material Science and Engineering

1. Chetan Singh. **Development of novel Mg-Ca-Sc alloys as potential biodegradable implant material**. (Prof. Jayant Jain), Department of Materials Science and Engineering, Indian Institute of Technology Delhi, New Delhi.

Mechanical Engineering

1. Khawar, Obaidullah. **Numerical investigation of control strategies in turbulent taylorcouette flows**. (Prof. Sanjeev Sanghi and Prof. M.F. Baig), Department of Applied Mechanics, Indian Institute of Technology Delhi, New Delhi.

2. Chatterjee, Abhinava. **Nanotribology and nanomechanics of human articular cartilage interfaces using molecular dynamics simulations**. (Prof. Devendra K Dubey and Prof. Sujeet K. Sinha), Department of Mechanical Engineering, Indian Institute of Technology Delhi, New Delhi.

3. Jayakrishna, Pedduri. **Analysis of thermo-mechanical phenomena and heat transfer characterization in continuous casting**. (Prof. Prabal Talukdar and Prof. Suvankar Ganguly), Department of Mechanical Engineering, Indian Institute of Technology Delhi, New Delhi.

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Textile Technology

1. Bajya, Mukesh. **Development of soft body armour by using different high-performance materials**. (Prof. Abhijit Majumdar and Prof. Bhupendra Singh Butola), Department of Textile and Fibre Engineering, Indian Institute of Technology Delhi, New Delhi.

MATHEMATICAL SCIENCES

Mathematics

1. Agarwal, Raksha. **Multi-document abstractive text summarization using multi-sentence compression and text simplification**. (Prof. Nidadri Chatterjee), Department of Mathematics, Indian Institute of Technology Delhi, New Delhi.

2. Piroja Begum. **A study of some steady and unsteady flow problems with or without magnetic field**. (Prof. Dipak Sarma), Department of Mathematics, Cotton University, Guwahati.

3. Yadav, Vikasdeep. **Analysis and modelling of inventory models under uncertainty**. (Dr. A K Malik and Dr. B K Chaturvedi), Department of Mathematics, Bhagwant University, Ajmer.

Statistics

1. Saini, Sapna. **Profit analysis of steel industry by using supplementary variable technique**. (Dr. Jitender Kumar), Department of Statistics, Kurukshetra University, Kurukshetra.

MEDICAL SCIENCES

Pharmaceutical Science

1. Bansode, Santosh Shivaji. **Formulation, phytochemical studies and pharmacological screening of Martynia Annua leaves**. (Dr. Santosh B Dighe), Department of Pharmaceutical Science, Bhagwant University, Ajmer.

2. Shaikh, Shoheb Shakil. **Stability indicating assay method development and validation for simultaneous estimation of Pioglitazone, Glimepiride and metformin hydrochloride in bulk and tablet dosage form by UV, RP- HPLC, FTRIR and LC-MS**.

(Dr. Santosh B Dighe), Department of Pharmaceutical Science, Bhagwant University, Ajmer.

3. Shinde, Kiran Kashinath. **Stability indicating assay method development and validation for simultaneous estimation of voglibose, glimepiride and metformin hydrochloride in bulk and tablet dosage form by UV, RP- HPLC, FTRIR and LC-MS**. (Dr. Santosh B Dighe), Department of Pharmaceutical Science, Bhagwant University, Ajmer.

4. Verma, Priya. **Process optimization of enteric coating of Hpmc-As on rabeprazole sodium tablet**. (Dr. Ravindra B Laware), Department of Pharmacy, Bhagwant University, Ajmer.

PHYSICAL SCIENCES

Chemistry

1. Dhingra, Likhish. **Thermodynamic and physicochemical studies of binary liquid mixtures containing alkoxy alkanols and amines**. (Dr. Gyan Prakash Dubey), Department of Chemistry, Kurukshetra University, Kurukshetra.

2. Hore, Soumyadip. **Dehydrogenative C-C and C-P bond formation: Direct access towards polyarylquinones, axially chiral Bi-aryls, phosphorylated (Hetero)- areness**. (Prof. Ravi P Singh), Department of Chemistry, Indian Institute of Technology Delhi, New Delhi.

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

4. Vinod Kumar. **Thermal, mechanical and biodegradation studies of polymer composites**. (Dr. Sohan Lal), Department of Chemistry, Kurukshetra University, Kurukshetra.

Physics

1. Dhawan, Rajat. **Investigations of sheath formation during plasma-surface interaction**. (Prof. H.K Malik), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

2. Dwivedi, Manish. **Channel formation and stimulated Raman scattering during laser-plasma interaction**. (Prof. Hitendra K Malik), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

3. Hait, Soumyarup. **Growth and investigation of the magnetic properties of co-based heusler and amorphous alloy stacked with heavy metals and 2d-material for spintronic applications**. (Prof. Sujeet Chaudhary), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

4. Patranabish, Sourav. **Studies on the namatic phases of flexible and rigid bent-core liquid crystals-extension to polymers for energy harvesting applications**. (Prof. Aloka Sinha), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

5. Samanta, Krishnendu. **Tailoring excitation strategies for structured illumination microscopy**. (Prof. Joby Joseph), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

6. Sapna Kumari. **Structural, dielectric and ferroelectric properties of lead-free perovskite ferroelectric ceramics**. (Dr. Vijay Kumar), Department of Physics, Kurukshetra University, Kurukshetra.

7. Shukla, Vineet Kumar. **Postselection-free, entangled biphoton states from integrated waveguide devices in potassium titanyl phosphate**. (Prof. Joyee Ghosh), Department of Physics, Indian Institute of Technology Delhi, New Delhi. ❐

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Candidates having knowledge of Marathi will be preferred.

"Qualification, Pay Scales and other requirement 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.

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- Initiated Chhattisgari language as official language on notesheets
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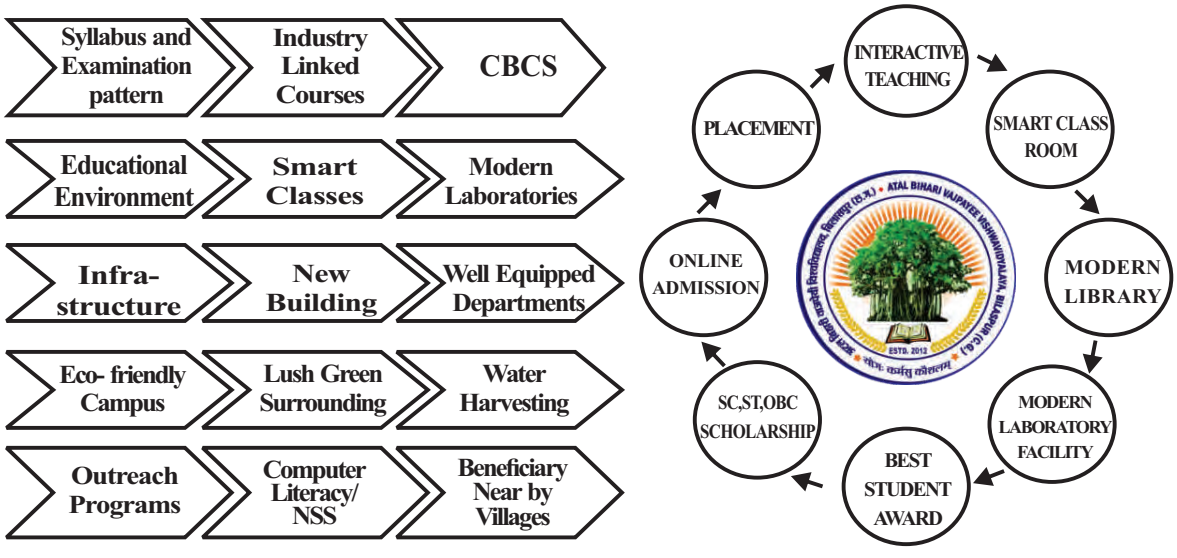

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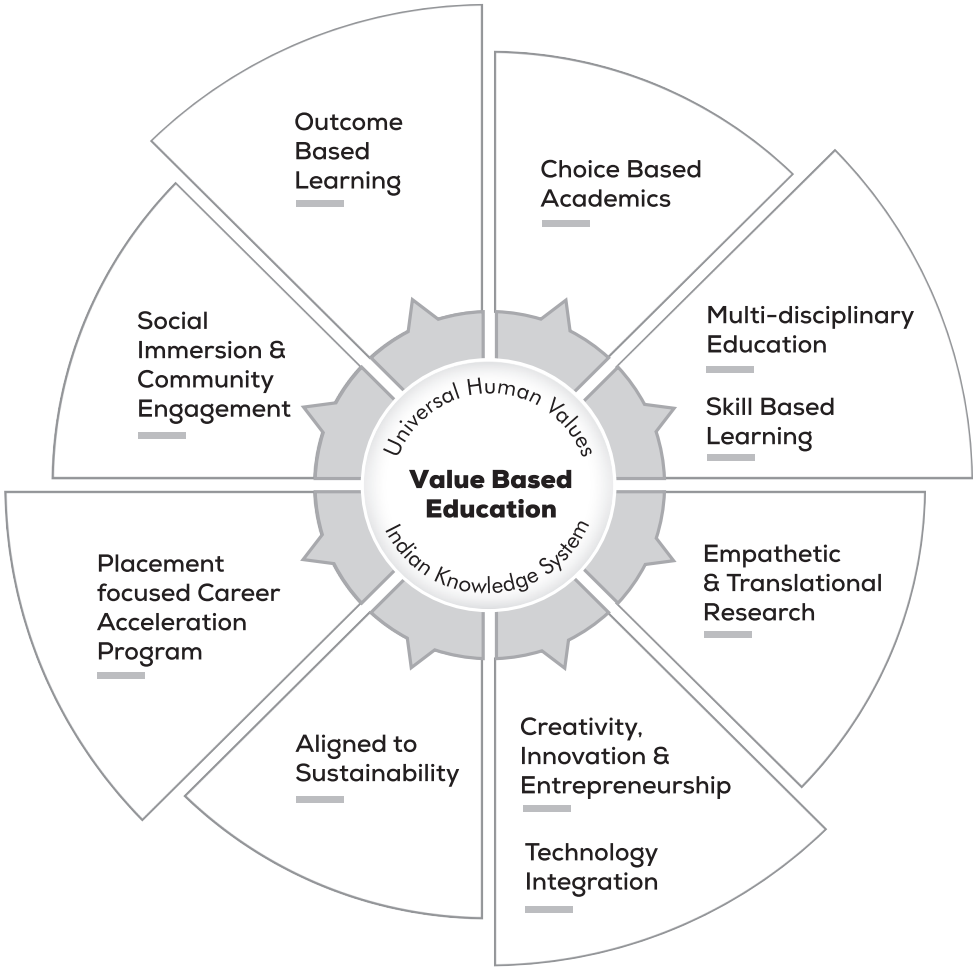

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■ Dental College & Hospital, Pune, Navi Mumbai and Sangli	B.D.S. M.D.S. (8 Specialities)
■ College of Ayurved, Pune	B.A.M.S., P.G. Diploma M.D./M.S. (Ayurved) (7 Specialities)
■ Homoeopathic Medical College, Pune	B.H.M.S. M.D. Homoeopathy (5 Specialities)
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■ Nursing College, Pune, Sangli & Navi Mumbai	B.Sc. (Nursing), Post Basic B.Sc. (Nursing) M.Sc. (Nursing) (5 Specialities)
■ College of Engineering, Pune NIRF - 2021 Rank 96	B.Tech. (12 Specialities) M.Tech. (8 Specialities)
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■ Department of Law, New Delhi	LL.B. (3 Years), B.B.A. LL.B. (5 Years)
■ Yashwantrao Mohite College of Arts, Science and Commerce, Pune	B.A. (2 Specialities), B.Sc. (6 Specialities) B.Com. B.Lib. & I.Sc. M.Sc. (4 Specialities), M.Com. M.A. (2 Subjects), M.Lib. & I.Sc.
■ School of Visual Arts	Bachelor of Visual Arts (Applied Arts)
■ Social Sciences Center, Pune, Solapur	M.S.W.
■ Rajiv Gandhi Institute of Information Technology & Biotechnology, Pune	B.Sc. Biotechnology M.Sc. Biotechnology (3 Specialities) Advance Diploma in Bioinformatics
■ School of Optometry, Pune, Sangli	B.Optom., M.Optom.
■ School of Audiology & Speech Language Pathology, Pune	B.A.S.L.P, M.Sc. (Audiology) M.Sc. (Speech Language Pathology)
■ College of Physical Education, Pune	B.A. (Physical Education and Sports) B.P.Ed., M.P.Ed., M.Phil. (Physical Education)
■ Institute of Environment Education and Research, Pune	M.Sc. (Environment Science) (2 Specialities)
■ Centre for Health Management, Pune	MHA (Master in Hospital Administration), PGDHM
■ College of Architecture, Pune	B.Arch., M.Arch. (2 Specialities)
■ Hotel Management and Catering Technology, Pune	B.H.M.C.T. (Bachelor of Hotel Management & Catering Technology) B.Sc. H&HA (Bachelor in Science Hospitality Management and Hotel Administration)
■ Department of Photography, Pune	B.A. (Commercial Photography) B.A. (Photography & Cinematography)
■ School of Performing Arts, Pune	B.A. (Music), B.A. (Dance), M.A. (Music), M.A. (Dance) Diploma in Kirtan (Naradiya & Varkari Styles)
■ School of Physiotherapy, Pune & Sangli	B.P.T.h.
■ School for Skill Development and Allied Health Sciences, Pune	B.Sc. (14 Specialities), PG Dipl. (9 Specialities), Certificate (12 Specialities)


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BLDE

(DEEMED TO BE UNIVERSITY)
Declared as Deemed to be University u/s 3 of UGC Act, 1956
Accredited with "A" Grade by NAAC (Cycle - 2)
THE CONSTITUENT COLLEGE

SHRI B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

Smt. Bangaramma Sajjan Campus, Dr. B. M. Patil Road, (Sholapur Road), Vijayapura - 586103, Karnataka, India.

Accreditations

3.09 CGPA | TOP 50 Medical College | INDIA TODAY 11th Rank | PERFORMER | EducationWorld 7th Rank

BLDE (Deemed to be University) is a single-faculty Health Sciences University established in 2008 in Northern Karnatka, with '*Shri B. M. Patil Medical College, Hospital & Research Centre*' as its constituent unit (Est. 1986). The Sponsoring Society, BLDE Association, is a 112-year-old Education Society running more than 83 Institutions. The varsity came into existence with the sole objective of providing quality Medical Education and meeting the healthcare needs of the people in this backward region of North Karnataka. It has a unitary campus of 71.2 acres with 26 departments and a teaching hospital with 1338 beds, also accredited by NABH at Entry Level and the labs are NABL accredited.

The varsity has been assessed by NAAC and accredited 'A-Grade' with a CGPA of 3.09, included in the NIRF Rank Band: 101-150, for the year 2022, Atal Ranking of Institutions on Innovation Achievements (ARIIA) recognised it in the band of 'PERFORMER', and India Today Survey 2022, ranked BLDE (DU) 11th among the Medical Universities in India.

Programmes Offered

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Graduate Programmes
- MBBS

Post Graduate Programmes:
MD/MS
- Human Anatomy
- Human Physiology
- Biochemistry
- Pathology
- Microbiology
- Pharmacology
- Forensic Medicine
- Community Medicine
- General Medicine
- Paediatrics
- Dermatology
- General Surgery
- Orthopedics
- Anaesthesiology
- Otorhinolaryngology (ENT)
- Ophthalmology
- Obst. & Gynecology
- Radiology
- Psychiatry
- Respiratory Medicine
- Emergency Medicine
- Geriatrics

Super Speciality
- M.Ch. (Urology)
- D.M (Cardiology)

M.Sc. (Medical):
- Anatomy
- Physiology
- Biochemistry
- Pharmacology
- Microbiology

Faculty of Allied Health Sciences

Graduate Programmes:
- BBA Hospital & Health System Management
- Bachelor of Physiotherapy (BPT)
- Bachelor of Public Health (BPH)

Biomedical (B.Sc.)
- Medical Imaging Technology (MIT)
- Medical Laboratory Technology(MLT)
- Anaesthesia Technology
- Operation Theater Technology
- Respiratory Care Technology
- Cardiac Care Technology
- Perfusion Technology
- Emergency Medicine Technology
- Optometry
- Forensic Science
- Clinical Genetics
- Audiometry(Audiology)
- Health Information Managment

Life Science:(B.Sc)
- Biotechnology
- Microbiology
- Biochemistry
- Food, Nutrition and Dietetics

Post Graduate Programmes:
- M.Sc. in Clinical Immunology
- Master of Public Health(MPH)
- Master of Hospital Administration (MHA)

Doctoral Programmes (Ph.D):
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- Physiology
- Biochemistry
- Pharmacology
- Pathology
- Microbiology
- Forensic Medicine
- Community Medicine
- Ophthalmology
- Otorhinolaryngology (ENT)
- General Medicine
- General Surgery
- Obstetrics & Gynecology
- Orthopedics
- Pediatrics
- Dermatology
- Aneasthesiology
- Phsychiatry
- Emergency Medicine
- Radiology
- Respiratory Medicine
- Pharmacy
- Nursing
- Ayurveda
- Genetics
- Biotechnology
- Life Sciences
- Hospital Administration
- Public Health
- Medical Physics /Biophysics

Fellowship Programmes in :
- Neonatology
- Minimal Access Surgery
- Endoscopic Sinus Surgery (FESS)
- Functional Micro-Ear Surgery(FMES)
- Dermatopathology
- Pediatric Urology
- Pediatric Dermatology

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- Histology Techniques
- Museum Techniques
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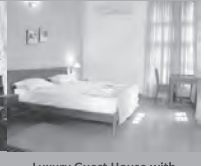
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हिमाचल प्रदेश केंद्रीय विश्वविद्यालय

(केंद्रीय विश्वविद्यालय अधिनियम 2009 के अधीन स्थापित)

1. **परिचय :** केंद्रीय विश्वविद्यालय अधिनियम 2009 के अंतर्गत स्थापित विश्वविद्यालय ने अपना कार्य 20 जनवरी, 2010 से प्रारंभ किया ।
2. **परिसर :** वर्तमान में, विश्वविद्यालय की शैक्षणिक गतिविधियाँ धर्मशाला (शाहपुर सहित) और देहरा में शैक्षणिक खंडों से चल रही हैं, जबकि प्रशासनिक कार्यालय धर्मशाला में स्थित है। कांगड़ा, देहरा एवं धर्मशाला स्थित किराए के भवनों से क्रमशः छात्र और कन्या छात्रावास चलाये जा रहे हैं। अधिकांश छात्र-छात्राएँ आसपास के इलाकों में पेइंग गेस्ट के रूप में रह रहे हैं। अधिकांश शिक्षक और कर्मचारी परिसरों के आसपास किराए के आवास में रह रहे हैं। विश्वविद्यालय के शैक्षणिक खंड नवोन्नत लेक्चर थियेटर, सेमिनार कक्ष, सम्मेलन कक्ष, कार्यालय स्थल/वर्कस्टेशन, संकाय कक्ष, प्रयोगशाला और आईटी अवसंरचना से युक्त किए जा रहे हैं । यह वर्तमान कार्यक्रमों को संचालित करने के लिए पर्याप्त मात्र है।
3. **आईटी अवसंचरना :** विश्वविद्यालय के शाहपुर परिसर (धर्मशाला) में 1 जीबीपीएस एनकेएन कनेक्टिविटी और कैंप कार्यालय में 4 एमबीपीएस कनेक्टिविटी की सुविधा उपलब्ध है । अन्य परिसर बीएसएनएल एफटीटीएच के माध्यम से एनकेएन कनेक्टिविटी से युक्त हैं । परिसर पूर्णतः लैन तथा कैंपस कनेक्ट के अंतर्गत वाई-फाई युक्त हैं । यह वीडियो कंफ्रेंसिंग सुविधा से सुसज्जित हैं ।
4. **पुस्तकालय और सूचना संसाधन :** विश्वविद्यालय के शैक्षणिक खंड, धर्मशाला एवं देहरा में क्रमशः आचार्य रघुवीर पुस्तकालय एवं प्रो. एस. आर. रंगनाथन पुस्तकालय नामक दो कार्यशील ओपन एक्सेस पुस्तकालय स्थित हैं । वेबसाइट में ई-संसाधनों के लिंक पहले ही उपलब्ध कराए गए हैं। ई-लर्निंग संसाधन उपलब्ध कराने के लिए इसे और विकसित किया जा रहा है। पुस्तकालय के पास ऑनलाइन जर्नलों को पढ़ने के लिए इनफ्लिबनेट सुविधा उपलब्ध है। वर्ष 2010 में स्थापना के बाद क्रमिक तौर पर विश्वविद्यालय पुस्तकालय द्वारा पुस्तकों के संग्रहण, जर्नलों के अभिदान और इलेक्ट्रॉनिक संसाधनों को तेजी से बढ़ाया जा रहा है। वर्तमान में पुस्तकालय में 36134 पुस्तकें, 07 धारावाहिक प्रकाशन और 1601 दान में प्राप्त पुस्तके हैं।
5. **अध्ययन कार्यक्रम :** विश्वविद्यालय द्वारा वर्तमान में विभिन्न बारह स्कूलों के अंतर्गत तैंतीस शिक्षण विभाग/केंद्र एवं 03 पीठ प्रारंभ किए गए हैं जिनके अंतर्गत 05 स्नातक (यूजी), 28 स्नातकोत्तर (पीजी), 29 अनुसंधान डिग्री (आरडी), 02 बी.वोक. कार्यक्रम, 13 पीजी डिप्लोमा पाठ्यक्रम और 19 सर्टिफिकेट अध्ययन कार्यक्रम चलाए जा रहे हैं / प्रस्तावित हैं ।
6. **विद्यार्थियों का नामांकन :** 31 मार्च, 2022 के अनुसार विश्वविद्यालय में 2194 विद्यार्थी नामांकित थे। विद्यार्थियों का संघटन : यूजी 268, पीजी 1353, पीजी डिप्लोमा 37, सर्टिफिकेट 41, एम. फिल. 14 और आरडी 481 हैं । इनमें से महिलाएं 1088 (49.58 प्रतिशत) थीं । सामाजिक संघटन : अनु.जाति 357 (16.27 प्रतिशत), अनु. जनजाति 175 (7.97 प्रतिशत), अन्य पिछड़ा वर्ग 487 (22.19 प्रतिशत) और आर्थिक रूप से कमजोर वर्ग 149 (6.79 प्रतिशत)।
7. **ऑनलाइन आवेदन :** प्रवेश और भर्ती प्रपत्रों के लिए विश्वविद्यालय द्वारा शिक्षा मंत्रालय के समर्थ ईगॉव सुईट के माध्यम से ऑनलाइन आवेदन प्रक्रिया अपनाई गई है और भुगतान को ऑनलाइन ही प्राप्त किया जा रहा है।
8. **उल्लेखनीय कार्यक्रम :** हिमाचल प्रदेश केंद्रीय विश्वविद्यालय द्वारा दिनांक 10 जून, 2022 को तात्कालीन राष्ट्रपति श्री रामनाथ कोविंद जी की गरिमामयी उपस्थिति में छठे दीक्षांत समारोह का आयोजन किया, जिसमें विभिन्न पाठ्यक्रमों के कुल 486 छात्रों को डिग्रियां आवंटित की गईं, जिनमें 69 मेधावी छात्रों को गोल्ड मेडल तथा 46 शोधार्थियों को डॉक्टरेट की उपाधि प्रदान की गई। विश्वविद्यालय द्वारा दिनांक 21 जून, 2022 को आठवें अंतर्राष्ट्रीय योग दिवस का आयोजन ऐतिहासिक कांगड़ा किले में किया गया। कार्यक्रम में केन्द्रीय शिक्षा मंत्री श्री धर्मेन्द्र प्रधान बतौर मुख्यातिथि उपस्थित थे।

हिमाचल प्रदेश केंद्रीय विश्वविद्यालय में चल रहे अध्ययन कार्यक्रम- यूजी, पीजी, पीजी डिप्लोमा, सर्टिफिकेट कोर्स

यूजी - बी.एससी. भौतिकी, बी.ए. (संस्कृत), बी.ए. (शास्त्री), बीएफए (चित्रकला), बीएफए (मूर्तिकला), बी.वोक. (जनसंचार), बी.वोक. (वित्तीय एवं मार्केटिंग सेवाएं **पीजी -** एम.एससी. भौतिकी, एम.एससी. रसायनशास्त्र, एम.एससी. (कंप्यूटेशनल जीव विज्ञान / जैव सूचना विज्ञान), एम.एससी. (बॉटनी), एम.एससी. (जूलॉजी), एम.एससी. (पर्यावरण विज्ञान), एम.एससी. गणित, एमसीए (मास्टर ऑफ़ कंप्यूटर एप्लीकेशन्स), बी.लिब. साइंस (एक वर्षीय पीजी कार्यक्रम), एम.लिब. साइंस (एक वर्षीय पीजी कार्यक्रम), एम.ए. (अंग्रेजी), एम.ए. (हिंदी), एम.ए. (संस्कृत), एम.ए. (पंजाबी), एम.ए. (हिंदू अध्ययन), एम.ए. (अर्थशास्त्र) एम.ए. (राजनीति विज्ञान), एम.ए. (इतिहास), एमएसडब्ल्यू, एम.ए. (समाजशास्त्र एवं समाज नृविज्ञान), एम.ए. (जम्मू तथा कश्मीर), एम.ए. (शिक्षा), एमबीए (व्यॉवसाय प्रबंधन), एमबीए (पर्यटन एव यात्रा में विशेषज्ञता), एमएफए (चित्रकला), एमएफए (मूर्तिकला), एम.ए. (पत्रकारिता एवं जनसंचार), एम.ए. (नव मीडिया) **पीजी डिप्लोमा -** योग अध्ययन, हिंदू अध्ययन, जम्मू तथा कश्मीर अध्ययन, दीन दयाल उपाध्याय अध्ययन, अम्बेडकर अध्ययन, जनजातीय अध्ययन, भारतीय विदेश नीति, कार्यक्रम प्रबंधन पाठ्यक्रम (पीजीडीईएम), आपदा प्रबंधन, तिब्बती अध्ययन, अनुवाद, जैव सूचना विज्ञान, भारतीय विदेश नीति में पीजी डिप्लोमा **कार्यक्रम सर्टिफिकेट**- मशरुम कल्टीवेशन, एपीकल्चर एवं सेरीकल्चर, वैदिक गणित, पंजाबी, अमेरिकी जनजातीय साहित्य, योग अध्ययन, गुर्जर इतिहास एवं संस्कृति, भारतीय संस्कृति एवं विरासत, समाज कार्य के उभरते क्षेत्र, कश्मीरी भाषा (शारदा लिपि), डाटा पत्रकारिता, समाचार प्रस्तुति, जलकृषि, भारतीय विदेश नीति, व्यक्तित्व विकास और संचार कौशल, जैवपदार्थ रसायनशास्त्र, इलेक्ट्रिकल सर्किट और इलेक्ट्रॉनिक उपकरणों की भौतिकी, कृत्रिम बोध युक्त मात्रात्मतक अभिक्षमता, विषयवस्तुक प्रबंधन प्रणाली और अनुप्रयोग (सिद्धांत और अभ्यारस) में सर्टिफिकेट कार्यक्रम।

हिमाचल प्रदेश केंद्रीय विश्वविद्यालय शोध के क्षेत्र में नई पहचान हासिल को प्रयासरत है। इसी क्रम में विश्वविद्यालय ने वित वर्ष 2021-22 में राष्ट्रीय-अंतरराष्ट्रीय स्तर पर विभिन्न शैक्षणिक संस्थानों और उद्यमियों के साथ 25 से अधिक समझौता ज्ञापन पर हस्ताक्षर किए।

केंद्रीय विश्वविद्यालय ने पहली बार एआईयू के तत्वावधान में राष्ट्रीय स्तर पर मार्च 2022 में दो खेलों आल इंडिया नेटबॉल (महिला), खो-खो (पुरूष) – इंटर जोनल प्रतियोगिताओं का आयोजन करवाया । मार्च 2023 में ऑल इंडिया इंटर-यूनिर्वसिटी पॉवर लिफ्टिंग टूर्नामेंट (वूमैन) की मेजबानी की।

पता : कुलपति सचिवालय, एचपीसीए क्रिकेट स्टेडियम के निकट, धर्मशाला, जिला कांगड़ा (हि.प्र.)- 176215
दूरभाष : 01892-229330, ईमेल : **vc@hpcu.ac.in**

DAMODARAM SANJIVAYYA NATIONAL LAW UNIVERSITY
Visakhapatnam, Andhra Pradesh, India

ABOUT THE UNIVERSITY : Damodaram Sanjivayya National Law University (DSNLU) was established in the year 2008 by the Government of Andhra Pradesh at Visakhapatnam through DSNLU Act, 2008 to impart quality legal education. The University is recognized u/s 2(f) and 12B of UGC Act 1956 and has the recognition of the BCI.

MISSION : DSNLU is committed to design and deliver legal education, promote academic achievement and excellence in legal research.

VISION : DSNLU endeavours to be a premier law school with state-of-the-art facilities with emphasis on clinical aspects to promote and provide world class education, training, research consultancy and services.

ACADEMICS : The University offers Five Year Integrated B.A., LL.B. (Hons.) and One year LL.M. The academic year is divided into two semesters: The Monsoon Semester (July-November) and the Spring Semester (January-May). Students are required to complete 220 credits before they become eligible to graduate. Each of the credit courses involves 60 hours of the classroom teaching.

ADMISSIONS:

i) **Eligibility:** DSNLU is governed by CLAT 2021 notification as regards eligibility criteria.
ii) **Intake:**

5 Year Integrated B.A, LL.B., (Hons.) - 120 seats + 18 Extra Seats* (total– 138 seats)
One Year LL.M. - Commercial Laws - 24 seats + 3 Extra Seats* (total -27seats)

INFRASTRUCTURE FACILITIES: DSNLU state-of-the-art, technologically advanced and eco-friendly campus is situated in 45.5 acres abutting the hill. DSNLU campus has fully air-conditioned Academic Block, Wi-Fi enabled with LAN facility. The University is a part of National Knowledge Network whereas the Government of India has provided 1GBPS connectivity to the University. Boys and Girls Hostels consists of 160 rooms each with 2 students accommodation in a room as per the University Rules. DSNLU has canteen building accommodating 350 students at a time. DSNLU has 11 KV Sub-station with two 320 KVA backup generators, 1.5 KLD capacity Sewage Treatment Plant, Andhra Bank ATM. 350 Kwp Roof Top Solar Power Plant is also established. The students are facilitated with a world-class library which provides access to online resources like Westlaw India, Hein Online, SCC online, Lexis Nexis, Kluwer Competition Law, Kluwer IP Law, Kluwer Arbitration, Taxmann, JSTOR, Economic and Political Weekly and Manupatra for intensive research. The online resources are available through RemoteXs. Further, DSNLU adopts Turnitin, an anti-plagiarism web tool. All the classrooms are equipped with LCD projectors, internet and public address system. DSNLU Moot Court Hall is a splendor in its own way. The University has seminar and conference hall that are made available for conducting meetings and organizing guest lectures.

Dr. B. R. Ambedkar Open University

Prof. G. Ram Reddy Marg, Road No. 46, Jubilee Hills, Hyderabad - 500 033, Telangana State, India
Phone: 040-23680 000 (25 Lines), Web: www.braou.ac.in, www.braouonline.in

PROGRAMMES ON OFFER

(A) Research Programmes

1. **Ph.D 15 Departments**

   English, Hindi, Telugu, Commerce, Education, Chemistry, Environmental Science, Mathematics, Physics, Economics, History, Library and Information Science, Political Science, Public Administration and Sociology

(B) Master's Programmes

1. M.A. Economics (TM)
2. M.A. History (TM)
3. M.A. Political Science (TM)
4. M.A. Public Administration (TM)
5. M.A. Sociology (TM)
6 M.A. Journalism and Mass Communication (EM)
7. M.Sc. Psychology (EM)
8. M.A. English
9. M.A. Hindi
10. M.A. Telugu
11. M.A. Urdu
12. M.Sc. Mathematics (EM)
13. M.Sc. Applied Mathematics (EM)
14. M.Sc. Botany (EM)
15. M.Sc. Chemistry (EM)
16. M.Sc. Environmental Science (EM)
17. M.Sc. Physics (EM)
18. M.Sc. Zoology (EM)
19. M.Com. (EM)

(C) Post Graduate Diploma Programmes

1. P.G. Diploma in Marketing Management (EM)
2. P.G. Diploma in Business Finance (EM)
3. P.G. Diploma in Writing for Mass Media in Telugu
4. P.G. Diploma in Environmental Studies (EM)
5. P.G. Diploma in Human Rights (EM)
6. P.G. Diploma in Women's Studies (EM)
7. P.G. Diploma in Culture & Heritage Tourism (EM)

(D) Professional Programmes (Post Bachelor's Level)

1. Master's Degree in Business Administration (EM)
2. Master's Degree in Business Administration (Hospital and Health Care Management) (EM)
3. Master's Degree in Library & Information Science (EM)
4. Bachelor's Degree in Library & Information Science (EM/TM)
5. Bachelor's Degree in Education (TM)
6. Bachelor's Degree in Education (Special Education) (EM/TM)

(E) Bachelor's Degree Programmes

1. Bachelor of Arts (EM/TM/UM)
2. Bachelor of Commerce (EM/TM)
3. Bachelor of Science (EM/TM/UM)

(F) Certificate Programmes

1. Certificate Programme in Food and Nutrition (TM)
2. Certificate Programme in Literacy and Community Development (TM)
3. Certificate Programme in N.G.O. Management (TM)
4. Certificate Programme in Early Childhood Care and Education (EM)

Sd/-
Registrar

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY

Post Box No. 21, University Road, Patan- 384 265, Gujarat, India
Phone: +91-2766 237000, 220932, Fax. +91-2766 231917
E-Mail: regi@ngu.ac.in Website: ngu.ac.in

"Accredited By NAAC with 'A' Grade
(CGPA 3.02)"
2015 - 2020

The geographical jurisdiction of the North Gujarat University encompasses five districts-Mehsana, Patan, Banaskantha, Aravalli and Sabarkantha. Each one of the five district has its own distinct heritage. Geographically a part of the whole area is towards the desert of Kutchh, while on the North Eastern side are rocky regions of forest populated by the tribal.

The economy of the area is mainly agricultural. There are a few towns here and no big city. The rest of the population lives in villages. With a view to catering to the peculiar cultural and educational needs of the area, North Gujarat University was established by the Ordinance No. 5 of 1986 dated 17.5.1986 which was later passed as the North Gujarat University Act No.22 of 1986 on 11/9/86 by the Legislative Assembly of Gujarat. The University has been functioning since then and growing and expanding steadily.

Salient Features and Landmarks

- National and International collaborations in research and teaching.
- University's own research journals and Forth nightly Newsletter published regularly.
- Excellent outdoor and indoor sports facilities.
- Well designed and maintained landscaped campus.
- "Green" campus with roof top solar arrays for renewable energy and LED lights to meet the goal of being carbon neutral campus.
- Master in Hospital Management (MHM) - A centre for medical management and research on the campus.
- Latest ICT-enabled infrastructure including smart boards.
- Online centralized admission process, enrollment, exam and e-payment enable University for cashless transactions.
- Fully operational Internal Quality Assurance Cell (IQAC), University-Industry Linkage Cell, Center for International cooperation and Studies, Research and consultancy cell, Committee against sexual Harassment (CASH), Placement Cell, University employment Bureau, SSIP Cell, Environment Cell, Entrepreneur Development Cell, Career Counseling Cell, NCC and NSS cell
- On campus constituent Institutes for Bachelor Degree in Architecture and

courses offers

33	43	28
Under Graduate	Post Graduate	Ph. D.
13	14	4
Post Graduate Diploma	Certificate	Diploma

More than 01,06,309 students enrolled in various Faculties
More than 2,10,355 students are studying in various faculties
2198 students involved in higher courses like Ph.D.
329 Ph.D mentors
More than 2305 Ph. D Awarded students
more than 50 post Affiliated PG Colleges
21 Uni. Department, Centre and Constitute Institutes
More then 549 Affiliated UG Colleges
More then 1,00,000 Reference Book

221 Acres landscaped Campus

Corses offered at the H.N.G.U. Campus

Master of Arts (M.A. Sanskrit, English)
Master of Business Administration (M.B.A.)
Master of Commerce (M.Com)
Master of Hospital Management (M.H.M.)
Bachelor of Commerce (B.Com)
Master of Science - Computer Application and Information Technology (M.Sc. C.A.& I.T.)
Master of Computer Application (M.C.A.)
Bachelor of Library & Information Science (B.Lib.),
Master of Library & Information Science (M. Lib.)
Bachelor of Social Work (BSW),
Master of Social Work (MSW)
Bachelor of Physical Education (B.P.Ed.),
Master of Physical Education (M.P.Ed.)
Master of Law (LLM)
Master of Journalism & Mass Communication (MJMC)
Master of Science (Chemistry, Microbiology, Botany, Zoology, Environment Science, Biotechnology, Maths, Biotechnology, Physics, Electronics)
Five Year Integrated Master of Science (Life Sciences)
Post Graduate Diploma in Medical Laboratory Technology (P.G.D.M.L.T.)
Bachelor of Architect (B.Arch.), Master of Planning (M.Arch.)
Post Graduate Diploma in Yoga
Post Certificate Course Prakrit, Diploma in Gynecology,
Certificate Course in Gynecology
Certificate Course in Astrology

University to start 5 year Master in Science program as per National Education Policy

Infrastructural Facilities on the Campus

Boys Hostel – 600 Seats
Girls Hostel – 290 Seats
Indoor Sports Stadium
Outdoor Sports Facilities
Primary Health Center
Food Courts
Post Office
Stationary Shop
Banking and ATM Services
Child Care and Women Center
Auditoriums – Capacity varies from 100 to 800 Persons
Central Library – More than 85,000 books
Open Air Theater – 1500 Capacity
Computer Center
Wi-Fi Campus
Botanical Garden
Faculty Guest House
Research Student Hostel
Oxygen Plant facility

INDIRA GANDHI INSTITUTE OF DEVELOPMENT RESEARCH

(An Advanced Research Institute Established by the Reserve Bank of India)

DEEMED TO BE UNIVERSITY

ADMISSION NOTICE 2023

Indira Gandhi Institute of Development Research (IGIDR) invites applications for admission to the following programmes:

Master of Science (MSc) in Economics: This is a two-year programme commencing August **2023**.

Doctor of Philosophy (PhD) in Development Studies: This is a four/five-year programme commencing August **2023**.

Eligibility:

(i) The applicants to MSc and PhD programmes must have studied Mathematics at the higher secondary or higher level.

(ii) The applicants to MSc and PhD programmes must have the qualifying percentage of marks or its equivalent in the qualifying degrees as indicated below:-

Programme	Qualifying Degree	Qualifying Marks across categories of students	
		GEN (GEN-EWS/ OBC-NCL)	SC/ST/PwD
MSc Economics	BA/BSc Economics	55%	50%
	BCom/BStat/ BSc (Physics/Mathematics)/BTech/BE	60%	55%
PhD Development Studies	MA/MSc in Economics	55%	50%
	MStat/MSc (Physics/Mathematics/ Environmental Science/ Operations Research)/MBA/MTech/ME/BTech/BE	60%	55%
Note: GEN is General, GEN-EWS is General Economically Weaker Section, OBC-NCL is Other Backward Class-Non-Creamy Layer, PwD is People with Disability, SC is Schedule Caste, ST is Scheduled Tribe.			

(iii) Reservation Policy as per Government of India (GOI) rules. Applicants availing of reservations must produce the necessary documents as per GOI rules.

Scholarship/Stipend:

(i) MSc: Need-based scholarship is available as per Institute's norms.

(ii) PhD: Students will receive a monthly stipend of ₹31,000/- in the first two years. Subsequently, after fulfilling the terms and conditions for PhD registration, students will receive a monthly stipend of ₹43,750/-.

Selection Procedure: Candidates applying to the MSc and PhD programmes of the Institute will be selected based on their performance in an online test and an interview. The online tests for MSc and PhD applicants will be held separately but at the same time. A candidate, even if eligible, can apply and appear in the test for only one of the programmes.

Online Test:

(i) MSc: (a) Comprehension and English, (b) Basic Mathematics (higher secondary level), and (c) either Economics or Advanced Mathematics at the undergraduate level.

(ii) PhD: (a) Comprehension and English, and (b) Basic Mathematics (higher secondary level).

Date and Time of Online Test: 06 May 2023; 10.00 am to 1.00 pm.

Centres of Online Test: Ahmedabad/Gandhi Nagar, Aizawl, Bengaluru, Bhopal, Bhubaneswar, Chandigarh-Mohali, Chennai, Dehradun, Delhi NCR, Ernakulam/Kochi, Guwahati, Hyderabad/Secunderabad/Rangareddy, Indore, Jaipur, Jammu, Kolkata/ Greater Kolkata, Lucknow, Mumbai/Greater Mumbai/Thane/Navi Mumbai, Panaji, Patna, Pune, Raipur, Ranchi, Shillong, Thiruvananthapuram, Varanasi/Kashi and Visakhapatnam.

Interview Schedule: Interviews are tentatively scheduled during the third or fourth week of June 2023.

Online Application : Candidates can fill out the application form available at : **http://www.igidr.ac.in/academic-programmes/admission-2023/.**

Application Fee: To be paid online is ₹500/- only for the General category and ₹100/- only for all others (GEN-EWS, OBC-NCL, SC, ST and PwD).

Deadline: The last date for receipt of the online application form is **21 April 2023**.

Registrar, IGIDR

JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY

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Admission for Ph.D. Scholars
Joint National Entrance Examination (JNEE) 2023 Phase I[st]

Last Date for Submission of Application Form : 30 April, 2023
Registration Fee : INR 3,000/-Exam Mode : Online/Ofline

Date of Entrance Examination : 21 June, 2023
Result Declaration : 22 June, 2023
Joining /Reporting at Campus : Will Be Declared Later

DISCIPLINES

Group - A (Non Practical)

History I Hindi I English I Pol Science I Geography I Education I Journalism I Public Adm. I Economics I Mathematics I Computer Science I Management Law I Sociology I Commerce I Library Science

Group - B (Practical)

Chemistry I Physics I Zoology I Botony Biotechnology & Life Sciences I Microbiology I Biochemistry I Nutrition & Dietetics I Pharmacy I Food Technology I Physiotherapy

Ph.D. Courses Fee Structure

Entrance Fee : Rs. 3,000/-

Complete Program Fee 2,86,000 (Non Practical)
3,16,000 (Practical)

Admission Process

- Merit Based through JNEE Exam.
- Candidate who are NET/JRF Qualified called directly for Personal Interview.

Eligibility
Post Gradautaion with 55% (Gen.) & 50% (Reserve) Category

How to Apply
Visit www.jvwu.ac.in Submit Form with Rs. 3,000/-

Website : www.jvwu.ac.in
Toll Free No. : 1800 5722 266

Apply for Admission in **Ph.D. Programs** at **12B Status Approved** University by UGC

Candidates who have qualified in **NET-JRF** or the **UGC-CSIR Joint Examinations** are eligible for direct admission and can avail fellowship from **UGC-GOI.**

Karnataka State Dr.Gangubai Hanagal Music And Performing Arts University

J.L.B Road, Lakshmipuram, Myusru – 570004
Phone: 0821-2419443,2402141

DETAILS OF COURSE

a) **Hindustani Classical Music - B.P.A., M.P.A., Diploma & D.Litt.**
b) **Karnataka classical Music - B.P.A.,M.P.A., Diploma & D.Litt.**
c) **String Instruments - Veena,Vioalin - B.P.A.,M.P.A.,Diploma & D.Litt.**
d) **Percussion - Tabla, Mridangam- B.P.A., M.P.A., Diploma & D.Litt.**
e) **Dance - Bharatanatyam, Kathak, B.P.A., M.P.A., Diploma & D.Litt.**
f) **Theatre Arts - B.P.A., M.P.A. Diploma & D.Litt.**

Required qualification of the students for admissions are as

Diploma & Certificate Courses : Passed in SSLC or Equivalent

Bachelor of Performing Arts : Passed in PUC irrespective of any subjects, First priority given for the candidates who have passed equivalent exam with respect to performing arts.

Master of Performing Arts : Passed degree in any subjects, Passed in Equivalent exam and Performing Arts .

D.litt : Must have studied in the fields of Music, Dance and Drama and other art forums.

Must have published research articles and books .

Eligibility : As per Norms.

DIGITAL UNIVERSITY KERALA

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Digital University Kerala (DUK) is India's first digital university dedicated to the mission of enabling responsible digital transformation. At its lush green campus in Kerala, DUK offers Post Graduate and PhD programs. DUK's nationally reputed Centres of Excellence such as Maker Village, Kerala Blockchain Academy (KBA), Intelligent IoT Sensors, India Innovation Center for Graphene, Centre for Digital Innovation, and Product Design provide excellent learning opportunities for budding professionals.

Innovation Centres & CoEs

KBA

Intelligent IoT Sensors

Maker Village

CENTRE FOR DIGITAL INNOVATION AND PRODUCT DEVELOPMENT

INDIA INNOVATION CENTRE FOR GRAPHENE

Programs Offered

M.Tech

In Computer Science & Engineering with specialisations in **Artificial Intelligence, Cyber Security, Connected Systems.**

In Electronics Engineering with specialisations in **AI Robotics, Signal Processing.**

For Working Professionals in **Electronic Product Design.**

M.Sc.

In Computer Science with specialisations in **Machine Intelligence, Cyber Security, Data Analytics, Geospatial Analytics.**

In Electronics with specialisations in **IoT & Robotics, VLSI Design & Artificial Intelligence.**

In Ecology with specialisation in **Ecological Informatics.**

In Data Analytics with specialisations in **Computational Science, BioAI, Geoinformatics.**

MBA

In **Digital Technologies & all functional verticals.**

PhD

Full-time Regular PhD.
Part-time Regular PhD.
Industry Regular PhD.

Post Graduate Diploma in **e-Governance.**

Recognitions

- Digital India Platinum Award- Project DWMS.
- Kerala State e-Governance Award- Project Mannu.
- Chief Minister's Special Award For Innovation-Project Immunochain.
- IET Future Tech Award For Blockchain Progresses.
- Going Global Partnerships Exploratory Grant from British Council.
- UK PACT - Green Recovery Challenge Fund from UK Government.
- DUK Faculty listed under Stanford University's Top 2% Scientists.

+91-471-2788000 info@duk.ac.in https://duk.ac.in

Makhanlal Chaturvedi National University of Journalism and Communication

INFRONT OF M.P. STATE SHOOTING ACADEMY,
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In Pursuit of Excellence

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- First media academic centre in the Asian subcontinent.
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- Comprehensive academics with exceptional industry exposure and quality education at affordable fee structure in the best professional environment.
- New campus in 50 acres with 58 lakh sqft built-up area.
- Techno-friendly, nature friendly and well equipped with modern amenities.
- Spacious classrooms, well equipped labs, computer centres and studios, libraries, cafeteria, canteen.
- Separate Boys and Girls Hostel with modern gym, clinic for students, recreation centres, playgrounds, indoor and outdoor games, stadiums, auditoriums, essential shopping, 24-hours ATM facility, medicine and health care.
- Regular Seminars, Workshops, International and National conferences.
- Industry University interface.
- Outstanding placement opportunities.

PROGRAMS OFFERED

University Campus: - Bhopal (Main Campus), Khandwa, Rewa and Datia Campus

- **MA(J)** Master of Arts (Journalism)
- **MA(MC)** Master of Arts (Mass Communication)
- **MSc(EM)** Master of Science (Electronic Media)
- **MA(APR)** Master of Arts (Advertising & Public Relations)
- **MA(BJ)** Master of Arts (Broadcast Journalism)
- **MBA(MBM)** MBA (Media Business Management)
- **MSc(FP)** Master of Science (Film Production)
- **MA(DJ)** Master of Arts (Digital Journalism)
- **MSc(MR)** Master of Science (Media Research)
- **MSc(NM)** Master of Science (New Media)
- **MCA** Master of Computer Applications
- **M(LIS)** Master of (Library & Information Sciences)
- **BBA(EC)** Bachelor of Business Administration (E-Commerce)
- **B.TECH(PP)** B.Tech (Printing and Packaging)
- **B.TECH(PP) LE** B.Tech (Printing and Packaging) (Lateral Entry)
- **BSc(GA)** Bachelor of Science (Graphics and Animation)
- **B(LIS)** Bachelor (Library & Information Sciences)
- **PGDRJ** Post Graduate Diploma in Rural Journalism
- **PGDCA** Post Graduate Diploma in Computer Applications
- **DCA** Diploma in Computer Applications

NEP Programs

- **BA(JCW)** Bachelor of Arts (Journalism & Creative Writing) (Honors)
- **BA(APR)** Bachelor of Arts (Advertising & Public Relations) (Honors)
- **BSc(EM)** Bachelor of Science (Electronic Media) (Honors)
- **BA(MC)** Bachelor of Arts (Mass Communication) (Honors)
- **BSc(MM)** Bachelor of Science (Multimedia) (Honors)
- **BCA** Bachelor of Computer Applications (Honors)
- **B.Com (M)** B.Com (Management) (Honors)
- **BSc(FCS)** Bachelor of Science (Film and Communication Studies) (Honors)

Evening Programs

- P.G. Diploma in Yogic Health Management (PGDYHM)
- P.G. Diploma in Video Production (PGDVP)
- P.G. Diploma in Film Journalism (PGDFJ)
- P.G. Diploma in Social Media Management (PGDSMM)
- P.G. Diploma in Event Management (PGDEM)
- P.G. Diploma in Cyber Security (PGDCS)
- P.G. Diploma in Mobile Journalism (PGDMOJO)
- P.G. Diploma in Rural Journalism (PGDRJ)

Ph.D

- **Ph.D.** in Media Studies
- **Ph.D.** in Computer Sciences

Please Contact: 0755-2551642 **(Bhopal)**

Registrar

MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)
Grade 'A++' Accredited by NAAC (Category I)
Sector-1, Kamothe, Navi Mumbai - 410209
Tel. No. 022-27432471, 022-27432994, 022- 35202701
E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

Academic Program 2023-24

MGM Medical College - Navi Mumbai and Aurangabad

- **NAAC Grade A++ (CGPA 3.55).**
- **Category 1 University under graded autonomy.**
- **University Hospitals: JCI, NABH & NABL Accredited.**
- **NIRF 2022 University rank band 151-200.**
- **Atal Ranking for Innovation (ARIIA) 2021: Promising Band.**
- **Institutional Innovation Council (IIC) 2022: 3.5 star rating.**
- **SIRO recognised research facilities.**
- **More than 5000 students enrolled with more than 500 faculty base.**
- **More than 10,000 alumni serving all over world as health care force.**

UG Program: MBBS
PG Program: Anatomy, Physiology, Biochemistry, Microbiology, Pharmacology, Pathology.
MD : Community Medicine, General Medicine, Respiratory Medicine, #Emergency Medicine, Dermatology, Paediatrics, Anaesthesiology, Radiology, Psychiatry, # Immuno Haematology, #Geriatrics, # Family Medicine.
MS : General Surgery, Orthopedics, Ophthalmology, Obst. & Gynaec., ENT, #Traumatology & Surgery
M.Sc. (Medical): Medical (Anatomy, Physiology, Biochemistry, Microbiology, Pharmacology)
Superspeciality Program:
DM : Cardiology, *Nephrology.
Mch : Cardio Vascular Thoracic Surgery, Urology, *Plastic Surgery

MGM School of Physiotherapy - Navi Mumbai and Aurangabad

UG Program: BPT
PG Program:
- # Cardio Vascular & Respiratory Physiotherapy
- Musculoskeletal Physiotherapy
- *Community Physiotherapy
- Sports Physiotherapy
- Neuro Physiotherapy

Only in Navi Mumbai
*Only in Aurangabad

MGM New Bombay College of Nursing (At Navi Mumbai)

UG Program:
- BSc Nursing • Post Basic BSc Nursing

PG Program:
- MSc (Medical Surgical Nursing)
- NPCC Nursing

MGM School of Biomedical Sciences- Navi Mumbai & Aurangabad

UG Program:
- B.Sc (Operation Theatre & Anesthesia Technology)
- B.Sc (Cardiac Care Technology) • B.Sc (Perfusion Technology)
- B.Sc (Medical Dialysis Technology) • B.Sc (Medical Laboratory Technology)
- B.Sc (Medical Radiology & Imaging Technology) • B.Optometry

B.Sc (Physician Assistant in Emergency & Trauma care)

PG Program:
- M.Sc (Medical Biotechnology) • M.Sc (Medical Genetics)
- *M.Sc (Clinical Research) • # M.Sc (Clinical Embryology)
- # M.Sc (Clinical Nutrition) • # M.Sc (Molecular Biology) • # M.Sc (Biostatistics)
- M.Sc (Medical Radiology & Imaging Technology) • M.Sc (Cardiac Care Technology)
- # Masters of Public Health • # M.Optometry • # Master in Hospital Administration
- M.Sc (Medical Dialysis Technology)

MGM Institute's University Department Of Prosthetic & Orthotics, Navi Mumbai

UG Program: Bachelor in Prosthetic & Orthotics (BPO)

Ph.D. & Fellowship Programs in medical and allied specialities

For further details of admission
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Phone: 033 4066 3220

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Courses on offer under the Schools of Studies	
Post Graduate Degree Programme (PGP) (Duration: 2- year)	Bengali, English, History, Pol. Science., Public Administration, Social Work, Education, Library and Information Science, Commerce, Geography, Zoology, Mathematics, Economics, Journalism & Mass Communication
Under Graduate Degree Programme (UG) (Duration: 3-year)	Bengali, English, History, Pol. Science, Sociology, Public Administration, Economics, Commerce, Education, Physics, Chemistry, Botany, Geography, Zoology, Mathematics.
Diploma Courses (Duration:1-year)	Pre-Primary Teachers' Education-Montessori, Yoga Education, Entrepreneurship Development & Small Business Management, Digital Marketing, Web Designing etc.
Advanced Diploma Courses (Duration: 1 to 2-year)	Public Relations & Advertisement, English Language Teaching, e-Accounting & Taxation, Export-Import Management, Hospital Front Office Management, Psychological Counselling, Disaster Risk Management, Needlework and Knitting, Fire Safety Skills & Security Management, Tailoring and Dress Designing, Applied Art etc.

Academic session: July for UG and January for PG degree programmes

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N.B.: NSOU publishes biannual multidisciplinary online journal "NSOU-OPEN JOURNAL**" (http://www.wbnsou.ac.in/openjournals/index.shtml)**

Reaching the Unreached

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Civil Engineering
Computer Science & Engineering
Electrical Engineering
Electronics & Communication Engineering
Mechanical Engineering
Metallurgical & Materials Engineering
Production & Industrial Engineering

CENTRES OF EXCELLENCE

Centre of Excellence in Data Science
Centre of Excellence in Industrial and Product Design
Centre of Excellence Siemens
Centre of Management and Humanities
Cyber Security Research Centre
Kalpana Chawla Chair of Geospatial Technology

About Saurashtra University

The Saurashtra University was established on a rigorous demand, for a separate university out of Gujarat University (Ahmedabad), from the eminent educationist and freedom fighters of the Saurashtra region. The demand was more prominent after the creation of Gujarat state on May 1, 1961. The Saurashtra University Act was passed by the Legislative Assembly of Gujarat in the year 1965 (Gujarat Act No. 39 of 1965). Saurashtra University, became functional on 23rd May, 1967. The campus of the University is spread over 360 acres of land area. The present jurisdiction of the University includes Amreli, Jamnagar, Rajkot, Surendranagar and Morbi districts.

The Nehru Chair, Baba Saheb Ambedkar Chair, Sardar Vallabhbhai Patel Chair, Swami Dayanand Saraswati Chair, Gulabdas Broker Chair, etc. are the jewels in the crown of the University. The ZaverchandMeghani Lok Sahitya Kendra is established with the financial support of Govt. of Gujarat which is a place to nurture regional folk and culture of Saurashtra region. The University in collaboration with Commissionerate of Industries, Government of Gujarat, and Department of Science and Technology, Government of India, has developed National Facility for Drugs Discovery (NFDD) in the year 2009 which is now upgraded as Centre of Excellence (COE).

The Career Counseling and Development Center (CCDC) is working hard for the shaping the future of students and preparing them for various competitive examinations.

The university is also committed to protect environment. The 'Plastic Free Campus' and plantation of more than 40,000 trees adding the beauty to the campus are the initiatives in this direction.

The Saurashtra University has the pride to be the first State University of Gujarat which was accredited by NAAC with Grade 'A' with CGPA 2.05 during 3rd cycle of accreditation in the year 2014. The university has recently accredited in 4th cycle with Grade 'B' (CGPA 2.49) by NAAC.

The Saurashtra University has a prospective plan to be the front runner in the field of higher education by the implementation of National Education Policy-2020.

Facilities

- Coaching Centre for UPSC Examinations
- Central Library
- UGC-Human Resource Development Centre
- RojgarMahiti Kendra
- Career Counseling and Development Center
- Cafeteria
- Women Fitness Centre
- Health Centre
- Student Startup Innovation Cell
- Student Research Assistance Scheme
- Industry Institute Interaction Cell (IIIC)
- Placement Cell
- Student Mentoring Cell (SMC)
- International Studsent Cell
- Sardar Patel Sports Complex Sports Centre of International Standards
- Transist House for International Students
- VIDUSHI (Centre for Women's Studies & Research)
- Day Care Centre

60,000+ Students

29 Post Graduates Departments

98 Programs Offered

238 Affiliated Colleges

SAURASHTRA UNIVERSITY

(A State Conventional University Established by Government of Gujarat Act 1965)

Rajkot-360005, Gujarat (India)

https://saurashtrauniversity.edu

CENTENARY CELEBRATED SHARNBASVESHWAR VIDYA VARDHAK SANGHA'S

ಶರಣಬಸವ ವಿಶ್ವವಿದ್ಯಾಲಯ

SHARNBASVA UNIVERSITY

ಕಲಬುರಗಿ–585 103 ಕರ್ನಾಟಕ । ಭಾರತ

Estd. : 2017

Kalaburagi-585 103 Karnataka | India

KALABURAGI-585 103, KARNATAKA - INDIA

www.sharnbasvauniversity.edu.in | Email : sharnbasvauniversity@gmail.com

- One among the very few private University offering multi disciplinary courses in the country.
- University offers almost all courses in the disciplies ranging from Arts, Commerce,Music, Journalism, Fine arts, Travel and tourism, Yoga, Bharatanatyam and Langugages to professional courses.
- University offers both Under Graduate, Post Graduate and research(Ph.D) studies including B.Tech, B.Arch, B.C.A, B.B.A in logistics, Aviation services and Air cargo M.B.A, M.Tech, M.C.A, MA in Kannada, MA in English, MA in Journalism & Mass Communication, MA in music, MA in Visual Arts, M.Sc in Physics, Ph.D in Physics, M.Sc in Botny, Ph.D in Botny, M.Sc in Zoology, Ph.D in Zoology, M.B.A in Hospital Management, M.Com and M.Sc in Mathematics.
- Sharnbasva University is women centric university with women students and teaching staff out numbering their male counter parts.

SHRI
DHARMASTHALA
MANJUNATHESHWARA
UNIVERSITY

Sattur, Dharwad - 580 009, Karnataka, India

CONSTITUENT INSTITUTIONS

SDM College of Medical Sciences & Hospital
SDM College of Dental Sciences & Hospital
SDM College of Physiotherapy
SDM Institute of Nursing Sciences
SDM Research Institute for Biomedical Sciences

Shri Dharmasthala Manjunatheshwara University, Sattur, Dharwad (Karnataka State) was established as a State Private University under the Karnataka State Act 19 on 19th December, 2018. This University was sponsored by Shri Dharmasthala Manjunatheshwara Educational Society Ujire, Dakshina Kannada District, Karnataka. SDM Educational Society runs over 55 Premier Academic and Professional Institutions across the State of Karnataka since 1903. The varied Academic Streams run by the SDM Educational Society are Medicine, Dentistry, Physiotherapy, Nursing, Biomedical Sciences, Engineering, Ayurveda, Naturopathy & Yogic Sciences, Law, Management, Humanities and so on. Poojya Shri D. Veerendra Heggade is the President of SDME Society and ably administers all the Academic and Professional Institutions.

Shri Dharmasthala Manjunatheshwara University has five Constituent Institutions namely SDM College of Medical Sciences & Hospital, SDM College of Dental Sciences & Hospital, SDM College of Physiotherapy, SDM Institute of Nursing Sciences and SDM Research Institute for Biomedical Sciences. SDM Medical College is attached with 1250 Bedded Hospital with Super Specialty Services. SDM University provides quality Education and Healthcare facilities to the people of North Karnataka at an affordable cost. The Hon'ble Chancellor of the University is dreaming to make this University as a Center of Excellence in this part of Karnataka. Our Chancellor, Poojya Shri D. Veerendra Heggade is also the Member of Rajya Sabha and President of Shree Kshetra Dharmasthala Rural Development Program which is well known in the Nationwide.

Under the able leadership of Dr. Niranjan Kumar, Eminent Plastic Surgeon and the Vice Chancellor of SDM University, the University and its Constituent Institutions has secured Top Ranks in the Country among the Private Universities and Institutions..

6th Floor, Manjushree Building, SDM College of Medical Sciences & Hospital Campus, Sattur, Dharwad - 580 009, Karnataka, India
Tel.: +91 836 2477777, 2321000 & 7187000 | Email: sdmuo@sdmuniversity.edu.in / registrar@sdmuniversity.edu.in |
Web: sdmuniversity.edu.in

Sri Sathya Sai Institute of Higher Learning

(Deemed-to-be-University)

sssihl.edu.in

Sri Sathya Sai Institute of Higher Learning (SSSIHL), Prasanthi Nilayam, Andhra Pradesh, India, is a visible manifestation of its Founder Chancellor Bhagawan Sri Sathya Sai Baba's vision of *'education for human transformation'* providing quality education free for all students irrespective of income, religion, or region through merit-based open admissions policy.

SSSIHL – A Modern Gurukula

Founded in 1981 to inculcate ethical and moral values in students along with regular secular education, this transformation has been the guiding principle right from the inception of SSSIHL. The institute provides a holistic framework of interpersonal development for its students, combined with academic and research excellence. Its residential character trains the mind, body, and spirit of the student in an environment similar to the ancient Indian 'gurukula' system of education, in the most modern context.

The Institute hosts students from across the country for its undergraduate, postgraduate, professional, and research programmes across its four campuses in Anantapur (Women), Prasanthi Nilayam (Men) in Andhra Pradesh, and Muddenahalli (Men) & Brindavan, Kadugudi (Men) in Karnataka.

Admissions 2023

Roll out of Four-year undergraduate programmes* as per NEP2020:

UG Programmes (Hons./ Hons. with Research): B.Sc. in Natural Sciences/ Life Sciences/Math & Computer Science/ Food Science & Technology/ and Economics; **B.A.** in Economics/ and English, **B.B.A., B.Com., B.P.A** (Hons.) in Music and **B.Ed.** – all with specializations in specific areas.

PG Programmes: M.A. in English Language and Literature/Economics, **M.Sc.** in Physics/Chemistry/ Mathematics/ Bioscience/Food and Nutritional Sciences – all with specializations in specific areas.

Professional Programmes: M.B.A., and **M.Tech**. in Computer Science/ Optoelectronics & Communications

**Few Programmes are gender/campus specific. For more details refer to the latest prospectus. Stay tuned to sssihl.edu.in*

Why SSSIHL?

- UN recognition of Sri Sathya Sai Values-Based Integral Education Initiatives - now part of the UN Sustainable Development Goals (SDG)
- 41 years of values based quality education since 1981
- Strong research environment, combined with exceptional academic practices
- World class research facilities - Central Research Instruments Facility (CRIF) and the Central Research Laboratory (CRL) - over 60 research collaborations across academia and industry, 15 are international
- Research funding from national and international agencies like UGC, DST, DBT, BIRAC, ICMR, Tata Foundation Trust, Maestro technologies, USA; Labby Inc., USA, JAIST Japan, Kurita Water and Environment Foundation, Japan, US-FDA and more
- Successful clinical validation of the first prototype of a portable, cost-effective and high-resolution Gamma Camera system - SAI-GC - for small organ imaging, including that of non-invasive cancer
- First Indian HEI to be honoured with the CAS University Award 2022, by the Casualty Actuarial Society (CAS), USA
- MGNCRE recognized - Green Institutional Mentor (2020) and One District One Green Champion (2020-21)

The End of Education is Character – Bhagawan Sri Sathya Sai Baba

SRI VENKATESWARA VEDIC UNIVERSITY

(Sponsored by TTD & Recognised by UGC)
Alipiri - Chandragiri By-pass Road, Tirupati, Andhra Pradesh – 517502
www.svvedicuniversity.ac.in

- Sri Venkateswara Vedic University is a unique landmark in the field of Vedic education and located at the foot of the Tirumala hills, Tirupati. It is a centre of higher learning where there is a salubrious mixture of ancient and modern studies and it has been attracting students from all over India and from the neighbouring countries like Nepal.
- University gives utmost priority to Research and propagate the relevance of knowledge system and the wisdom contained in the Vedic Literature for meeting the challenges of life in the technology driven contemporary society along with preserving and fostering the Vedic heritage.
- Right from the inception in 2006, the Vedic university has been offering various programmes in traditional courses of Vedas, Vedabhashyas, Aagamas, Pourohitya, Vedangas and Shastras along with ability and skill enhancement courses such as Sanskrit, English and Computer Applications.
- The students are provided with free food and accommodation. Furnished hostel rooms are made available to the students. Healthy food consisting of breakfast with milk, lunch, evening snacks with milk and dinner are provided to the students.
- All text books and note books are provided at free of cost. Dhoti with Upper Garments and Blankets were provided twice a year. Further, daily needs like soaps, shampoo and hair oil are also provided to the students.

PROGRAMMES OFFERED

SASTRI (B.A.)

1. **KRAMANTHA** in (i) Rigveda (Sakala sakha) (ii) Krishna Yajurveda (Taittiriya sakha) (iii) Shukla Yajurveda (Kanva & Madhyandina sakhas) and (iv) Atharvaveda (Shounaka Sakha)
2. **RAHASYANTHA** in (i) Samaveda (Kouthuma & Ranayaniya sakhas)
3. **PRATISHTANTHA** in (i) Vaikhanasagama (ii) Pancharatragama and (iii) Saivagama
4. **ASHTADASHA SAMSKARANTHA** in (i) Vaikhanasa Pourohitya
5. **SHODASHA SAMSKARANTHA** in (i) Aswalayana (ii) Apastamba and (iii) Paraskara Pourohityas
6. **VEDABHASHYA** in (i) Rigveda (Sakala sakha) (ii) Krishna Yajurveda (Taittiriya sakha) (iii) Shukla Yajurveda (Kanva & Madhyandina sakhas) (iv) Samaveda (Kouthuma & Ranayaniya sakhas) and (v) Atharva veda (Shounaka sakha)
7. **KALPA** (Shrauta) and
8. **MIMAMSA**

ACHAYRA (M.A.)

1. **GHANANTA** in (i) Rigveda (Sakala sakha) (ii) Krishna Yajurveda (Taittiriya sakha) and (iii) Shukla Yajurveda (Kanva & Madhyandina sakhas)
2. **LAKSHANANTA** in (i) Samaveda (Kouthuma & Ranayaniya sakhas) and (ii) Atharvaveda (Shounaka sakha)
3. **AGAMA** in (i) Vaikhanasa, (ii) Pancharatra and (iii) Saiva Agamas
4. **POUROHITYA** in (i) Vaikhanasa (ii) Aswalayana (iii) Apastamba and (iv) Paraskara Pourohityas
5. **VEDABHASHYA** in (i) Rigveda (Sakala sakha) (ii) Krishna Yajurveda (Taittiriya sakha) (iii) Shukla Yajurveda (Kanva & Madhyandina sakhas) (iv) Samaveda (Kouthuma & Ranayaniya sakhas) and (v) Atharva veda (Shounakasakha) and
6. **MIMAMSA**

VIDYAVARIDHI (Ph.D.)

(1) Veda, Vedabhashya, (2) Agama, (3) Pourohitya and (4) Mimamsa

DIPLOMA PROGRAMMES

(1) Rigveda, (2) Shukla Yajurveda, (3) Samaveda, (4) Atharvaveda and (5) Temple Management

PG DIPLOMA

(1) Lakshana Shastra of Krishna Yajurveda, (2) Pourohitya and (3) Vedanga

The University of Burdwan
Bardhaman, Dist. Purba Bardhaman, West Bengal

NIRF Rank: 87 **NAAC Grade: A** **India Today Rank: 16**

Administrative Head Quarters
Rajbati, Burdwan 713104, West Bengal, India
Website: http/www.buruniv.ac.in

New Administrative Building
Golden Jubilee Building, Burdwan 713 104, West Bengal, India
Golapbag Academic Campus
Golapbag, Burdwan 713 104, West Bengal, India

Kolkata Office of the University
Block EE-7/1, Sector-II
Bidhannagar, Kolkata

Chancellor
Hon'ble C V Ananda Bose
Rajbhaban, Kolkata – 700062

Vice Chancellor
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Dean, Faculty Council of Arts, Commerce, Law, Fine Arts, *etc*.
Prof. Pradip Chattopadhyay, M.A., Ph.D.
(Professor of History)
Mob. No. : 9593503404/9064159563
E-mail: dean_arts@buruniv.ac.in

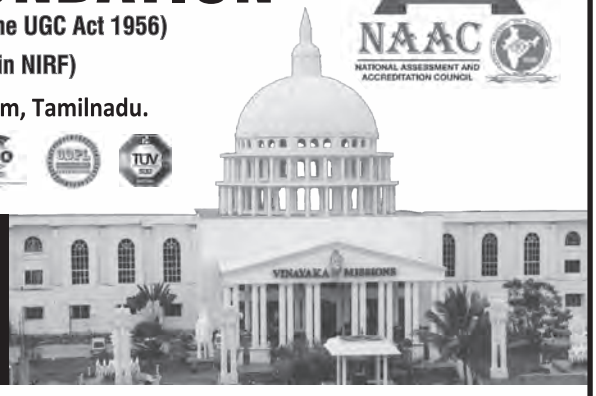
- A State University instituted by the West Bengal Act XXIX, 1959 beginning its journey on June 15, 1960.
- The Second Largest State University in West Bengal.
- Well-known for its academic rigour and progressive thought.
- A sprawling campus of 385 acres with 39 PG Departments (some identified as Centrefor Advanced Studies by the UGC) and 74 Affiliated Colleges.
- University academic and administrative campuses include a good number of heritage buildings and sites of the Bardhaman Maharaja.
- 208 well-experienced faculties at the PG level.
- Offering Certificate, Diploma, Honours, Post Graduate, M. Phil & Doctoral Programmes.
- Total approx student strength: UG: 2, 22,000 and PG: 4,000.
- By virtue of sanction of 56 teaching posts and 17 non-teaching posts by the Department of Higher Education, Govt. of West Bengal in December, 2020, the University has started **eight** new PG departments i.e. Psychology, Physiology, Electronics & Communication, Molecular Biology & Human Genetics, Public Health & Nutrition, Geo Spatial Science, Women Studies and Physical Education.
- Running 80 projects sponsored by 13 agencies like DST, UGC, ICSSR etc.
- Latest ICT infrastructure, Digital Learning Monitoring Cell, MHRD develop Virtual Lab Portal.
- 24x7 Library with 3 lakh books and 30 thousand journals.
- A standard and dedicated UGC-Human Resource Development Center for conducting FIP and Refresher Courses.
- Consultation offered to 109 client organizations.
- Owns Crop Research and Seed Multiplication Farm, Rural Technology Centre, Planetarium and Museum.
- Owns a large number of water bodies including Krishna Sayar ECO Garden, Lohor, etc.
- Students' Placement and Counselling Cell.
- Known for its continuous dialogue with the stakeholders.
- Civil Services Training Centre for Purba Bardhhaman District has been initiated in collaboration with Satyendra Nath Tagore Civil Services Study Centre, Kolkata, and District Administration.

VINAYAKA MISSION'S RESEARCH FOUNDATION

(Deemed to be University under section 3 of the UGC Act 1956)

Accredited by NAAC with 'A' Grade & Ranked in NIRF)

Sankari Main Road (NH-47), Ariyanoor, Salem, Tamilnadu.



PROGRAMMES OFFERED

For further details visit : www.vmrfdu.edu.in

MEDICAL*

- MBBS
- MD / MS

DENTAL*

- BDS
- MDS (Specialities)
  - Oral Medicine & Radiology
  - Oral & Maxillofacial Surgery
  - Periodontics • Conservative Dentistry
  - Orthodontics • Paedodontics
  - Prosthodontics
  - Oral Pathology & Microbiology
  - Public Health Dentistry

HOMOEOPATHY*

- BHMS
- MD (Specialities)
  - Practice of Medicine
  - Paediatrics • Psychiatry
  - Pharmacy
  - Organon of Medicine
  - Materia Medica • Repertory

PHARMACY

- D.Pharm
- B.Pharm
- Pharm D (Doctor in Pharmacy)
- Pharm D (Post Baccalaureate)
- M.Pharm (Specialities)
  - Pharmaceutical Analysis
  - Pharmaceutics
  - Pharmacology

NURSING

- B.Sc. (Nursing)
- Post Basic B.Sc. (Nursing)
- M.Sc. (Specialities)
  - Medical Surgical Nursing
  - Child Health (Paediatric) Nursing
  - Obstetrics & Gynaecology Nursing
  - Community Health Nursing
  - Psychiatric Nursing

PHYSIOTHERAPY

- BPT
- MPT

ALLIED HEALTH SCIENCES

- B.Sc. / B.Optom / BASLP /
- M.Sc. / M.Optom / MPH / Diploma

LAW*

- B.A. LL.B. (Hons.)
- B.B.A. LL.B. (Hons.)
- B.Com. LL.B. (Hons.)

5 years

- LL.B. (Hons.) | 3 years

ARTS & SCIENCE

- BA / B.Sc. / B.Com / BBA / BCA
- MA / M.Sc. / M.Com.

PHYSICAL EDUCATION

- B.P.Ed / BPES

ENGINEERING & MANAGEMENT

- BE / B.Tech (Specialities)
  - Biomedical Engineering
  - Biotechnology
  - Computer Science and Engineering
  - Civil Engineering
  - Electronics and Communication Engg.
  - Electrical and Electronics Engineering
  - Mechanical Engineering
  - Pharmaceutical Engineering
  - Artificial Intelligence and Data Science
  - Computer Science and Engineering (Cyber Security)
  - Information Technology
  - Computer Science and Engg. (Artificial Intelligence and Machine Learning)
- ME / M.Tech (Specialities)
  - Computer Science and Engineering
  - Manufacturing Engineering
  - Power Systems Engineering
  - VLSI Design
  - Embedded Systems Technologies
  - Construction Engineering and Management
  - Biotechnology
  - Biomedical Engineering
  - Industrial Safety and Engineering
  - Structural Engineering
  - Pharmaceutical Biotechnology

MBA (Master of Business Administration)

Salem : 0427-2529700, 9380333597 7339413388, 9944159484	Chennai & Puducherry : 1800 309 4350	Karaikal : 6380072809 9345790099, 9442690099	director.admissions@vmu.edu.in

*For UG / PG - Medical / Dental admission, the NEET 2023 eligible candidates may apply through online counselling at **www.mcc.nic.in**

*For UG / PG Homoeopathy admission, the NEET / AIAPGET 2023 eligible candidates may apply through online counselling at **www.aaccc.gov.in**

*For Law Programmes admission, the eligible candidates may apply through online / offline for VMRF LAW Aptitude Test (VLAT) at **www.avil.edu.in**

Sl. No.	Names of the Advertisers	Page No.
1	Somaiya Vidyavihar University, Mumbai	**Cover Inside (Second)**
2	Adesh University, Bathinda	178
3	Assam Rajiv Gandhi University of Co-operative Management, Sivasagar	178
4	Fore School of Management, New Delhi	179
5	Jharkhand University of Technology, Ranchi	179
6	Mangalore University, Mangalagangothri	180
7	Maulana Azad National Urdu University, Hyderabad	180
8	Rajiv Gandhi National University of Law, Punjab, Patiala	181
9	Shahu Shikshan Sanstha (Pandharpur), Shahad, Dist. Thane	181
10	Sri Devaraj Urs Academy of Higher Education and Research, Kolar	182
11	Tantia University, Sri Ganganagar	182
12	Abhilashi University, Mandi	183
13	Atal Bihari Vajpayee University, Bilaspur	184
14	Atmiya University, Rajkot	185
15	Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore	186
16	Bharati Vidyapeeth (Deemed to be University), Pune	187
17	B L D E (Deemed to be University), Vijayapura	188
18	Central University of Himachal Pradesh, Dharamshala	189
19	Chandigarh University, Mohali	190
20	Charotar University of Science & Technology, Changa	191
21	C M R University, Bangalore	192
22	Damodaran Sanjivayya National Law University, Visakhapatnam	193
23	Dr B R Ambedkar Open University, Hyderabad	194
24	Dr D Y Patil Vidyapeeth (Deemed to be University), Pune	195

(Cont'd on pg. 249)

(Cont'd from pg. 248)

Sl. No.	Names of the Advertisers	Page No.
25	GLA University, Mathura	196
26	Guru Ghasidas Vishwavidyalaya, Bilaspur	197
27	Hemchandracharya North Gujarat University, Patan	198
28	HSNC University, Mumbai	199 - 200
29	Indian Maritime University, Chennai	201
30	Indira Gandhi Institute of Development Research, Mumbai	202
31	IIHMR University, Jaipur	203
32	IIS University, Jaipur	204
33	Jain Vishva Bharati Institute, Ladnun	205
34	Jamia Millia Islamia, New Delhi	206
35	Jayoti Vidyapeeth Women's University, Jaipur	207-209
36	Jaypee University of Information Technology, Solan	210
37	JSS Academy of Higher Education & Research, Mysuru	211
38	JSS Science and Technology University, Mysuru	212
39	Kalinga University, Naya Raipur	213
40	Karnataka State Dr. Gangubai Hangal Music and Performing Arts University, Mysuru	214
41	Kerala University of Digital Sciences, Innovation and Technology, Thiruvananthapuram	215
42	K L (Deemed to be University), Vijayawada	216
43	KLE Academy of Higher Education and Research, Belagavi	217
44	LNCT University, Bhopal	218
45	Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala	219
46	Makhanlal Chaturvedi National University of Journalism and Communication, Bhopal	220
47	Manav Rachna University, Faridabad	221
48	Manipal Academy of Higher Education, Manipal	222
49	Manipal University, Jaipur	223

(Cont'd on pg.250)

(Cont'd from pg. 249)

Sl. No.	Names of the Advertisers	Page No.
50	Marwadi University, Rajkot	224
51	MGM Institute of Health Sciences, Navi Mumbai	225
52	MIT Art, Design & Technology University, Pune	226
53	Mody University of Science & Technology, Sikar	227
54	Netaji Subhash Open University, Kolkata	228
55	Punjab Engineering College (Deemed to be University), Chandigarh	229
56	Sanskriti University, Mathura	230
57	Sant Longowal Institute of Engineering and Technology, Sangrur	231
58	Saurashtra University, Rajkot	232
59	Sharnbasva University, Kalaburagi	233
60	Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, Srinagar Kashmir	234
61	Shri Dharmasthala Manjunatheswara University, Dharwad	235
62	Sister Nivedita University, Kolkata	236
63	Sri Ramachandra Institute of Higher Education, Chennai	237
64	Sri Sathya Sai Institute of Higher Learning (Deemed to be University), Prasanthi Nilayam	238
65	Sri Vaishnav Vidyapeeth Vishwavidyalaya, Indore	239
66	Sri Venkateswara Vedic University, Tirupati	240
67	S R M Institute of Science and Technology, Chennai	241
68	S R M University, Andhra Pradesh, Guntur	242
69	SVKM's NMIMS (Deemed to be University), Mumbai	243
70	The University of Burdwan, Bardhaman	244
71	University of Engineering & Management, Jaipur	245
72	Veer Narmad South Gujarat University, Surat	246
73	Vinayaka Mission's Research Foundation (Deemed to be University), Salem	247
74	Om Sterling Global University, Hisar	**Cover Inside (Third)**
75	Dr. Babasaheb Ambedkar Open University, Ahmedabad	**Cover Back**

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Published on Monday: 20-03-2023 No. of Pages 252 including Covers Posted at LPC Delhi RMS, Delhi-6 on Tuesday/Wednesday every week

Azadi Ka Amrit Mahotsav | BAOU Education for All | Dr. Babasaheb Ambedkar Open University (Established by Government of Gujarat) | NAAC ACCREDITED A++ GRADE 3.55/4 | G20 भारत 2023 INDIA

BAOU strives to fulfill its motto of 'Education for All'

Dr. Babasaheb Ambedkar Open University (BAOU) established in 1994, is the only State Open University of Gujarat. It is a mighty contributor in the State's higher education with cumulative enrolment of 8,00,000 + students. The University impacts the lives of citizens of Gujarat with easy access to higher education without any barriers of age, time and space; for it offers more than 80 programmes of Regular and Vocational-Professional courses comprising of Ph.D, Post-Graduate, Graduate, PG Diploma, Diploma and Certificate; with 06 Regional Centres and 250+ Study Centres across Gujarat.

In the leadership of Hon'ble Vice Chancellor, Prof. Dr. Ami Upadhyay, Dr. Babasaheb Ambedkar Open University has achieved milestones in different academic, societal and administrative fields through implementation of National Education Policy-2020, initiatives for community development, inclusive education, women-empowerment and more.

Promotion and Implementation of National Education Policy-2020

NEP-2020 released under the Prime Ministership of Shri Narendra Modiji is a manifesto for creating Naya Bharat. The eponymic University, BAOU has promoted and implemented Policy with certain innovative, positive and progressive endeavours. Initiatives as per NEP-2020 such as Academic Bank of Credit, Choice Based Credit System, Flexible Entry-Exit into programmes, throughout the year admission, On-Demand Exam, introduction of more than a dozen programmes .

Free-of-Cost Education

BAOU has undertaken noble social initiatives such as refunding the fees of students who lost their lives to Covid and providing financial support of Rs. 11,000 to the family of deceased students, also providing free-of-cost education to Covid-orpaned persons as well as women who lost their breadwinner father / husband / son to Covid-19. BAOU provides free-of-cost education to war-widows and children of Army martyrs.

E-Convocations: BAOU continued its tradition of annual convocations, organized E-convocations for two consecutive years -"5th Annual E-Convocation 2020" & "6th Annual E-Convocation 2021" awarding degrees to 25,000+ students.

BAOU: Initiatives in last two years

- **BAOU hosted AIU 95th National Vice Chancellors' Meet** – Hon'ble Prime Minister, Shri Narendra Modiji inaugurated and addressed the Meet on the theme of "Implementing National Educational Policy-2020 to Transform Higher Education in India"
- Introduction of Tej-Trusha Talent Hunt, a pioneering initiative taken by BAOU across all Indian Open Universities; successfully organized three seasons
- **Gurukul** - Model Learner Support Centre at BAOU
- **Atri** - Special Learner Centre
- **Gargi** - Centre for Holistic Development of Women at BAOU
- **Dronacharya** – Centre for Startup, Innovation and Entrepreneurship at BAOU
- SC-ST Research Centre at BAOU
- Suresh Joshi Gyanpith (Chair) at BAOU for literary activities
- All India Roundtable Conference of Women Vice-Chancellors on the theme of "Challenges and Solutions in Higher Education"
- Assembly of Women Sarpanches on the theme of "Shikshan, Samaaj, Saamarthya: Samanvaya".




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