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Centre for Research in Schemes and Policies

Readings for Higher Education Quality Assurance and Excellence

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July 2024

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Centre for Research in Schemes and Policies

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ISBN Number : 978-81-976868-0-1

Published by:
Centre for Research in Schemes and Policies,
Ground floor, TSIIC Zonal Office Building,
Financial District, Nanakramguda,
Hyderabad – 500032
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Website: https://crispindia.net/

Cover design: Muneer Muhammed
Printed at: Swamy Printers, Lakdikapul, Hyderabad

Acknowledgments

The synthesis of the ideas presented in this publication owes its realization to the invaluable contributions of esteemed educationists and academicians who graciously shared their expertise and insights. We express our sincere appreciation to all the contributors: Dr. Achyuta Devi, Principal, and Dr P. Jhansi Lakshmi, Asst. Professor, Department of Chemistry from R.B.V.R.R. Women's College; Dr. Aloysius Sequeira, Former Dean (Faculty Welfare), NIT Suratkal; Prof. Bala Bhaskar, Principal and Dr. Neerja Javvaji, Asst. Professor, Dept. of Telugu from Govt. City College, Nayapul; Dr. G. Suhasini, Asst. Professor, Head, Dept. of Zoology, from Pingle Govt. College for Women, Hanamakonda, and Prof. Vanaja. M, the Dean, School of Education and Training, Maulana Azad National Urdu University, Hyderabad. Special recognition goes to Dr Ramakrishna Reddy, Asst. Professor, Department of Public Administration at Pingle Government College for Women, Hanamakonda. He has consistently inspired his students and significantly contributed to fostering critical thinking and a research-oriented mindset among them. Under his guidance, his students, Ms. Ch. Pranitha and her team, successfully conducted impactful community-oriented research, which has been incorporated into this publication. Furthermore, we acknowledge the steadfast encouragement from the management and administration of all the institutions mentioned. They have been instrumental in nurturing both students and faculty, directing them to become exemplary models of academic excellence. We extend our heartfelt thanks to R. Subrahmanyam, CEO of the Centre for Research in Schemes and Policies (CRISP), for his unwavering support and encouragement. His guidance has been a steady beacon during challenging times. Finally, we wish to acknowledge the invaluable assistance provided by our colleagues at CRISP; Sandesh, Rohit, and Muneer, who contributed to the review, proofreading, and design aspects of this publication respectively.

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Foreword

R. Subrahmanyam IAS (rtd)
CEO, Centre for Research in Schemes and Policies

The 'Readings for Higher Education Quality Assurance and Excellence' has been developed and consolidated with the sole aim to enhance learning outcomes. The main purpose is to equip the faculty and the higher education institutions with the strategies to foster student success and elevate academic performance. The focus of this attempt is the ultimate stakeholders – the students - so that they can come out of the higher education system with expected levels of learning and employability.

Within this book, you will find a collection of grounded and well researched and proven ideas to empower educators for optimising teaching methodologies, fostering student engagement, and promoting a culture of continuous improvement within the academic community. The primary goal is to support an institution's effort in guiding students towards achieving their full potential.

Higher education serves as a cornerstone of societal progress, fostering innovation, economic development, and cultural enrichment. Thus, the academic ecosystem should ensure that the educators offer knowledge and mentorship, institutions provide resources and infrastructure for learning, researchers contribute to the academic literature, and both the curriculum and faculty are abreast to the latest advancements. Moreover, an institutional strategic plan needs to be developed for efficient decision making, to delineate and achieve institutional goals for sustained academic excellence. This collective effort shall ensure that students receive relevant up-to-date education, preparing them to meet the demands of a rapidly evolving workforce and contribute effectively to society's progress and prosperity.

The readings outlined in this document cover all these aspects and will be an asset in enhancing your teaching and administrative initiatives, contributing to quality and excellence in teaching-learning. I appreciate the efforts of the contributing authors and hope that this would be a useful resource for all the dedicated stakeholders in advancing higher education.

We appreciate your steadfast commitment to continuous professional development and wish you all the best in your journey towards academic excellence.

(R. Subrahmanyam)

PREFACE

Any educational developments and prioritisation must be situated within the global frameworks of the Sustainable Development Goals (SDGs) and the national reform agenda. The principal challenge for India, which has made significant progress in maximising access to education almost at all levels, is to improve quality. In response to this challenge after a gap of almost 30 years, reforming education at all levels was considered of utmost priority. Thus, taking a multifaceted approach, the National Educational Policy 2020 took shape and is being implemented.

Supporting the Higher Education Institutes (HEIs), in their endeavours for quality assurance and enhancement, Centre for Research in Schemes and Policies (CRISP), has been working with ten states across India. For enabling the institutions to work in a sustainable way motivating the students and faculty, CRISP through various forums has been engaging faculty, students, administrators and managements of HEIs to deliberate on their good practices and several of their challenges. Through such a networked community, institutions not only could successfully overcome the challenges but many a times the new ideas also resulted into innovative and impactful practices. To support scaling up of such initiatives and motivate more institutions to adopt newer approaches and practices in enhancing student learning, CRISP thought of collecting and collating the shared “experiences” and publishing them along with some expert academic notes. Along with the guidance handbook containing rubrics for Quality Assurance (developed by CRISP), this publication is expected to support institutions in creating vibrant campuses and also by balancing quantity and quality, facilitate successful transition of students from education to employment.

Quality education is unlikely to be achieved through focusing on any single strand or dimension of education practices. The article “Inclusive and Qualitative Expansion of Higher Education: Reform Agenda for Telangana“ puts forward the context of Telangana Higher Education and the reforms required to enhance the quality of Higher Education in the State. The suggested reforms are the reflections and outcome of the survey responses from faculty, students, community members (online and face to face interviews), visits to institutions and deliberations in various workshops organized by CRISP. Taking ahead from here, attempts are made to showcase on how most of the issues pertaining to research, student learning and collaborations can be comfortably resolved through the institutional level initiatives without waiting for Government interventions. Some of the initiatives included were aimed at tapping the potential of the students and local knowledge base, foster a climate of experimentation and support innovation and their transfer to practice and dissemination. The experiences proved that institutional level initiatives proactively engaging students and teachers and connecting to local communities will not only bring recognition and

rewards to the teachers but also have a long-lasting impact on student learning and attract funding from various sources. Experiences and initiatives of the teachers and Students of Pingle Government College for Women, Hanamkonda, which is located in remote rural/ tribal district of Telangana reflect on the ways and means of building research capacities and interest among teachers and students and conducting research with little or no funding. Similarly, with little hope of receiving external funding for Research , RBVRR Women's College, Hyderabad, synergized their community and outreach activities around common priorities and reaped impactful results. Further, with reference to advance research, the experiences of the college reflects on how networking and collaborations facilitated the institution to build research capacities. Also, the college showcased on purposeful engagement of students and faculty with the community resulting in innovations and encourage entrepreneurship among students. The article by Surbhi Kak "Advancing Higher Education through Research in Telangana" and " Fostering a Culture of Innovation in Higher Education Institutions" while detailing on the nuances of Research and Innovation connected it with the exemplars of good practices from the above-mentioned institutions, so that the faculty from any HEI can start manifesting and working in this direction using internal resources to begin with.

From several of the deliberations with the institutions, it was observed that faculty of the colleges most often are either not aware off or have an understanding on the implementation strategies of various concepts such as Outcomes Based Education (OBE), Edtech solutions, new and tech enabled pedagogies and the Institutional Development Plans (IDPs). Overall, it is observed that, with very few exceptions institutions (General Education colleges) have not made much progress on these issues. Taking the experiences from Government City College , Hyderabad , Prof.P.Bala Bhaskar, Dr.J.Neeraja and Dr. K. Rama in the article "Resurgence of Indian Undergraduate Education: Outcome Based Approach" provide the basics on OBE and how the approach supports creating vibrant campuse's contributing to holistic development of students and their smooth transition to employment. The article "EdTech for Higher Education Institutions in India" by Akhil Ravella puts forward the various possibilities and benefits of Edtech solutions in enhancing teaching and learning. Continuing on the effective classroom transaction Dr. Vanaja has penned the article "Aligning Higher Education Pedagogies for Education of Future and Present". Detailing on the transition from education 1.0 to 5.0 and the shift in learning styles and the evolving pedagogies the author urges the institutions to foster an engaging environment. The concluding article by Dr. Aloysius Sequeira on "Drafting an Institutional Development Framework: Strategic Plan for the 2024-2034 Period in alignment with the National Education Policy of 2020" and by Surbhi Kak on "How to prepare an Institutional Development Plan (IDP): An introduction" not only informs the importance of the strategic planning for sustaining the institutional practices but also in optimally

utilising and deploying the scarce resources available to the institutions. The articles emphasises the need to take a holistic development approach for achieving the institutions vision and mission.

Overall the contributions of the authors focuses on four prioritized areas which strongly impact student learning – Improved approaches to Teaching and Learning, Institutional Social Responsibility (ISR), fostering a climate of Research, Innovation and experimentation and Institutional Development Plan (IDP). These as detailed by the contributors are critical areas for revitalizing the HEIs and creating vibrant campuses grooming students with right values and skills for contributing to the national goals and social and economic development. The publication brought out in conjunction with the Guidance Handbook containing the rubrics for quality assurance is with the conviction that transformational change towards enhanced quality education will depend upon a holistic, coherent and interrelated approach.

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Inclusive and Qualitative Expansion of Higher Education: Reform Agenda for Telangana

CRISP, Telangana Team[1]

Introduction

The 2030 agenda for Sustainable Development, while identifying Education as a stand-alone goal (SDG 4), highlighted the importance of education in accelerating progress towards achievement of a range of SDGs especially – Health; Growth and Employment; Gender Equality; Climate Change and Sustainability; etc. India, at the potential stage of demographic dividend, investments in human capital is essential especially to ensure that every adolescent and youth can anticipate excellent health and high-quality education, freedom of opportunity and decent employment. Reforms in Education are therefore of utmost importance, as they not only accelerate development, but also brings a transformative and sustainable change impacting younger generations.

Telangana, born on 2nd, June 2014, is the 29th State in Union of India, the 11th largest and 12th most populated state in India. With 6th highest Gross State Domestic Product (GSDP) and Per Capita in the country, Telangana is the 7th largest state contributing to Indian Economy and ranks 22nd among Indian states in Human Development Index (HDI). Telangana, pharma capital of the country, is also a top IT exporting state with 68 Special Economic Zones (SEZs). It has a large number of Defence and Scientific establishments. 65% GSDP for Telangana accounts from Services sector. Recognising the changing roles of the colleges and universities in the new millennium, and the emerging scientific research and technological development, and most importantly student learning and developmental needs, the state government attempted to bring a transformation in the Higher Education ecosystem through several initiatives. Serious attempts were made to provide inclusive and equitable quality education, and lifelong learning opportunities for all. Though several of these initiatives have shown some positive impact, the state is still lagging in many aspects.

Thus with a clear indication, that the state needs educated and skilled youth to drive the economy, it's right time to bring a fundamental change at policy and the individual institutional level for enhancing the efficiency and accountability of the Higher Education (HE) System. Such a reform agenda can bring the necessary transformation and excellence in the field of education and research contributing to the human capacity development.

[1] CRISP Telangana Team: is currently working on Heading for Excellence Globally in Higher Education in Telangana State (HEIGHTS) project with the Department of Higher Education, Government of Telangana. The members of the state team are as follows (i) Dr. K. Rama, State Lead, Former adviser NAAC; (ii) Ms. Surbhi Kak, Fellow, Telangana; (iii) Mr. Akhil Ravella, Fellow, Telangana.

Higher Education Profile of Telangana

As per the AISHE (All India Survey on Higher Education) report 2021-22, Telangana is home to 31 Universities, which include three Central Universities, one government-funded Deemed University, four Institutes of National importance, one Open University, one governed by the State Legislature, fifteen State Public Universities, four State Private and two Deemed Private Universities. Telangana stands 9th in the total number of colleges (2083) and 2nd in terms of college density (52 colleges per lakh population). Two districts i.e. Hyderabad with 491 colleges and Ranga Reddy with 349 colleges stand at 3rd and 9th positions respectively in terms of the district level concentration of colleges. With an average enrolment of 611 per college, and a total of 11,86,775 students at UG, PG and Ph.D., the Gross Enrolment Ratio (GER) of the state is 40, which is higher than the national average (28.2).

Highlights of the Telangana Higher Education (AISHE 2021-22)

- 31 Universities and 2083 Colleges.
- GER (40) one of the highest in India.
- 1548 private colleges with 8,92,333 students enrolled.
- 109 aided colleges with 85,610 students.
- 283 government colleges with 2,08,133 students.
- 1303 Conventional Degree Colleges offering Liberal Arts, Science, Humanities and Social Sciences programs.
- 190 colleges offering programs in Engineering and Technology including Architecture, 66 colleges offering programs in Management and 84 colleges offering Pharmacy.
- Highest College Density (52 colleges per lakh population) in the country.
- 79.54% are privately managed colleges absorbing 82.45% of students.
- 13.58% are government colleges with an enrolment of 17.54%.
- Out of the total students enrolled in Higher Education Institutions (HEIs) of the state, 74.32% are pursuing UG, 13.72% in PG and 1.42% in Ph.D.
- 2,75,000 students pursuing higher education in the distance mode.
- The enrolment of all the 31 Universities stands at around 2,49,489.
- Except for around 50 students who are pursuing the Ph.D. programs in colleges, 6,942 Ph.D. students are enrolled in the University system.

The Department of Education, Government of Telangana is making all efforts to improve access, equity, relevance and quality of higher education. Some of the major initiatives in this direction include free education to girls up to PG level, low fee structure (cost of education) in comparison to neighboring states, expanding the reach of the colleges and universities for ensuring access for all, equity in higher education by establishing HEIs in tribal areas and special education centers for women in residential degree colleges, centralized admissions to regulate enrolments through Degree Online Services Telangana (DOST) portal, encouraging innovation and startups through *Telangana State Innovation Cell (TSIC)* and T-Hub (Technology Hub), etc. Further, to achieve its vision of access to quality higher education for all, the Government of Telangana aims at improving the quality of higher education by focusing its activities on the following three aspects:

1. **Improving the GER:** Though the GER (40) of Telangana is approximately 10 percent higher than that of the national average, attempts to improve access to education for every student in the state is the topmost priority of the Government.
2. **Improving overall quality of teaching and learning:** Integrating technology and skills development, curriculum revision and updation, faculty development and global good practices in teaching and learning to improve the quality of higher education ecosystem.
3. **Ensuring basic infrastructure in both government and private HEIs**: A lot of focus is on maintaining the infrastructure, which includes buildings, laboratories, libraries, equipment, furniture, and other basic amenities.

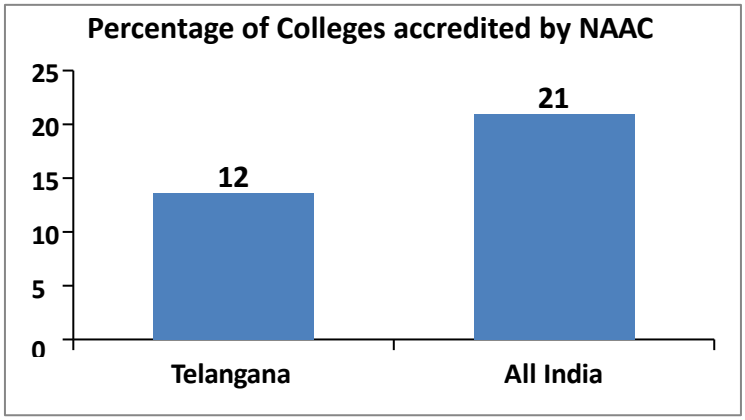


Figure 1: Percentage of NAAC accredited colleges in Telangana & India

From the data available, it is observed that many of the Telangana state universities and colleges are not yet prepared for assessment and accreditation by the National Assessment and Accreditation Council (NAAC) as they either do not have data on some of the activities they take up or they are not proactively engaged in some of the important functions such as Research and Publications,

Student Placements, Faculty Development Programs, etc. This is the case not only in government colleges but also the case with a majority of private colleges. Only 06 universities and 251 colleges have valid accreditation as on date. Out of which, 124 are general colleges (90 Government Degree Colleges and 34 Private and Private-Aided) and 128 are professional private colleges offering programs in Engineering and Technology/ Management/ Pharmacy/ Medical/ Education and others. Only 12% of the colleges are accredited by NAAC in Telangana against the national average of 21%. It is high time we targeted our accreditation to at least 25%, so that our colleges can be eligible to compete for funding for various schemes of the Government of India and research funding, and benefit students in their progression to higher education and employment. Though Government of Telangana (GoT) aspires to improve the quality of higher education provisions in HEIs of the state and is encouraging the HEIs to achieve the bench mark standards of NAAC, HEIs are extremely slow to respond or at times unresponsive.

Ranking Category of HEI	No. Participated	Rank Band			Remarks
		1-100	101-150	151-200	
University	12	1	2	1	Excludes all Centrally funded HEIs
Colleges	120	1	0	1	
Engineering	98	2	4	5	
Pharmacy	33	4	3	-	Rank band only up to 101-125
Management	44	2	1	-	
Law	06	1	-	-	Rank band up to 1-30 only
Overall	132	1	0	1	Excludes all Centrally funded HEIs

Figure 2: Status of Participation and Ranking of HEIs of Telangana in NIRF 2023

It is very evident that only 4 universities (between 1-200) and 2 colleges (between 1-200) figure in the National Institutional Ranking Framework (NIRF) Rankings 2023 (Figure 2) from Telangana.

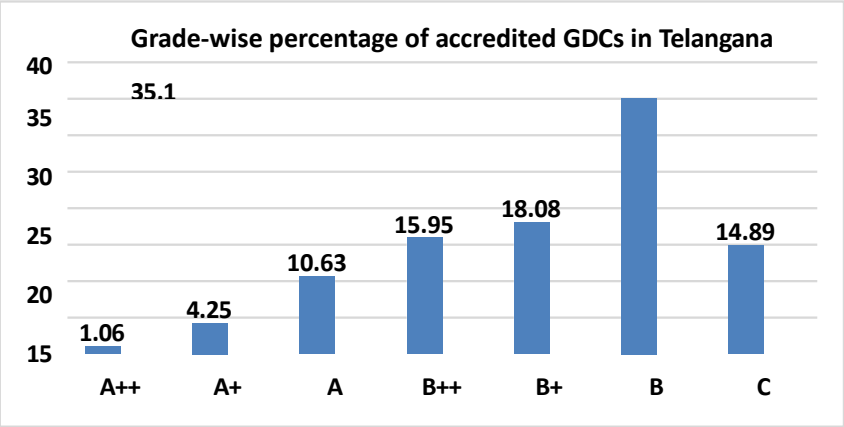
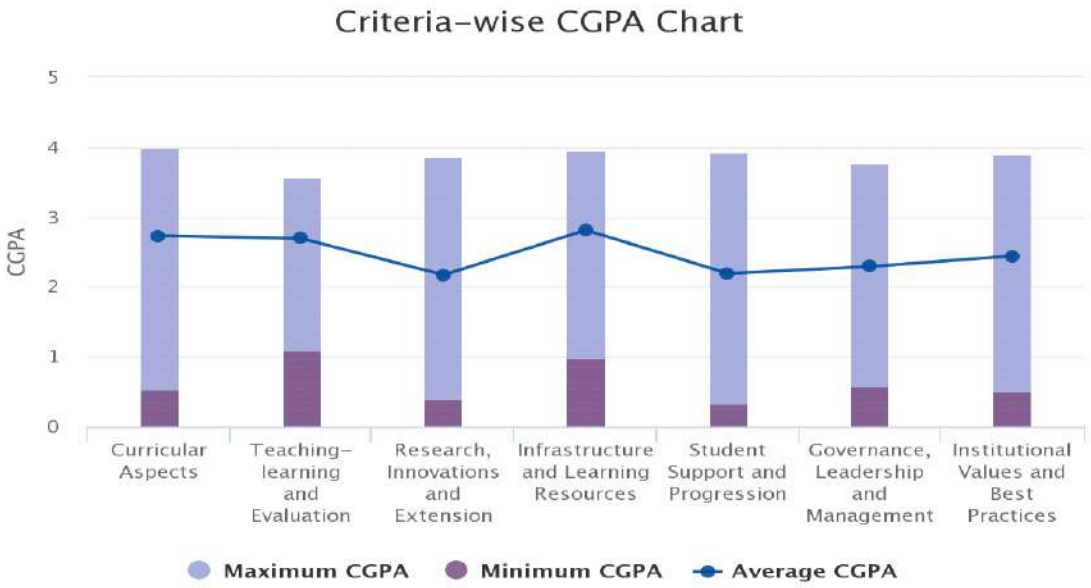


Figure 3: Grade-wise percentage of accredited GDCs (Govt. Degree Colleges) in Telangana

As visible from the performance analysis of the accredited HEIs, there are enormous challenges for the sector stretching from Curriculum Revision and Enrichment, Quality Assurance and Accreditation, Skills and Ability Enhancement, Policy Planning to Governance issues. Further with increase in globalization, competitiveness has become a decisive force for growth, necessitating massive investments in higher education.

Criteria - wise Performance of Accredited HEIs of Telangana

Figure 4: Criterion-wise performance of accredited HEIs of Telangana



Performance Analysis of Colleges & Proposed Interventions

Performance analysis of the colleges especially those related to Curriculum; Teaching and Learning; Research and Innovation; Extension and Outreach; Student Placements and Progression to Higher Education and Infrastructure Planning and Development indicate several quality inadequacies in higher education sector of Telangana. Some of the major issues are detailed below:

Supply-Demand Gap

The structure of HEIs consists of considerably large number of small institutions both in terms of size and enrolments. Heavy concentration of HEIs and enrolments in and around Hyderabad, Warangal and Khammam. Overall demand ratios in most colleges are extremely low making its operations unviable. Low enrolments in some programs especially in the STEM related courses and higher enrolment in others such as Computer Science, Commerce, Business Management etc., resulting in underutilization or non-utilization of the facilities created. In PG programs, the enrolment falls down to 12%-13%. Further, uneven growth and access to opportunity in terms of programs and colleges choice, delays in admissions, grant of scholarships, availability of hostel facilities and transportation, etc. also impacted student enrolment. Despite the introduction of DOST portal, making the admission processes more easier, with information of all the colleges available at the click of the mouse enrolments remain skewed both in terms of Program and College choice.The situation is further escalated with Huge dropouts resulting in inflated unit cost and poor graduation rates.

Proposed Interventions:

- Rationalize the colleges with a condition of minimum of 500 and above admissions.
- Engage local bodies in governance of the colleges.
- Improve the implementation modalities of various student support schemes for timely and efficient disbursements such as scholarships and other allowances.
- Strengthen the cluster colleges concept enabling access to the best of facilities and enhance the choice of courses.
- Extensive awareness programs on various course provisions, employment prospects, etc.
- Review admission schedules to avoid delays in admission procedures through DOST and other online processes.

Teacher Quality

Low Quality of Teaching and Learning is the greatest challenge facing the state. Chronic shortage of teachers (30-40% vacancies), poor teacher student ratios (1:30 to 1:50), large numbers of temporary teachers with minimal qualifications and experience, lack of proper training (less than 1% attended FDPs), conventional methods of teaching are some of the major issues plaguing the quality of teaching-learning in the state. Other issues compounding the problem are teachers' qualifications (less than 20% having Ph.D. qualifications), lack of sufficient experience and training (minimal access to Continuous Professional Development Programs), very few teachers take up research and publications. To reverse the deteriorating performance, there is an urgent need to deploy teacher policies and regulations to ensure that teachers are adequately recruited and remunerated, empowered, well trained, professionally qualified, motivated, equitably and efficiently deployed across the system, and supported within well-resourced, efficient and effectively governed systems.

Proposed Interventions:

- Develop teacher assessment framework to gauze current strengths and shortcomings and provide appropriate interventions in terms of Faculty Development Programmes/Continuous Development Programmes.
- Make appropriate policies and provisions for recruitment and retention of teachers including workload and performance-based promotions and professional development (requirements for Career Advancement Scheme, etc. or performance scores for individual initiatives).
- Introduction of fast-track promotion schemes in recognition of exemplary performance in Research, Innovation and Publications as being implemented in premium institutions.
- Make provisions for teachers to attend at least one training program a year. Train Teachers at scale by engaging external tech-partners and using self-guided learning modules (SWAYAM, NPTEL and other MOOCS), Digital Academies or Consortium targeting the range of skills to be fostered as a part of the CPD.
- Engage Teachers in Research, Innovation and collaborations by adjusting workload, incentives and matching funds.
- Develop a framework assigning Accountability and Responsibilities to Teachers and performance appraisal systems mapping to the activities specified within the framework.

The framework shall be inclusive of Teaching, Research and Administrative responsibilities specifying the number of teaching hours per week that a faculty at a given level (Assistant Professor-Associate Professor- Professor) must engage, student support w.r.t. mentoring,

interaction with students beyond classroom, engaging in community and outreach activities, time that faculty must invest in research and the expected research output at the end of a given period and administrative responsibilities.

Quality Teaching and Learning

Increasing access must be accompanied by measures to improve the quality and relevance of education and learning. Education institutions and programs should be adequately and equitably resourced, with safe, environment-friendly and easily accessible facilities; sufficient numbers of qualified teachers, well-equipped laboratories and libraries with books, learning materials, open educational resources and access to technology. Poor Library resources and technology is limiting the student learning both in terms of knowledge and skills. Quality education includes the development of those skills, values, attitudes and knowledge that enable students to make informed decisions and respond to local and global challenges. Not many institutions offer programs in STEM related disciplines. It is essential to strengthen Science, Technology, Engineering and Mathematics (STEM) Education. Pedagogies and assessment are focused on input and rote learning with little opportunity to develop a wider range of transversal skills, including critical thinking, analytical reasoning, problem solving and interdisciplinary/multidisciplinary working. The current system of conventional lecture methods will have to subordinate to the new methods of tech-mediated teaching involving active student participation. Curriculum Enrichment is another weak area and there is a need to engage students in self-learning through various online platforms. Finally, effective and relevant learning outcomes can only be achieved through the provision of quality inputs and instructional processes that enable all learners to acquire relevant knowledge.

Proposed Interventions:

- The Faculty Student Ratio (FSR) must be maintained as per the defined policy. In the Liberal Arts model, where the courses are cross-listed or offered university wide, resulting in higher student numbers in certain courses; Assistant Instructor or Co- Instructors must be appointed to maintain the Faculty Student Ratio (FSR).
- Deploy technology and digital resources for enhanced teaching learning. Appropriate e-learning platforms such as SWAYAM, DIKSHA, be also developed at the state level to provide teachers with a structured, user-friendly, rich set of assistive tools for monitoring the progress of learners. Tools such as two-way video and two way-audio interfaces for holding online classes also need to be deployed at designated centers.
- Define standards and review curricula to ensure quality and relevance to the context, including

skills, competencies, values, culture, knowledge and gender responsiveness. Systems and practices for assessment of quality learning that include evaluation of inputs, environments, processes and outcomes should be instituted or improved.

- Relevant learning outcomes must be well defined in cognitive and non-cognitive domains, and continually assessed as an integral part of the teaching and learning process.
- Monitoring mechanisms by obtaining systematic, reliable and updated data, and information through formative and/or continuous (classroom-based) assessments and summative assessments at different levels should be put in place.
- Establish digital libraries and learning resource centers in all villages with provision for students to access online resources and pursue courses through SWAYAM/NPTEL and other Massive Open Online Courses (MOOCs) to earn required credits and also additional knowledge and skills.

Curricular Reforms

Analysis of the Curriculum offered by the Universities of the state either on their campuses or in the affiliated colleges is outdated, rigid and inappropriate. Apart from work-specific skills, emphasis must be placed on developing high-level cognitive and non-cognitive/ transferable skills such as problem-solving, critical thinking, creativity, teamwork, communication skills, etc., which can be used across a range of occupational fields. Curriculum revision and development processes need to be revamped by making it more evidence-based, engaging community and industry partners in designing and delivering curriculum and training programs that are of high quality, and include both work-related skills and non-cognitive/ transferable skills including entrepreneurial, basic and Information Communication Technology (ICT) skills. Promote different forms of work-based and classroom-based training and learning; flexible learning pathways in both formal and non-formal settings; enable learners to accumulate and transfer credits for levels of achievement; recognize, validate and accredit prior learning; and establish appropriate bridging programs and career guidance and counselling services. Further establish processes to evaluate impacts and outcomes of higher education policies and programs, and to collect data on the transition from learning to the world of work and on the employability of graduates, and dove tail the inputs to curriculum revision. Strengthening Alumni Connect and Industry-Institute Connect is an important component in the process.

Proposed Interventions:

- The CCE (Commissionerate of Collegiate Education) or the TSCHE should develop uniform curriculum for UG programs, with 20% to 40% flexibility for the inclusion of online/ offline institution specific courses as adopted successfully in states like U.P., A.P., M.P. etc.

- Constitute Advisory Committees for Curriculum Development and setting benchmarks/ make necessary suggestions to the Board of Studies (BoS). With members from with-in the state and across the country, the committee will advise on the inclusion of locally and globally relevant areas of studies, orient faculty towards designing, formulating and implementing multidisciplinary curriculum and assessment at the level of the HEIs.
- Based on the experiences, upscale the AEDPs (Apprenticeship Embedded Degree Programs), implemented successfully in 26 HEIs of Telangana with industry-led curricula and apprenticeship linkage providing students with hands-on-work exposure and earn while they learn.
- Similar to the initiative of Andhra Pradesh and Maharashtra, provide a comprehensive framework for rolling out the semester long internship/ apprenticeship component.
- Establish Internship and Placement Cells to facilitate internships and placements of students. Either they may be within the institute as in case of Maharashtra or district level committees to be headed by the Collector.
- Restructure the institutional provisions to offer digital learning, MOOCs and other online courses and necessary amendments in the University regulations for credit transfers for these courses.
- In line with the National Reforms, plan for transiting to Four Year Multidisciplinary Programs (UG).

Research and Innovation

While there are several organizations like the Telangana Academy of Sciences (TAS), Telangana State Council for Science and Technology (TSCOST), with low enrolment at Ph.D. levels, the state does not get high quality researchers. Further with fewer opportunities for interdisciplinary and multidisciplinary working, lack of early-stage research experience, a weak ecosystem for innovation and low levels of industry engagement, separation of research and teaching, HEIs have scored very low on the research and publications criteria both at NAAC, NIRF and International Rankings. The interplay of Innovation, utilization of technology and entrepreneurship play a great potential in transforming the education ecosystem. In order for these three elements to produce synergies necessary to transform education, we need to build a collaborative architecture that allows for the fruitful integration of Research and Development and Innovation. Though several attempts are made in this front by establishing TAS, TSCOST, CESS etc. the progress has been not very encouraging at the university level. Though as many as 115 Institution Innovation Cells (IICs) have been established, hardly 10 -15% of them are only active. To improve our Research and Inventive performance, it is essential that every institution establish an IIC and proactively engage students, teachers and community.

As per the Intellectual Property Report (IPR) of 2021-22, Telangana was ranked 06th in terms of filing of patent applications in the country. In terms of design, the state stood 13th and 09th in terms of trademark filings in the country. Unfortunately, not much is contributed from the universities and colleges. The system should take advantage of the rich base of R&D, Pharma, Life Sciences and a lot of emerging tech work happening in Telangana, and enhance the R&D profiles and build research capabilities. The patent filing fee has been reduced to 75% for all educational institutions along with Micro, Small & Medium Enterprises (MSMEs), startups, and individuals which further works to the advantage of the HEIs. With a huge ecosystem of startups and entrepreneurial ecosystem, HEIs in Telangana have the potential to emerge as research hubs and rank among the top globally.

Proposed Interventions:

- Enabling policies need to be developed for HEIs to focus on research and innovation by setting up start-up incubation centres; technology development centres; centres in frontier areas of research; greater industry-academic linkages; and undertake interdisciplinary research especially in humanities and social sciences.
- State budgets do not have a component for research. Allocate at least 10% specifically for research in the HEIs budgets.
- Establish Research Centres at college level and recognize eligible college faculty as Ph.D. supervisors.
- Evolve mechanisms to connect institutions with R&D establishments, industry, T-Hub, etc.
- Set clearly defined goals and timelines for faculty to be attained against Teaching, Research and Administrative Work/ Community Service on the basis of which their performance would be assessed for furthering their careers.
- To gauge research output of faculty, evolve assessment procedures considering both qualitative and quantitative measures.
- Institution-level Awards for excellence and innovation in teaching and research.
- Capacity building measures to train and orient faculty for research by HEIs.
- Evolve appropriate policies and facilitate in developing a purposeful interface between the Universities, Colleges, Industries and National Research Laboratories for engaging the faculty in research activities and making the latest and sophisticated equipment available for HEIs.
- Develop policies and programs that reinforce the research function in Colleges and University curriculum through the early uptake of STEM fields.

Accreditation and Ranking

Quality requires systems for managing teachers, governance, accountability mechanisms and strong public financial management. Another trend is the increasing mobility of staff and learners, and the flow of students moving abroad to enhance academic credentials. As a consequence, the comparability, recognition and quality assurance of qualifications has become a growing area of concern. At the same time, mobility in tertiary education is an asset and an opportunity that should be enhanced to develop students' competencies and global competitiveness A well-established, properly regulated tertiary education system supported by technology, open educational resources and distance education can increase access, equity, quality and relevance, and can narrow the gap between what is taught at tertiary education institutions including universities, and what economies and societies demand. The provision of tertiary education should be made progressively free, in line with existing international agreements.

Proposed Interventions:

- Ensure quality assurance, comparability and recognition of tertiary education qualifications and facilitate credit transfers between recognized tertiary education institutions.
- Establish Institutional Quality Assurance Cell to plan, implement and monitor the performance.
- Strengthen international cooperation in developing cross-border tertiary and university education and research programs, including within the framework of global and regional conventions on the recognition of higher education qualifications, to support increased access, better quality assurance and capacity development.
- Mandate preparation of Institutional Development Plans (IDPs) for all HEIs.
- All eligible institutions must get accredited by NAAC and participate in NIRF ranking.
- Establish State Level Quality Assurance Cell (SLQAC) for ensuring the quality of educational provisions against mapped benchmarks.

Governance

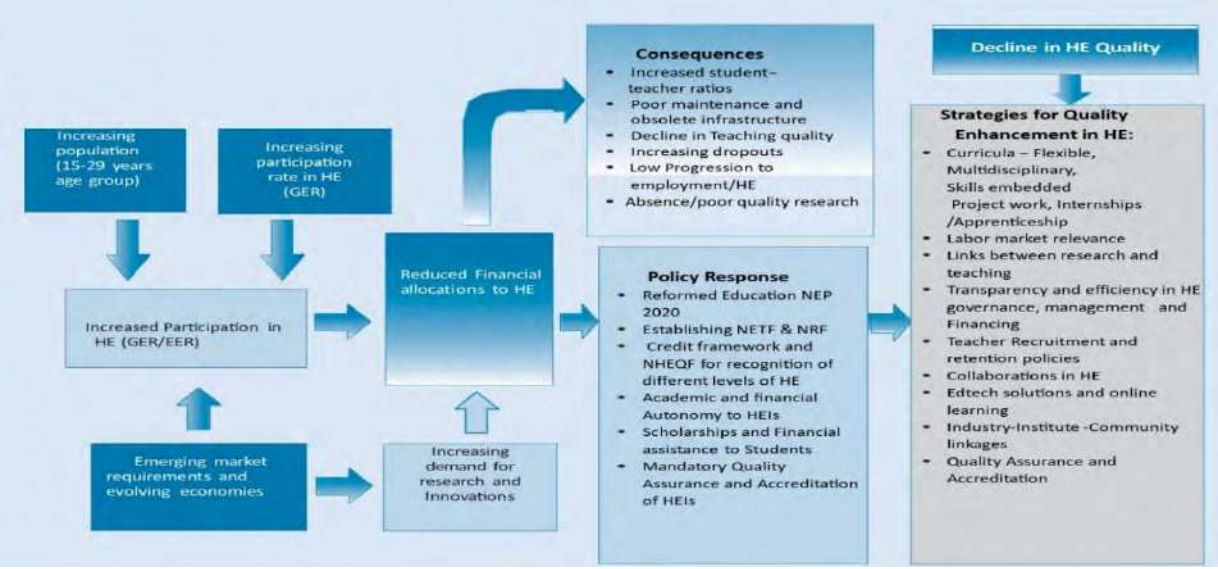
Reforms in higher education will first require that the broad policy framework within which the HEIs operate is improved. This implies granting more autonomy, that encourages institutional differentiation so that institutions are able to adapt to their local contexts and to respond more clearly to student and market demands. Universities function within an environment that is very much subject to government regulation and control. Most of the Universities of the state

are overwhelmingly dependent on government funding. Often underfunded, many have been inefficient in terms of resource utilization, staffing patterns and student enrolments. Further fluctuations in annual funding makes planning and continuity highly impossible. Hardly, any University or College has their strategic plan document in place. Poor planning has resulted in adhocism in many of its functions. Overregulated and underfunded institutions have little capacity to redeploy resources to meet access requirements or quality. This has resulted in opening new programs and courses in inexpensive fields which are increasingly divergent form the demands of job markets and students. Economic deterioration combined with policy weakness has resulted in rapid decline in institutional quality and efficiency. Purely ad-hoc budgets and annual grants dependent on the available state resources has resulted for most Universities into a means to avoid confronting the problems of rapid expansion without resources.

Proposed Interventions:

- Strengthen the efficiency and effectiveness of institutional leadership and governance through greater involvement of communities, including young people, employers and parents in the management of institutions.
- Allocate resources more equitably across socio-economically advantaged and disadvantaged HEIs., and across programs.
- Funding should be based on IDPs i.e., direct allocations for operational expenses, earmarked funds for research and equipment, and matching grants & development grants.
- With almost 50% of the financial allocations going towards scholarships, it is time to review and reframe the scholarship scheme by taking a differentiated approach where students compete for support. Gradually, we need to move towards loans instead of scholarship grants.
- To improve access, develop policies and programs for the provision of quality distance learning, with appropriate financing and use of technology, including the internet,
- MOOCs via SWAYAM/ NPTEL/ DIKSHA platforms and other modalities that meet accepted quality standards.
- Promote higher education as well as adult learning, education and training opportunities for young people and adults of all ages and socio-cultural backgrounds so as to enable them to continue to improve and adapt their skills to the changing market requirements.

Issues, Challenges and Strategies for quality enhancement of Higher Education. In a nutshell!



Conclusion

The suggested reforms and interventions would substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent work and entrepreneurship. The major objectives of the reforms are:

i. Transforming existing curricula across disciplines offered by HEIs into multi- disciplinary liberal curricula.
ii. Capacity-building of HEIs and faculty for formulation and implementation of a reformed framework.
iii. Integrating CBCS (Choice based credit system) in the curriculum design and implementation, granting greater freedom to learners to opt for different courses beyond the core subjects of their discipline, depending on their interest and credit requirement of the course.
iv. Improved access to quality education using Ed-Tech solutions and options for blended mode of learning (online and in-class learning).

Action Points

- Formulation of a state-level committee to develop a broader framework for multidisciplinary Liberal Arts Education embedding the CBCS provisions and self- learning components. This committee may comprise of subject experts, industry experts, and educationists from diverse HEIs, particularly from leading institutions and research establishments and industry.

- Set up an Academic Internal Audit Team at the level of an institution for mapping the existing disciplines and infrastructure of institution to envisage the scope of tech- embedded, multidisciplinary education and appropriate allocation of budgets for the same.
- Formulation of an institution-level committee with faculty representatives of each department and external members to develop a holistic and multi-disciplinary curriculum, breaking the binaries of Arts-Science-STEM Education.
- All HEIs in the state must be accredited as mandated at the national level.
- HEIs to organize consultative workshops with industry and subject experts from universities with-in the state and across the country, to identify locally and globally relevant areas of studies to orient faculty towards designing, formulating and effectively implementing multidisciplinary curriculum and assessment at the level of HEIs.
- Adopting a bottom-up approach, allowing for greater participation of faculty in curriculum design and granting autonomy to faculty members to envisage programs, design courses depending upon their expertise and areas of research. These courses may be cross-listed as electives or core courses based on graded autonomy regulations for colleges.
- Curriculum development workshops and trainings to be conducted for faculty for developing output-driven curriculum which can be run on both online and offline modes.
- HEIs to organize courses and workshops for orienting faculty towards pedagogical practices including activity based, field-based, project/lab based, practicum/internship based, community-based learning depending on type of program or course being offered.
- Setting up start up Incubation Centres in HEIs to promote technological development, inter-disciplinary research, industry-academia linkages for all programs offered by the HEI to enhance relevance of the course and graduate employability.
- HEIs to constitute committees to facilitate internship for every course offered by them either through offline or online mode. To achieve this, focus should be on building relation between academia and industry to facilitate learning by doing for students through internship/apprenticeship and field work to promote employability.
- Establishing an annual curriculum review mechanism for every course by the HEI to keep the curriculum up to date by setting up a university wide Curriculum Review Board as a permanent body at the level of HEI to maintain and sustain quality and relevance of courses offered by HEIs. It is recommended that curriculum is reviewed at least annually and updated periodically by faculty which is then shared with the review board with the scope of inculcating the feedback received from the board.
- HEIs to develop program that includes independent capsule courses that are complete in themselves of differing durations leading to the grant of certificate, diploma or degree and facilitating multiple exits and entries.
- HEIs to develop a mechanism for mutual recognition of credits that would allow admission to

courses in addition to full-time programs and recognize credits acquired by the students from different HEIs, accepting lateral entrance to their courses.

- To develop courses that require students to engage in assistantship and internship, as a compulsory/graded component of the course. This shall facilitate learning by doing and enable learners to specialize in a field of study.
- Develop a 4-year program that includes the scope of pursuing research at UG level including internships/apprenticeship, teaching assistantships and working on independent research projects.
- To instill the spirit of life-long learning among learners through offline and online courses, and establishment of centres for learning by the government for continued learning of students and staff beyond educational institutions.
- Make and pass ordinance that allows HEIs to facilitate credit transfer between Indian and foreign universities.
- Appointment of Academic Advisors to guide students to design and opt for courses as per the credit requirement of the course-program being pursued by the students.
- Create activities for physical fitness:
    - On campus activities.
    - Tie-up with local centres, in case campus does not have infrastructure.
    - In-room activities which don't need additional infrastructure such as yoga.
- Reform the system of examination to include formative assessments and summative assessments.
- Identify centralized ODL committee of academics, education technology experts and private players engaging in online learning to build high quality e-resources, OERs and MOOCs, and innovate on assessment methodologies corresponding to the demands of programs offered.
- Build the central repository with shared and open access resources for online programs and ODLs.
- Develop an institution specific Internal Quality Team with Monitoring and Evaluation process.

To ensure quality education and witness effective education outcomes, government should strengthen education systems by instituting and improving appropriate, effective and inclusive governance and accountability mechanisms; quality assurance; education management information systems; transparent and effective financing procedures and mechanisms; and institutional management arrangements, as well as ensure that robust, timely and accessible data are available for making right choices and decisions. Innovation and ICT must be harnessed to strengthen education systems, for disseminating knowledge, access to information and effective learning. For a state like Telangana that hosts several corporate and industry establishments, education and training policies are also expected to address rapidly changing needs for youth and

adults to improve their skills and learn new ones. Appropriate priorities and strategies need to be developed to build learning pathways between different educational streams and facilitate the transition of work.

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Advancing Higher Education in General Degree Colleges through Research in Telangana

Surbhi Kak[2], Dr. J Achyutha Devi[3], Dr. G. Suhasini[4], Dr. D. Ramakrishna Reddy[5], Ch. Pranitha[6]

Introduction

'Research is to see what everybody else has seen, and to think what nobody else has thought" – Albert Szent-Gyorgyi

Higher Education (HE) plays a crucial role in society by creating new knowledge, transmitting it to students, and fostering innovation. Universities and Colleges are among the direct contributors towards innovation and research, particularly in emerging economies. Research-based education provides a foundation for educational planning, making it one of the main fields to be embedded in higher education curriculum (Niemi & Jakku-Sihvonen, 2006).

Research holding the Torch of Knowledge (1896)

Library of Congress, Washington DC

Who is a researcher?

Knowledge in any field is gained through research. A researcher is someone:

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[4] Dr. G. Suhasini, Asst. Professor, Head, Department of Zoology, Pingle Government College for Women, Hanmakonda
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[6] Ch. Pranitha, Former Student, Research Lead, Pingle Government College for Women, Hanmakonda

Who develops new models to explain existing data and predict new results.
Who tests models by making measurements and exhibit strong curiosity about reality.

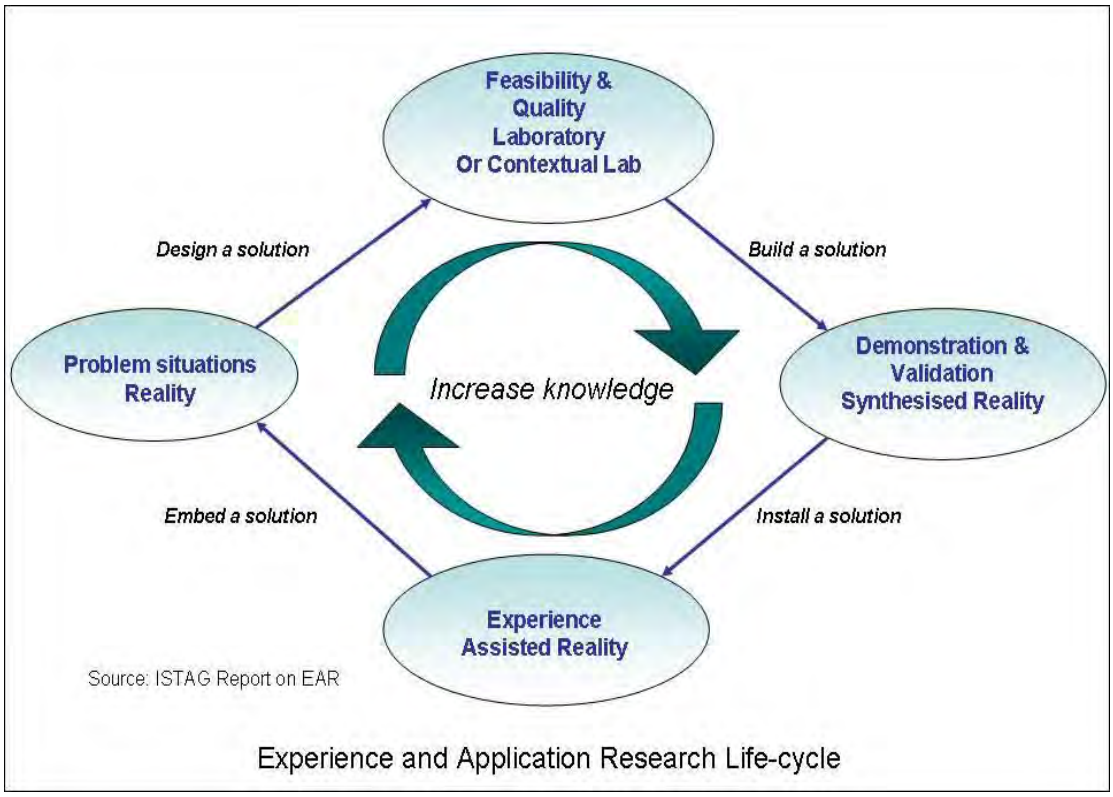


Figure 1: Research Life Cycle

Research and Higher Education

Figure 2 depicts the various components that need to function efficaciously to build a dynamic research ecosystem.

Figure 2: Major components of research ecosystem

Advantages of Research

Research is the primary means of generating new knowledge, and it contributes to the advancement of knowledge and understanding in a particular field or discipline. Figure 3 encapsulates the major advantages of research in higher education:

Figure 3: Major advantages of research

Research manpower at various levels in a higher education institution

In a higher education institution, research ecosystem can only be developed if students and faculty (at various subsets) are engaging in activities that are complimentary to their academic level. The following diagram highlights such activities.

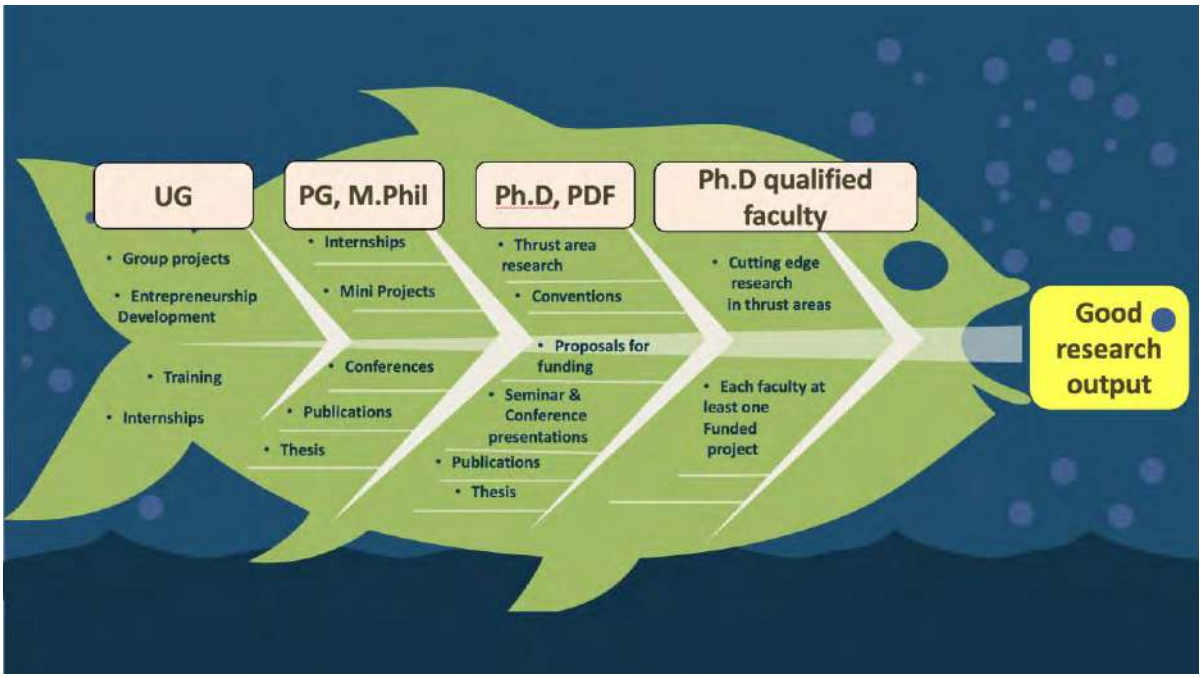


Figure 4: Research manpower at various levels

Universal Code of Ethics for Researchers (*Sir David King, UK, 2007*)

Research involves intense ideation and developing/deriving novel solutions to pre-existing problems. Conducting and surviving the various stages of research is not an easy or straight forward task. The mental toil and invested time often leading to an intellectual biproduct might seem rudimentary in the large scheme of things, but proving or disproving or executing idea is worth a million dollars (literally or otherwise). Thus, integrating ethics within the practice of research is imperative. Some of the code of ethics to be kept in mind are enclosed below:

- Act with skill & care in all research work. Maintain up to date skill and assist their development in others.
- Take steps to prevent corrupt practices and professional misconduct. Declare conflicts of research.
- Be alert to the ways in which research derives from and affects the work of other people and respect the rights and reputations of others.
- Ensure that your work is lawful and justified
- Minimize and justify any adverse effect your work may have on people, animals and the natural environment.
- Seek to discuss the issues that your research raises for society. Listen to the aspirations and concerns of others.
- Do not knowingly mislead or allow others to be misled. Present and review precise evidence, theory or interpretation honestly and accurately.

Research Opportunities

Often the drive for research is not actualised due to lack of access to relevant sources of information. As the correct information doesn't reach the individual timely, it leads them missing out on various opportunities to acquire research grants. Information is power, and knowing the correct sources to acquire funds for your research is the key. There are **various sources of research funding available from national and international sources that have been attached in the Appendix** of this document. Browsing through these websites on regular intervals is very important to keep oneself updated on the new research opportunities.

Another aspect that is extensively important in securing a research grant is the submission of a robust research proposal. Writing a proposal is a composite task where enough detail needs to be integrated for the reader to understand the research idea and gauge the potential impact. It needs to be concise and focused with the following key components:

1. Title: Should reflect the focus of the research.
2. Introduction: Background of the problem statement and state the research question and objectives.
3. Objectives: Expand further on the objectives that you aim to achieve through the research. It needs to be linked to the research question.
4. Literature Review: One of the most important sections of the proposal that will not only help to contextualise your research but will also help in highlighting the need for your study by identifying the gaps in the pre-existing literature.
5. Methodology: This includes research design, data collection methods, any other analytical techniques.
6. Significance: In simple words it should highlight, "Why is this research important?"
7. Timeline: This section provides a schedule highlighting the key activities and milestones.
8. References: Plagiarism represents a critical offense within academic and stands as a significant transgression undermining the integrity and originality expected in scholarly work. Thus, the list of cited references should be carefully included and formatted according to the required citation style.
9. Budget: Should outline the anticipated expenses related to your research activities.
10. Appendices: Should include any additional information, such as survey instruments, consent forms, or detailed project plans.

The various sources of "How to write a research proposal?" have been attached in the Appendix.

Current Scenario of Telangana

Higher Education in Telangana plays a pivotal role in shaping the state's future by producing a skilled workforce, promoting innovation, and addressing societal challenges. Telangana is home to numerous HEIs, including universities, colleges, and technical institutions. Osmania University, established in 1918, is one of the oldest and most prestigious universities in the state. Other prominent institutions include Kakatiya University, Jawaharlal Nehru Technological University, and RGUKT, etc. Telangana has a reputation for academic excellence, with several institutions ranking among the top in the country. The Government Degree Colleges (GDCs) across the State have become synonymous with quality education along with the best infrastructure in place.

Telangana is one of a few States in the country with the highest number of GDCs receiving accreditation. Out of the 137 GDCs in the state, **94 colleges** i.e., **68.61 %** of GDCs are accredited by NAAC having valid accreditation. Out of the total accredited GDCs, **15.95% (15 GDCs)** are accredited with 'A' level grades (A, A+, A++), **69.14% (65 GDCs)** are accredited with 'B' level grades (B, B+, B++), and **14.89% (14 GDCs)** are accredited with 'C' grade.

Hyderabad, the capital of Telangana, is known as "Cyberabad" due to its robust IT industry. Research in IT and ITES, including areas like artificial intelligence, data science, and cybersecurity, has been a significant focus of Telangana. The state has a growing pharmaceutical and biotechnology sector, and research in drug discovery, genomics, and biomedicine has been on the rise. Telangana has been emphasizing research in agriculture, particularly in improving crop yields and sustainable farming practices. Biotechnology research, including genetically modified crops, has gained attention. Given the importance of water resources in the region, research on water management, conservation, and groundwater recharge has been a priority. Research into renewable energy sources, such as solar and wind power, aligns with the state's efforts to promote sustainability. As part of Quality Initiatives, the Commissionerate of Collegiate Education (CCE), Government of Telangana, has proposed to bring out two Research Journals in areas of Commerce & Business Studies, and Social Sciences i.e. Telangana State Journal of Commerce & Business Studies and Telangana State Journal of Social Sciences. In this regard, original unpublished Research Papers are invited from the faculty members and scholars on the emerging trends/latest research developments in the broad areas of Social Sciences. The main objective of this Journal is to disseminate the knowledge and research findings related to all sub-areas of humanities and social sciences. It also intends to promote interdisciplinary research and studies in humanities and social science to promote the standard of scientific excellence. The state's HEIs have been actively involved in research and innovation. They contribute to advancements in fields such as science and technology, medicine, social sciences, and humanities. Besides, these universities, Telangana has several research institutes such as the Indian, Institute of Chemical Technology (IICT), Centre for Cellular and Microbiology (CCMB),, National Remote Sensing Agency (NRSA), National Institute of Nutrition (NIN) and some of India's premium defence laboratories and space institutes.

Research Gaps in Telangana

It is important to identify research gaps in HEIs of Telangana for directing efforts towards areas that require further exploration and improvement. While the specific research gaps may vary depending on the institution and discipline, there are some overarching research gaps that could be considered. Based on the NAAC Report titled ‘State Level Analysis of Accredited Higher Education Institutions of Telangana’ published in September 2021, private funded institutions in Telangana are performing better than grant-in-aid and government institutions. It was discovered that the performance of many colleges is below average in ‘Research, Consultancy and Extension.’

As per the Intellectual Property Report of 2021-22, Telangana was ranked sixth in terms of filing of patent applications in the country after Tamil Nadu, Maharashtra, Uttar Pradesh, Karnataka and

Punjab for 2021-22. In terms of design, the state stood 13th and ninth in terms of trademark filings in the country. While Tamil Nadu filed 5,206 patent applications in 2021-22, Maharashtra filed 4,508 applications, Uttar Pradesh filed 3,613 applications, Karnataka filed 3,171 applications, Punjab filed 2,197 applications and Telangana filed 1,724 applications. Telangana has slipped from the list of top five states. With a rich base of R&D, Pharma, Life Sciences, and a lot of emerging tech work happening in Telangana, there is no reason why the numbers cannot get a fillip in the coming years. The patent filing fee has been reduced to 75% for all educational institutions along with MSMEs, startups, and individuals. With a huge ecosystem of startups and entrepreneurial ecosystem, Telangana has potential to emerge among the top 3 states in all the three aspects of IP registrations by 2025.

Identifying and addressing these research gaps in a systematic manner may help Telangana's HEIs enhance their research capabilities, contribute to societal development, and compete effectively on a national and international level. It's significant to conduct a thorough assessment within each institution to tailor strategies to their specific needs and strengths.

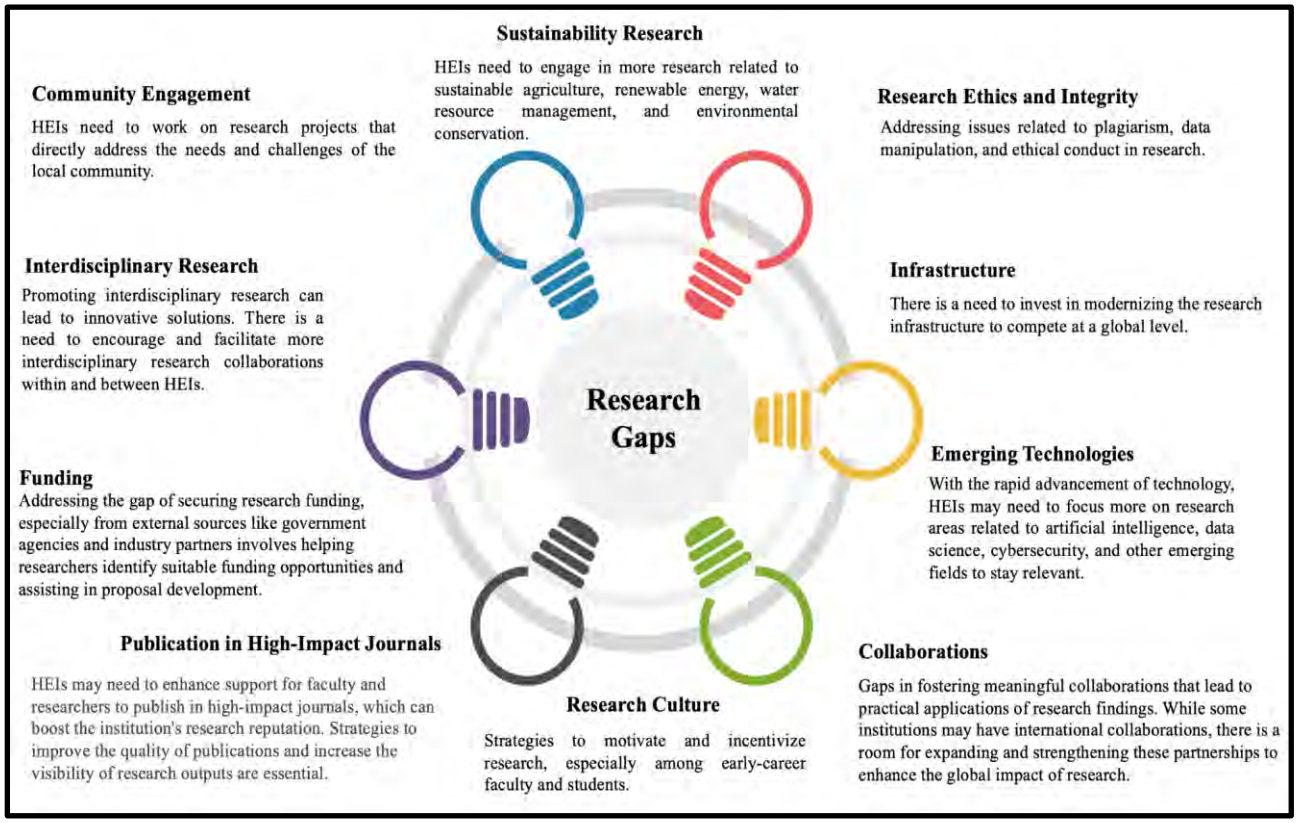


Figure 5: Research Gaps in Colleges of Telangana

Augmentation of Research and Way Forward

To develop pioneers of tomorrow, it is imperative for the higher education system to build quality research capabilities and introduce research standards and accreditations. At an individual level, research enables people to develop depth and breadth of knowledge in their choice of area of expertise as it is a systematic investigation and study of multiple materials and sources. It helps them hone skills associated with problem-solving, knowledge acquisition and understanding. A strong research ecosystem builds a solution driven and a knowledge-based economy; research and innovation assist HEIs to improve their global visibility and rankings. Telangana boasts of delivering accessible and quality higher education to the students through its higher education ecosystem. Augmenting research in the state will not only improve quality but also leverage the soft power of research to build the brand Telangana. Fostering a research culture in Telangana's higher education institutions requires a strategic approach that involves various stakeholders, including students, faculty, administrators, and policymakers.

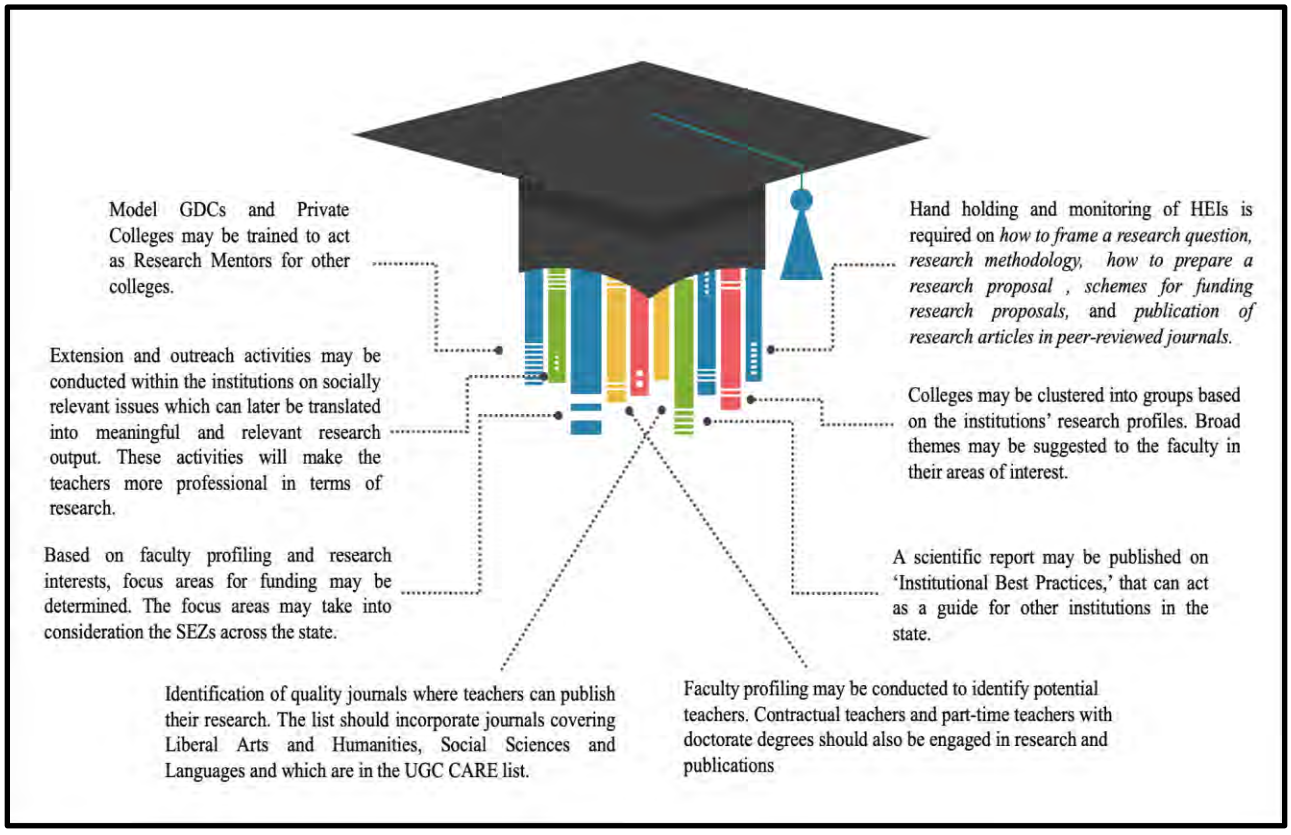


Figure 6: Research Plan suggestions

The following or similar activities need to be initiated to ***create research readiness, promote research acceptance,*** and ***track research progress.***

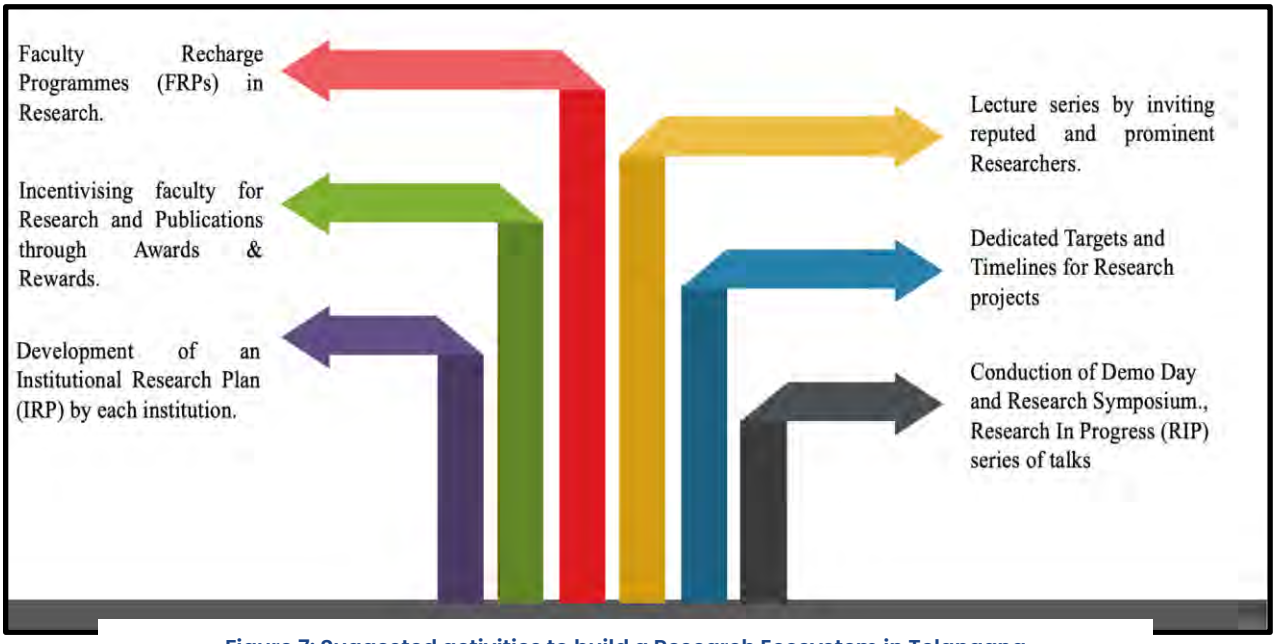


Figure 7: Suggested activities to build a Research Ecosystem in Telangana

While these initiatives might be highly effective in begetting good research results for the institutions, they are time taking and involve - strategic planning, increasing research training of both administration and faculty, and increasing awareness regarding the various avenues for collaboration. It is also true that the drive or motivation for research needs to start at the department or institutional level, where often the plethora of research challenges demotivate the faculty. Thus, a lucrative and sustainable manner of conducting significant research can involve engaging with the community. Most of the colleges undertake extension or outreach activities and are involved in many contextual and grounded social awareness activities. In today's globalised world where local is global, such kind of activities can be translated into meaningful research can often add depth and diversity to the academic literature. It needs to be understood that **research does not happen in vacuum and cannot be segregated from the socio-cultural-economic context. Small incremental steps, utilising the existing resources can both lead to the betterment of the society and enrich the research experience and exposure of those involved. This is what we may call as Community Based Research.**

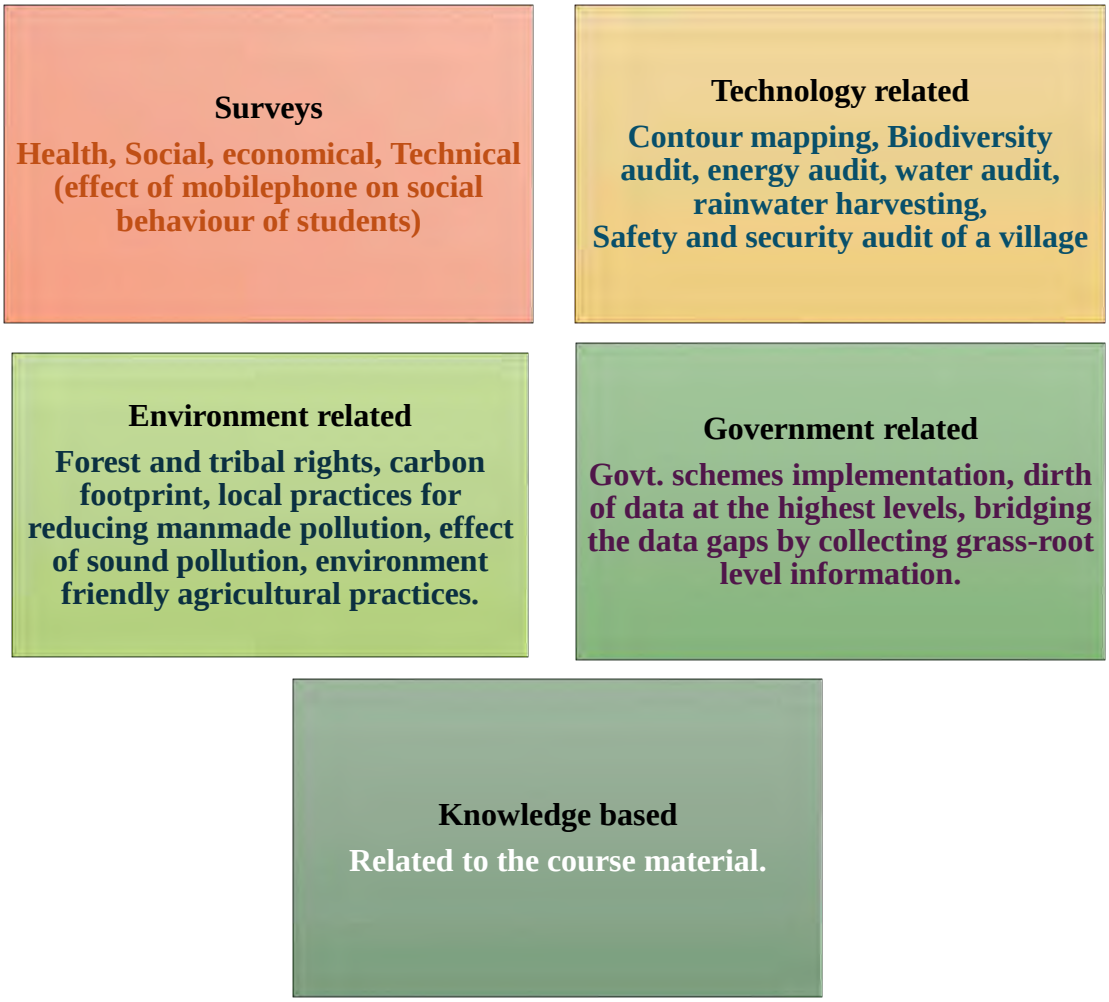
Community based research projects

A community can be understood as an area or place where people live together. It can be identified as the immediate environment, constituted by one's neighbourhood, block, street, village, district, city and so on. An individual forms the community, and the community impacts the existence of the individual within that ecosystem (directly or indirectly). Thus, community-based research can be understood as the engagement of an individual with his/her community to better understand an aspect within that ecosystem or to offer solutions to problems that might be negatively affecting the community.

The primary features of community-based research are that it is participatory in nature, involving cooperation between community members and researchers. It is a co-learning process where the primary purpose is to either build capacities, empower the community by nurturing its strengths, or develop effective systems. It bridges the gap between real-life application and academic learning. In this research process, those involved get sensitized towards the social realities and develop problem-solving and critical thinking skills. They imbibe a sense of social responsibility and develop research skill sets such as organisational skills, planning-execution-evaluation, interpersonal skills, research methodologies, and communication skills.

There is a lot of scope for community-based research in India due to the increased focus of the Government on 'One Data, One Nation.' In the last decade, there has been a digital revolution in India where strengthening grass root level data sets has been accorded immense importance. Also, India as a country implements a lot of state and central Government schemes. However, often there is a lag in the recording of the precise data of beneficiaries. Another area, where community-based research can play a monumental role in India is to identify the gaps between policy design and their on-ground impact. The Unnat Bharat Abhiyaan (UBA) Scheme, launched in 2014 by then MHRD (now MoE) to promote rural development through higher education institutions in India offers another scope area for conducting research.

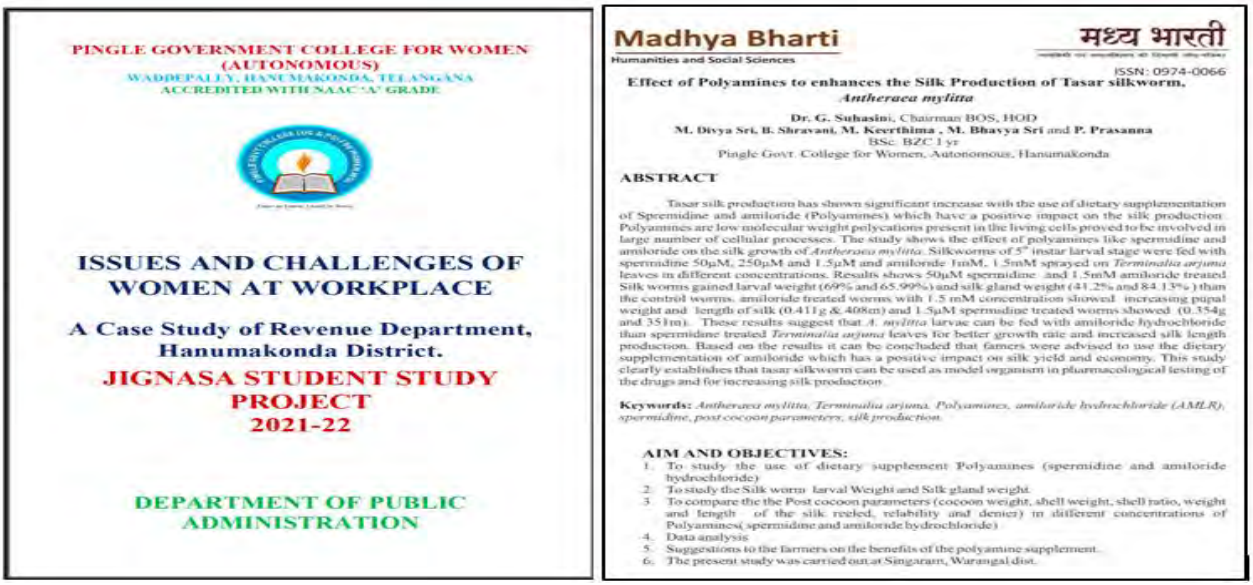
Examples of extension and outreach Activities being used for problem solving, and eventually also contributing to the academic literature:



Source: (Dusane, 2020)

Community based research projects: Case Studies

The following two case studies briefly encapsulate the community-based, student-led research projects undertaken by professors from two different departments of Pingle Government College for Women, Telangana.



PINGLE GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS)
WADDEPALLY, HANUMAKONDA, TELANGANA
ACCREDITED WITH NAAC 'A' GRADE

ISSUES AND CHALLENGES OF WOMEN AT WORKPLACE

A Case Study of Revenue Department, Hanumakonda District.

JIGNASA STUDENT STUDY PROJECT
2021-22

DEPARTMENT OF PUBLIC ADMINISTRATION

Madhya Bharti
Humanities and Social Sciences
मध्य भारती
ISSN: 0974-0066

Effect of Polyamines to enhances the Silk Production of Tasar silkworm, *Antheraea mylitta*

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BSc. BZC 1 yr
Pingle Govt. College for Women, Autonomous, Hanumakonda

ABSTRACT

Tasar silk production has shown significant increase with the use of dietary supplementation of Spermidine and amiloride (Polyamines) which have a positive impact on the silk production. Polyamines are low molecular weight polycations present in the living cells proved to be involved in large number of cellular processes. The study shows the effect of polyamines like spermidine and amiloride on the silk growth of *Antheraea mylitta*. Silkworms of 5th instar larval stage were fed with spermidine 50µM, 250µM and 1.5µM and amiloride 1mM, 1.5mM sprayed on *Terminalia arjuna* leaves in different concentrations. Results shows 50µM spermidine and 1.5mM amiloride treated Silk worms gained larval weight (69% and 65.99%) and silk gland weight (41.2% and 84.13%) than the control worms. amiloride treated worms with 1.5 mM concentration showed increasing pupal weight and length of silk (0.411g & 408cm) and 1.5µM spermidine treated worms showed (0.354g and 351m). These results suggest that *A. mylitta* larvae can be fed with amiloride hydrochloride than spermidine treated *Terminalia arjuna* leaves for better growth rate and increased silk length production. Based on the results it can be concluded that famers were advised to use the dietary supplementation of amiloride which has a positive impact on silk yield and economy. This study clearly establishes that tasar silkworm can be used as model organism in pharmacological testing of the drugs and for increasing silk production.

Keywords: *Antheraea mylitta, Terminalia arjuna, Polyamines, amiloride hydrochloride (AMLR), spermidine, post cocoon parameters, silk production.*

AIM AND OBJECTIVES:

1. To study the use of dietary supplement Polyamines (spermidine and amiloride hydrochloride)
2. To study the Silk worm larval Weight and Silk gland weight.
3. To compare the the Post cocoon parameters (cocoon weight, shell weight, shell ratio, weight and length of the silk reeled, relability and denier) in different concentrations of Polyamines(spermidine and amiloride hydrochloride)
4. Data analysis
5. Suggestions to the farmers on the benefits of the polyamine supplement.
6. The present study was carried out at Singaram, Warangal dist.

Figure 8: Community based research projects undertaken by professors of two different departments of Pingle Government College for Women, Telangana

Effect of Polyamines to enhance the Silk Production of Tasar Silkworm, Antheraea Mylitta,

Under the guidance of Dr. G. Suhasini, Asst. Professor, Head, Department of Zoology. Students: BSc. BZC I Year. M. Divya Sri; B. Sravani; M. Bhavya Sri; P. Prasanna[7]

The ideation for this study emerged as byproduct of a workshop conducted at the institution which was aimed at introducing students to the fundamentals of research, involving discussions on the needs of local industries and the prevalent local traditional practices. Tasar silk production, is a critical economic activity in the Hanamkonda district of Telangana which caught the students' interest. They learned about the challenges faced by silk producers and saw an opportunity to contribute scientifically to this field, ultimately enhancing the quality and yield of silk through their research on polyamines. This project provided a unique intersection of biology, chemistry, and community service, making it an ideal choice to showcase the students' academic skills while addressing a real-world problem.

[7] M. Divya Sri; B. Sravani; M. Bhavya Sri; P. Prasanna – are students from Pingle Government College for Women, Hanmakonda who worked in the research project 'Effect of Polyamines to enhance the Silk Production of Tasar Silkworm, Antheraea Mylitta'

The outcome of this project was remarkable, with a significant increase in silk production observed in the treated silkworms. Particularly for the farmers, the outcome was highly positive. After completion of the project, the college team created awareness among farmers about the benefits of using polyamines in silk production. This knowledge transfer was aimed to significantly boost their yields and income. Also, the involved students gained valuable research experience and developed a deeper understanding of scientific methodologies. Their work was recognized on a prestigious platform, Jignasa, an initiative by the Commissionerate of Collegiate Education, Government of Telangana, involving 132 colleges and 1.5 lakh students. Winning the best project award and a cash prize of Rs 30,000/- significantly boosted their confidence and motivation. Additionally, the project had a direct impact on the community, as students conducted surveys on seasonal diseases in slum areas and distributed organic mosquito repellent dhoop sticks they had created as part of their research. Inspired by the recognition and support received, the students decided to publish their findings. The project was published in a UGC Care Journal, contributing to the academic body of knowledge and providing them with the experience of professional academic publishing.

This project is a clear example of a combination of academic curiosity and community needs. It entails the aspects of fostering innovation, promoting sustainable practices, empowering communities, and enhancing the economic and environmental resilience of silk production globally.

Issues and Challenges of Women at Workplace: A Case Study of the Revenue Department, Hanamkonda District

Under the guidance of: Dr. D. Ramakrishna Reddy, Dept. of Public Administration, Students: Ch.Pranitha; R. Shravya; P.Rishika; S.Kasturi; D.Srija; O.Tejaswi[8]

The constitution of India ensures equality and a safe working atmosphere for all its citizens irrespective of gender. Even the UN Sustainable Development Goal 5, target 5., focuses on ending all forms of discrimination against all women and girls everywhere. Even after numerous constitutional obligations, international commitments and government measures women still face issues of discrimination at the workplace. It is in this context, that this study was conducted by the students of the Department of Public Administration. As the Revenue department is the

[8] Ch.Pranitha; R. Shravya; P.Rishika; S.Kasturi; D.Srija; O.Tejaswi: are students of Pingle Government College for Women, Hanmakonda who worked on the research project 'Issues and Challenges of Women at Workplace: A Case Study of the Revenue Department, Hanamkonda District '

powerhouse of the state with extensive public interaction and several executive actions, it was considered as the potential department to conduct the study. Time and budget constraints were also kept in mind. The project commenced with several visits to the integrated district collectorate office of the Hanamkonda district as well as other mandal revenue offices.

The objective of the study was to understand the issues and challenges faced by women in the Revenue department. An exploratory study was conducted through semi-structured questionnaires. Overall, a sample of 100 women employees was collected through personal interviews, focussed group discussions, or informal interactions. The interactions with the female workforce of the department made the students aware of the wide range of issues and challenges faced by them at the workplace. As per their analysis of the accumulated data, 60% of the sampled women employees expressed their concerns about the lack of basic infrastructural facilities such as separate washrooms, waiting halls, and creche facilities. 70% of them expressed that they face disobedience from their subordinates and colleagues. 50% of those interviewed expressed that they have either faced or noticed mental/physical or verbal harassment at the workplace while discharging their duties. Single and widow workforce being even more vulnerable. 60% of the women employees expressed that they even face disobedience and harassment from the public. Most of the women expressed that they are unable to spend quality time with their family due to the nature of their work, 85% of them expressed that they work even during odd working hours. 75% of them expressed that they work as much as their male counterparts. But still, they feel hesitant to some extent to work with their male colleagues as they generally underestimate women's capabilities. Not just that most of them expressed that they feel alienated and uncomfortable in situations because of the male dominance existing in the department. Beyond the issues recorded by the students, they also noted that no mandal office or Integrated district collector office has the mechanism for grievance redressal in effect.

From this research study, they clearly understood that mere encouragement of women to join the workforce can never suffice, instead focus must be shifted towards providing basic facilities and redressal mechanisms so that women continue their presence in formal institutions.

The process of conducting this research study not only exposed the students to the field, but it also introduced them to the role of research in identifying problems in society and offering viable policy level solutions. The study helped them to acquire skills in research methodologies, formulating survey questionnaires, data collection, and its analysis. Most importantly it sensitized them to the immediate reality around them, bridging the gap between academic learning and the actual world. Overall, this exposed them to the advantages of research and evoked in them a certain degree of aspiration for academic progression.

Research Collaborations: A case study of R.B.V.R.R. Women's College, Dr J Achyuta Devi, Principal, R.B.V.R.R. Women's College, Hyderabad

Research collaborations are increasingly essential for higher education institutions (HEIs) aiming to achieve the status of Institutes of Eminence. These collaborations involve partnering with one or more external institutions to advance specific, shared scientific research goals, pushing the boundaries of knowledge. Collaborations can include co-authorship, building research networks, joint research proposals, and forming research partnerships. Institutions involved in these collaborations can mutually benefit from the exchange of ideas, knowledge, capabilities, and complementary competencies, fostering research and innovation.

There are five primary types of research collaborations for HEIs:

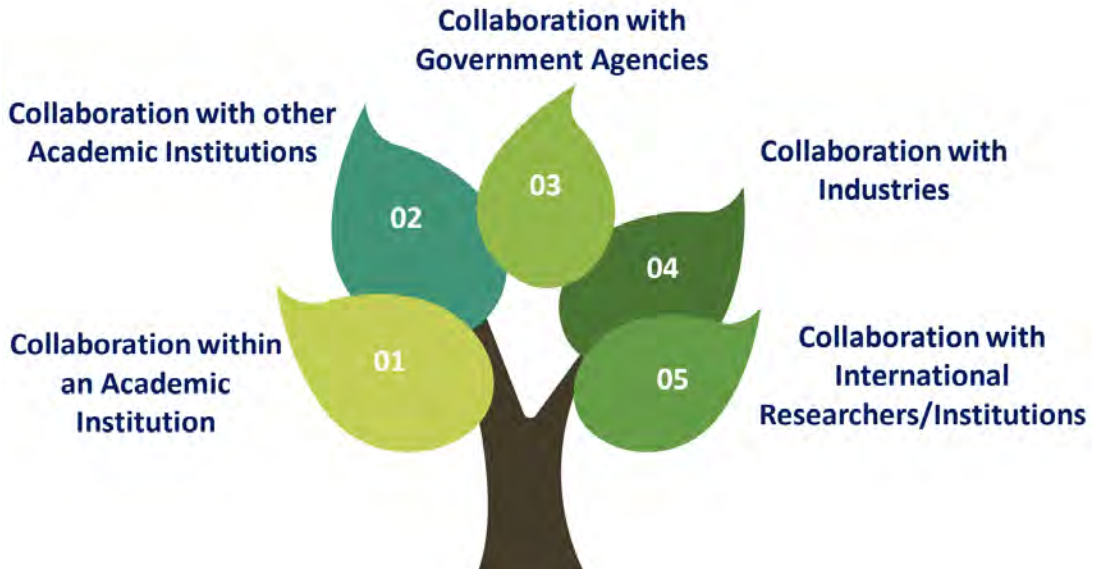

Figure 9: Various types of collaboration options available for HEIs

1. **Collaboration within an Academic Institution**: Partnerships among departments and faculties within the same institution.
2. **Collaboration with other Academic Institutions**: Cooperative research efforts with other universities and colleges.
3. **Collaboration with Government Agencies**: Joint research projects with governmental bodies and agencies.
4. **Collaboration with Industries**: Partnerships with businesses and industries to apply academic research to practical problems.
5. **Collaboration with International Researchers/Institutions**: Global collaborations that bring together researchers from different countries.

The collaboration process typically involves several stages:

- **Submission of Proposals**: Developing and submitting detailed research proposals to potential collaborators or funding bodies.
- **Review and Evaluation**: Proposals are reviewed and evaluated for their feasibility, potential impact, and alignment with strategic goals.
- **Assessment (Risk/Finances)**: Assessing the risks and financial aspects associated with the research collaboration.
- **Execution**: Implementing the research project according to the agreed-upon plan.
- **Close-out**: Completing the project, including the finalization of reports and administrative tasks.
- **Publication**: Disseminating the research findings through academic journals, conferences, and other appropriate channels.

Figure 9: A glance into the stages of the research collaboration process

Challenges and misconceptions regarding research collaborations

There are several misconceptions at the collegiate level regarding research collaboration in India that can hinder effective partnerships and the advancement of research. One of the biggest misconceptions is that only large, well-funded institutions can engage in meaningful collaborations. Whereas, contrarily, smaller institutions can also participate and benefit significantly from collaborations, often bringing forth unique strengths and perspectives, also benefiting smaller institutions in terms of community engagement, policy influence, and commercial opportunities. Rather than not engaging in research collaborations due to the fear of

failure, what is required for colleges is to understand that collaborative projects require time, to develop mutual trust, align objectives, and produce meaningful outcomes. There is often an expectation that collaborations should yield immediate results. However, patience is key. As highlighted above, the multi-stage process of collaboration requires continuous engagement, relationship-building, and management. It is only then that effective collaborations can yield benefits from the shared expertise, with all involved parties retaining their research independence.

Success Story: International Collaborations by R.B.V.R.R Women's College, Hyderabad

Hanoi National University of Education, Vietnam

National Research Institute for Agriculture, Food and the Environment, France

Universiti Teknologi MARA, Malaysia

Maranatha Christian University, Indonesia

University of NewCastle, Australia

Sunway University, Malaysia

Dr. J. Achyutha Devi, Principal of R.B.V.R.R. Women's College, Hyderabad, focuses her research on developing pesticide formulations using bioactive molecules derived from natural products. Her collaborative research team includes Dr. Rama Devi Patel from the University of Hail, Saudi Arabia,

and Prof. R. Thangapandian and Dr. C. Vijayaraghavan from the Cotton Research Station in Srivilliputtur, Tamil Nadu.

A glance into the research collaboration and execution experience of R.B.V.R.R. Women's College

1. **Initiating Collaboration**:

    - Dr. Devi initiated the collaboration by reaching out to researchers from Saudi Arabia and the Cotton Research Station. Despite initial challenges, all parties agreed to collaborate.
    - They formalized their partnership through a signed collaboration document.

2. **Research Activities**:

    - Dr. Devi managed the experimental work at R.B.V.R.R. Women's College, where natural products were isolated and characterized, and the insecticidal potential was evaluated.
    - Samples were then sent to Saudi Arabia for cytotoxicity and enzyme assays, and to Tamil Nadu for field studies of the developed formulations.
    - The collaboration resulted in the development of a suitable formulation to combat major insect pests within a 12-month period.

Overcoming Challenges and Achievements

- **Presentation and Recognition**:

    - Dr. Devi was invited to speak at The First International Conference on Medicinal Plants and Natural Products (MPNP2024) in Vietnam. As a woman and administrator, she faced challenges in securing travel support.
    - With the support of R.B.V.R.R. Women's College, she attended the conference, which led to the establishment of seven international research collaborations.

- **International Collaborations**:

    - The new collaborations include prestigious institutions such as:

        - Hanoi National University of Education, Vietnam
        - National Research Institute for Agriculture, Food and the Environment, France

- Universiti Teknologi MARA, Malaysia
- Maranatha Christian University, Indonesia
- University of Newcastle, Australia
- Sunway University, Malaysia
- University of Sri Jayawardenepura, Sri Lanka

- **Research Outcomes**:

  - These collaborations have led to active research in areas such as insect biology, natural products, and diabetes.
  - The institution has published four research papers indexed by SCOPUS, with two more in the process of communication.

Dr Devi's experience underscores the importance of research collaborations in enhancing institutional capabilities and recognition. It also highlights the need for HEIs to support faculty in establishing and sustaining these collaborations. Such support can lead to significant advancements in research and development activities, ultimately benefiting the institutions and the broader scientific community. Therefore, there is a need for faculty of all HEIs to establish collaborations and the managements to further support them for the promotion of research and development activities.

Conclusion

Research is an integral component of higher education globally, with a far-reaching impact on knowledge, innovation, society, and the economy. It plays a vital role in addressing the current and future challenges on a global scale while enriching the educational experience for students and expanding the boundaries of human understanding. This is a time of renewed enthusiasm for higher education and research as the way forward to development with sustainability. Human and social development is possible through higher education and improved research capabilities in an era of globalization. Community based research, research collaborations, alongside planned strategies for gradual improvement of research productivity can play a major role in enhancing the quality and relevance of the research output. These measures may help enhance research culture and output in Telangana's higher education landscape, driving innovation and contributing to the state's development and sustainability.

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A presentation on 'Extension activities: Knowledge for the benefit of society NAAC Criterion 3 &7', by Dr. Anil Dusane, S.P. College, Pune

Intellectual Property Report of 2021-22
https://assets.publishing.service.gov.uk/media/5a7cbbffe5274a2f304efc16/universal-ethical-code-scientists.pdf

Dusane, Anil, (2020). Extension activities: Knowledge for the benefit of society, NAAC Criterion 3 &7, accessed on 10.06.2024

Commissionerate of Collegiate Education (CCE) website https://ccets.cgg.gov.in/

Telangana Council of Higher Education Website https://www.tsche.website/

Case Studies provided by **Dr. G. Suhasini, Asst. Professor, Head, Department of Zoology, Pingle Government College for Women and Ch.Pranitha, Pingle Government College for Women.**

APPENDIX

Indian Research Funding Agencies

https://igod.gov.in/
A one-point source to know all about Indian government websites at all levels and from all sectors
https://dst.gov.in/
Department of Science and Technology, Govt. of India
https://moef.gov.in/moef/about-the-ministry/schemes-and-programmes/index.html
Funding schemes of Ministry of Environment and Forests, Govt. of India
https://icar.org.in/
Indian Council of Agricultural Research
https://www.icssr.org/
Indian Council for Social Science Research
https://www.ugc.gov.in/
University Grants Commission
https://fellowships.gov.in/
Common Fellowship Portal | Ministry of Science and Technology

International Research Funding Agencies

http://es.epa.gov/ncer
National Center for Environmental Research - Grant proposal site
http://sarn.ssrc.org/centers/western.shtml
South Asian Research Network for Social Sciences and Humanities
http://tram.east.asu.edu/fund/agency.html
Texas Research Administrators Group (TRAM) – Funding agency home pages
https://www.darpa.mil
Defence Advance Research Project Agency (DARPA)
https://www.cs.virginia.edu/~robins/sponsors.html
Research sponsors for all fields of Science and Technology – Govt. agencies, foundations and association, WWW links and searchable database
https://www.epa.gov/research-grants/research-funding-opportunities
U.S. Environmental Protection Agency - Grants and fellowship information
www.esf.org
European Science Foundation. Funding for all subjects
https://www.fordfoundation.org/
Ford Foundation
https://fundsnetservices.com/grants/canada
Research Organisations
https://www.ahrq.gov/funding/grant-mgmt/grants-by-state.html
Grants Online database
www.grants.gov
Single access point for over 900 grant programs offered by the 26 federal grant-making agencies
https://www.iie.org/programs/fulbright-program-for-non-us-students/
Fulbright Foreign Student Program
https://www.indiastudies.org/research-fellowship-programs/
Fellowship programs
https://www.informs.org
Opportunity for research funding in Operations Research/Management Studies

https://www.ord.msstate.edu/finding-funding
Research funding agencies in US – List with URLs
https://www.hhs.gov/grants-contracts/index.html
U.S. Dept. of Health and Human Services – Grants and funding
https://www.sshrc-crsh.gc.ca/home-accueil-eng.aspx
Social Science and Humanities Council of Canada (SSHRC)
https://euraxess.ec.europa.eu/funding/search
The largest database of job, funding and hosting offers in Europe
https://erc.europa.eu/funding-and-grants
European Research Council
https://marie-sklodowska-curie-actions.ec.europa.eu/
Marie Curie Actions - Funded projects
https://www.developmentaid.org/grants
Information service provider for international development aid and economic and humanitarian assistance stakeholders

Proposal Writing

https://www.library.wisc.edu/memorial/collections/grants-information-collection/
Grants information collection – Proposal writing : Internet resources
Non-governmental, Research, Federal and other sites
https://research.unc.edu/researchers/proposal-development/
Proposal Development Guidance by the University of North Carolina
https://writing.colostate.edu/guides/index.cfm?category=4&subcategory=0
Writing guides – Quantitative and qualitative research
https://writingcenter.unc.edu/tips-and-tools/grant-proposals-or-give-me-the-money/
Funding and proposal writing handout
www.istl.org/05-spring/article3.html
Global access to Indian research (article)
www.learnerassociates.net/proposal
Guide for writing a proposal
http://www.learnerassociates.net/proposal/links.htm
List of proposal writing manuals, guides, writing workshops, bibliographies of books, resources on proposal writing and writing aids
https://researchswinger.org/others/simon-proposal.pdf
Writing a good grant proposal
https://www.umass.edu/research/proposal-preparation-guide
Proposal Preparation Guide

Fostering a culture of Innovation in Higher Education Institutions

Surbhi Kak[9], Dr. P. Jhansi Rani[10]

Introduction

Innovation can be simply defined as the process of transforming ideas into new or improved products, processes, and services. It plays a crucial role in bringing inventions to the market by translating scientific knowledge into tangible economic and societal benefits. Higher education institutions (HEIs) are pivotal in nurturing the innovation ecosystem, where young minds contribute significantly to shaping future innovations.

Recognizing the pivotal role of Research and Innovation in HEIs, the Ministry of Education (MoE), Government of India has established the 'MoE's Innovation Cell (MIC)' with a mandate to systematically cultivate a culture of innovation across all HEIs in the country. MIC is tasked with promoting various innovation initiatives such as ranking institutions based on their innovation achievements, organizing events like the 'Smart India Hackathon', conducting Idea Competitions, and collaborating closely with central and state agencies to develop policies that support and enhance the innovation ecosystem in India. MIC's efforts are focused on creating a complete innovation ecosystem in educational institutions, spanning from idea generation to pre-incubation, incubation, and the successful graduation of startups. It also aims to develop a ranking system to identify institutions leading in innovation.

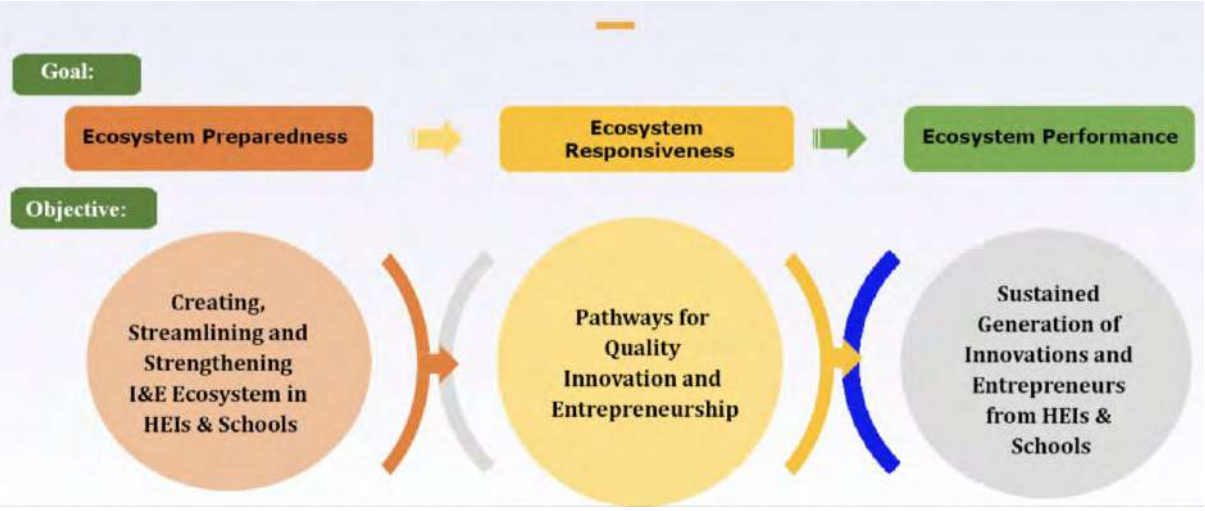

Figure:1 Policy Approach & Action Plan for I&E Development in HEIs (Source: MIC website)

Research and innovation are critical for universities and colleges to establish a strong national and global presence. Aligned with the requirements of the National Education Policy (NEP) 2020, even undergraduate colleges are mandated to engage in research, emphasizing community-oriented and socially relevant initiatives in alignment with the Sustainable Development Goals (SDGs). Ideally, all HEIs should cultivate comprehensive ecosystems that

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[10] Prof. P. Jhansi Rani, Asst. Prof in Chemistry, Innovation Ambassador, R.B.V.R.R Women's College, Hyderabad

foster innovation and research, inspiring students with new ideas and processes during their formative years.

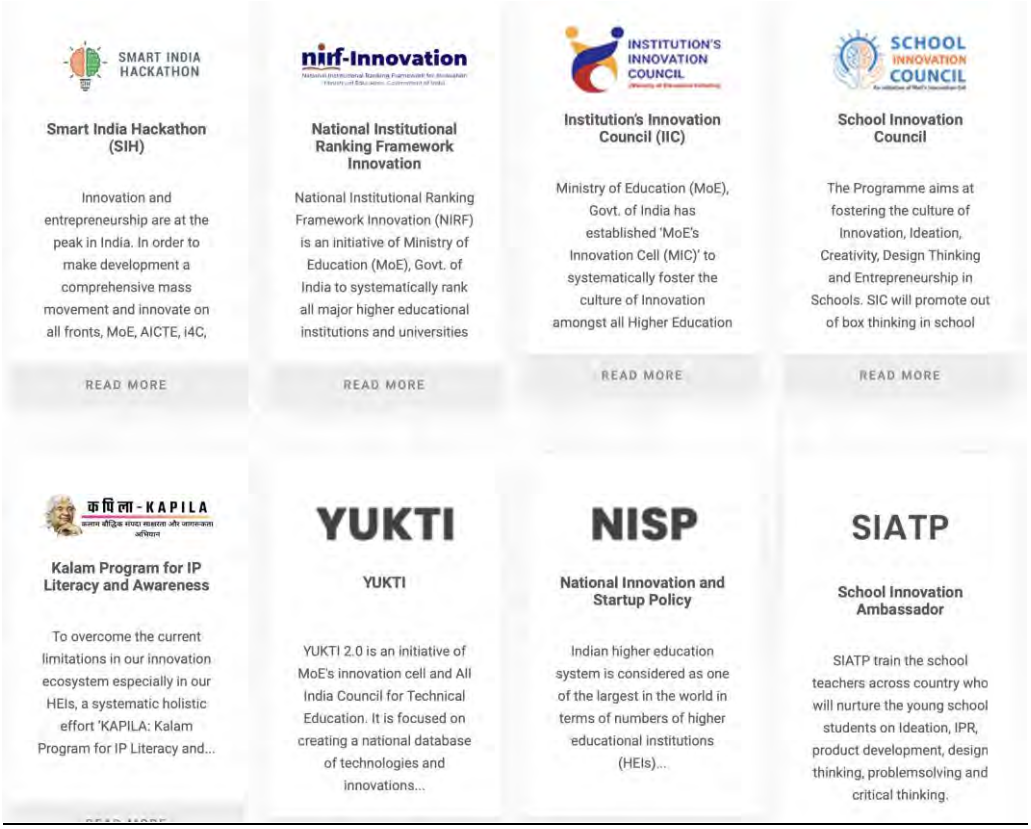


Figure: 2 A glance at the resources and initiatives offered by the Ministry of Education's Innovation Cell (Source: MIC website)

Figure 3: The various ways in which MIC supports the facilitation of innovation culture within institutions (Source: MIC website)

Figure 3 highlights several initiatives designed by MIC to foster innovation and entrepreneurship within higher education institutions (HEIs).

1. Innovation Ambassador Program

Objective: To build in-house human resource capacity that can effectively engage, manage, and generate innovation and entrepreneurship (I&E) activities.

Key Features:

- **Training and Mentoring**: The program focuses on providing comprehensive training and mentoring support to both students and faculty members. This includes workshops, seminars, and hands-on sessions to enhance their skills and knowledge in the innovation domain.
- **Capacity Building**: By empowering individuals within the institution, the program aims to create a sustainable ecosystem that continuously promotes and nurtures innovation and entrepreneurship.

2. Impact Lecture Session

Objective: To provide funding support to HEIs that are geographically distant from established I&E ecosystems, enabling them to organize impactful lectures.

Key Features:

- **Funding Support**: Financial assistance is provided to these institutions to facilitate the organization of lectures by experts in the field of innovation and entrepreneurship.
- **Performance Improvement**: The sessions are designed to improve the overall performance of the institutions by exposing students and faculty to cutting-edge ideas, best practices, and successful case studies in innovation.

3. Innovation Contest

Objective: To offer a 360-degree experiential learning program for students who are potential innovators and entrepreneurs.

Key Features:

- **Experiential Learning**: The program provides hands-on learning opportunities through contests that challenge students to develop innovative solutions to real-world problems.
- **Student Innovators and Entrepreneurs**: It targets students with a high potential for innovation, encouraging them to apply their theoretical knowledge to practical scenarios and develop entrepreneurial skills.

4. Mentor-Mentee Program

Objective: To support peer group mentoring with funding assistance aimed at improving institutes and fostering inter-institutional collaborations.

Key Features:

- **Peer Group Mentoring**: Experienced mentors provide guidance and support to mentees, helping them navigate the challenges of innovation and entrepreneurship.
- **Funding Support**: Financial aid is available to facilitate these mentoring activities and encourage collaborative efforts between different institutions to enhance their innovation capabilities.

5. Yukti National Innovation Repository

Objective: To create a comprehensive repository of ideas, innovations, and start-ups, aiding their journey from campus to commercialization.

Key Features:

- **Building Repository**: The system collects and organizes a wide array of innovative ideas and entrepreneurial ventures from various institutions.
- **Campus to Commercialization**: It supports the transition of innovative concepts from the academic environment to the commercial market, providing necessary resources, connections, and guidance to ensure successful commercialization.

Institutional Innovation Councils (IICs)

MIC facilitated the formulation of Institutional Innovation Councils (IICs) within educational institutions in India with the objective of developing a culture of innovation, entrepreneurship, and startup development among students and faculty.

Key features of IICs include:

1. IICs encourage and support students and faculty to innovate and develop new ideas, products, or services that can contribute to societal and economic development.
2. They provide guidance and resources for aspiring entrepreneurs within the institution, facilitating the process of startup creation from ideation to incubation and beyond.
3. IICs organize workshops, seminars, hackathons, and idea competitions to nurture innovative thinking and entrepreneurship skills among students.
4. They establish links between academia, industry, research institutions, and government agencies to facilitate collaboration and knowledge exchange.

5. IICs may also advocate for policies that support innovation and entrepreneurship at the institutional and governmental levels.
6. They assess and recognize innovative projects and initiatives within the institution, promoting a competitive spirit and rewarding excellence in innovation.
7. IICs strive to ensure that innovative ideas and startups are sustainable and scalable, contributing to long-term impact and growth.
8. No major capital investment required. IIC program makes use of Institute's existing infrastructure to foster the culture of I&E ecosystem in the campus
9. Exclusive FDP & SDP program for IICs like Innovation Ambassador Training Program, Mentoring Sessions, Leadership Talks and IIC Online Sessions.

As per MIC, any institution wanting to establish an IIC must meet any one of the following criteria:

- Having pre-incubation centres/incubation centres, student idea clubs.
- Participated in Atal Ranking Institutions Innovation Achievements Policy ARIIA Ranking.
- Participated in National Institutional Ranking Framework Ranking.
- National Board of Accreditation/National Assessment and Accreditation Framework.
- Recipient of Technical Education Quality Improvement Programme TEQIP –III fund & establishment of Start-up Cell.
- Government/ Government funded/Deemed University.
- HEIs offering non-technical programs can also establish IIC.

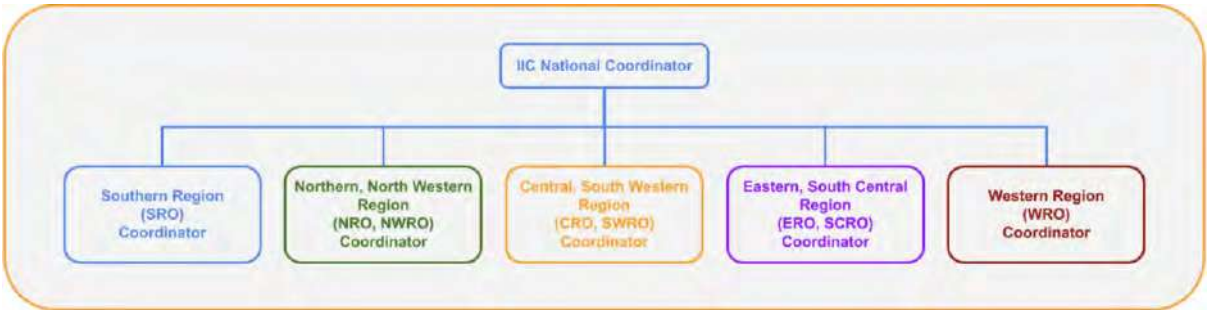


Figure 4: National level structuring of Institutional Innovation Councils by MIC

Registering your IIC

(Source: MIC Website, For further details: https://iic.mic.gov.in/assets/html/Introduction.html)

The MIC portal offers a comprehensive and well-explained step-by-step process of registering your IIC, the steps to be undertaken post registration, and how to manage your

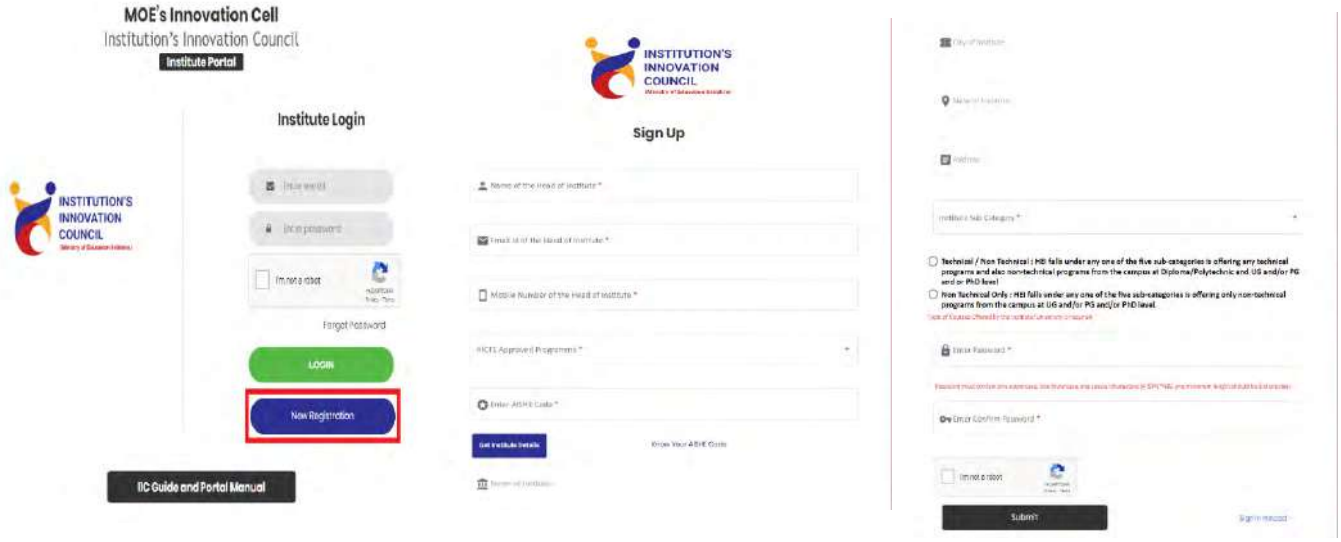
dashboard post registration. The information and graphics incorporated below have also been acquired from the portal.

Registration Process

Step 1

Go to website: "https://iic.mic.gov.in/login"

Then press"For New Registration". You will get the registration form.



Step 2

Now fill the required details like Head of the Institute's Name, mail-id and mobile number in their respective fields.

Step 3

For "AICTE approved program" you must choose the option "Yes" / "No".

Choose "Yes" if your institute is offering AICTE approved program. After choosing "Yes" one new field will show asking for "Institute Permanent ID ". In that field enter your AICTE permanent ID.

Step 4

Now you have to enter your AISHE code.

Then press "Get Institute Details". if the AISHE code is correct then the details of your institute will be shown in the respective fields. If the details shown are wrong, then you might have entered incorrect AISE code.

If you don't know your AISHE code, press "Know Your AISHE Code" in that form. Or directly go to "https://aishe.gov.in/aishe/aisheCode".

In that page you can find your institutes AISHE code from the given search / filter options.

Step 5

Now choose your institute type under "Institute Sub-Category".

Then choose "Type of Courses Offered by the Institute/University".

Step 6

Now enter the password for your login.

And re-enter the password to confirm your password.

Password must contain one uppercase, one lowercase,one special characters(@!$#%*%&) and minimum length should be 8 characters

Step 7

Then complete the CAPTCHA process and press "Submit" button.

You will receive a "Registered Successfully" message.

If you are receiving any error refer the "Error Solution Document"

Post successful registration, the following steps will have to be undertaken as per the MIC portal.

1. **Mail Verification**

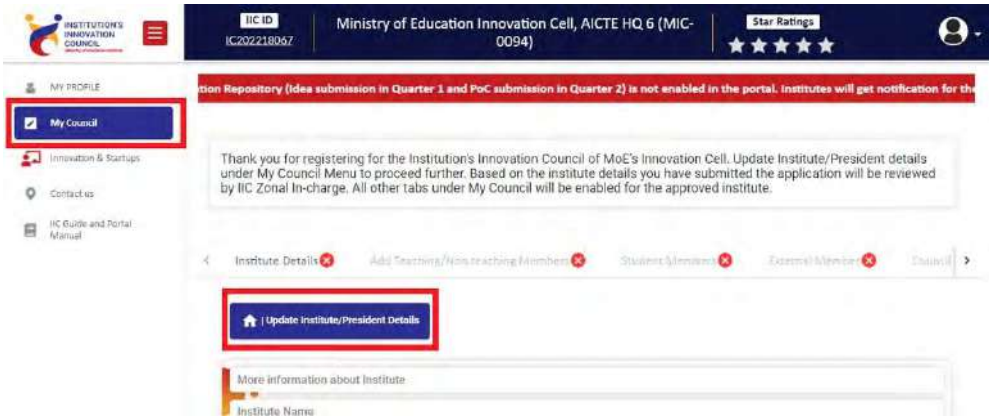
- After successful registration you will receive an email to the registered email id.
- In that mail there will be

    1. Verification link
    2. Login Credentials
    3. Your zonal coordinator contacts information

- After pressing that verification link you will get a "Verification success" message.
- Now you can login with to the IIC portal from "https://iic.mic.gov.in/login" with your login credentials which you have received in the email.

2. **Update Institute / President details**

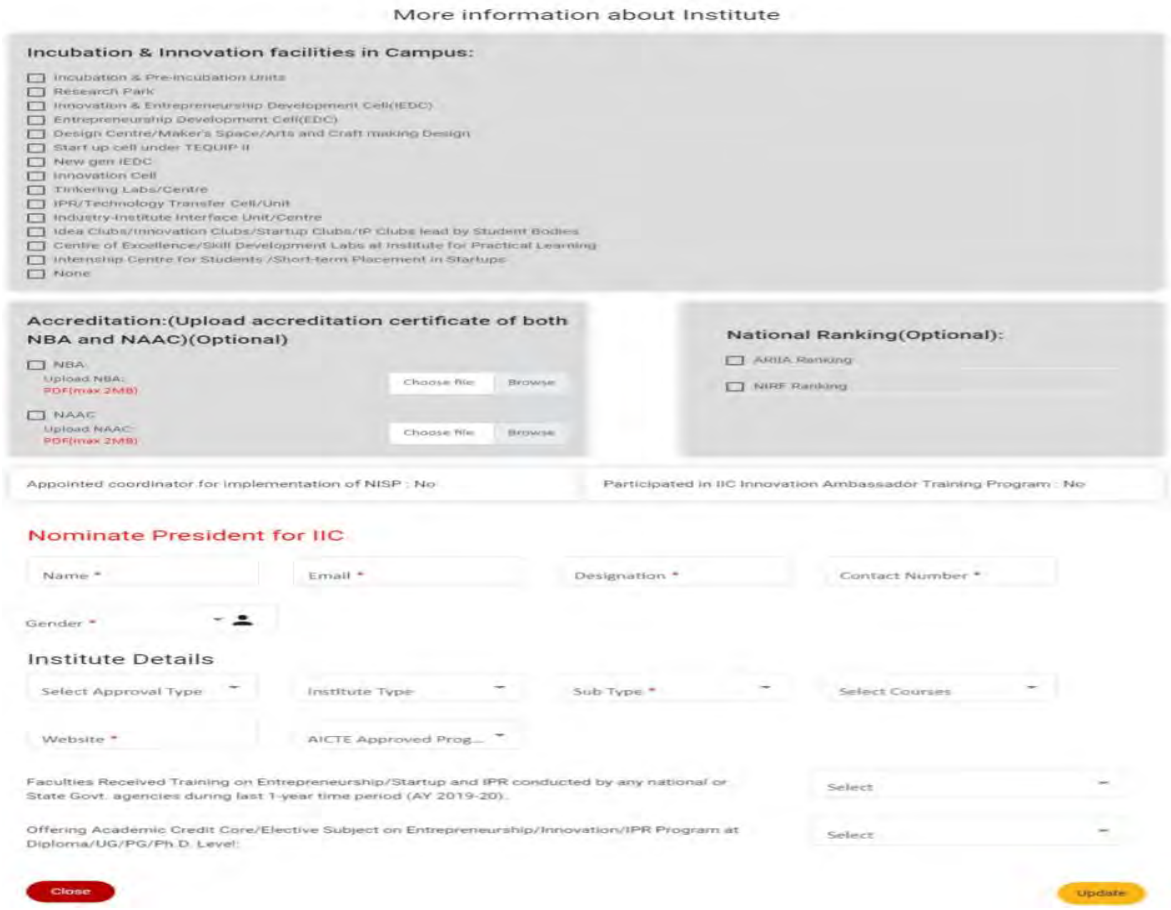
1. After your login you will be in the My council page

    a. 

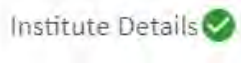
2. Now press "Update Institute / President Details" under the "My Council" Menu.

3. You will be presented with a form to fill.
4. Form will require the following details:
    a. Incubation & Innovation facilities in Campus
    b. Accreditation (Upload accreditation certificate of both NBA and NAAC) (Optional) - If you have accreditation you have to upload the document
    c. National Ranking (Optional) - If you have ave to mention the ranking
    d. Nominate President for IIC
        i. Name
        ii. Mail
        iii. Contact
        iv. Designation
        v. Gender
5. Institute Details
    a. Approval type
    b. Institute Type
    c. Sub Type
    d. Course offered
    e. Institute website address
    f. AICTE approved program. If yes you are required to enter the Institute permanent ID.

***Note : IIC Head of Institute can also be the IIC president**



- After completing all the above-mentioned details press "Update" button.
- You will receive a success message.
- After successful completion of the "Update Institute / President Details" the indication will turn from "red cross" 

to "green tick" mark 

. This is an indication for the successful update of that step.
- If you receive any error, refer the "Error Solution" document.

Now you must wait for the zonal coordinator to approve your institute, after their approval you have to update some more details/steps.

1. **After approval you can download the establishment certificate from "My Profile -> Certificates" refer that page to find how to download the certificate**
2. **Refer "My Council" for next step.**

In case you do not see these tabs contact your Zonal Co-ordinator.

Logging In to your IIC Portal

To login to your IIC Institute portal go to "https://iic.mic.gov.in/login". After your login you will be at your Institute's Dashboard of your current academic year activity. To know what is present refer the "Dashboard - Current Academic year activity" document.

Basic sections of IIC portal

1. Menu collapse Button
2. Menu list
3. IIC ID / Institute Dashboard
4. Institute Name
5. Institute's current star rating
6. Profile / Logout
7. Footer / Contact Us / Quick Links / Social Media Links
8. Dashboard - Current academic year

As encapsulated in the sections above, while the MIC has made significant strides to set up systems for fostering innovation amongst the HEIs of India, there are still several gaps that need to be filled, and challenges that need to be tackled.

Gaps in the Current Innovation Ecosystem

While programs like the Innovation Ambassador Program and the Mentor-Mentee Program are vital, there is a need to integrate more interdisciplinary approaches that encourage collaboration across different fields of study. This could enhance the development of innovative solutions that are not only technically sound but also socially and environmentally relevant. Moreover, the current initiatives tend to focus heavily on institutions that already have some level of engagement with innovation activities, primarily engineering institutions. There is a pressing need to extend these efforts to reach a broader range of HEIs, especially those in remote and underserved regions.

Moreover, while the Yukti National Innovation Repository aims to bridge this gap between academia and industry, more focused efforts on creating platforms for direct interaction, collaborative research projects, and industrial internships can significantly boost the practical applicability of academic innovations. Facilitating more programs on enhancing IPR education and providing dedicated support for patent filing and commercialization processes can protect innovations and incentivize further research and development activities.

A peak into the Innovation ecosystem of Telangana

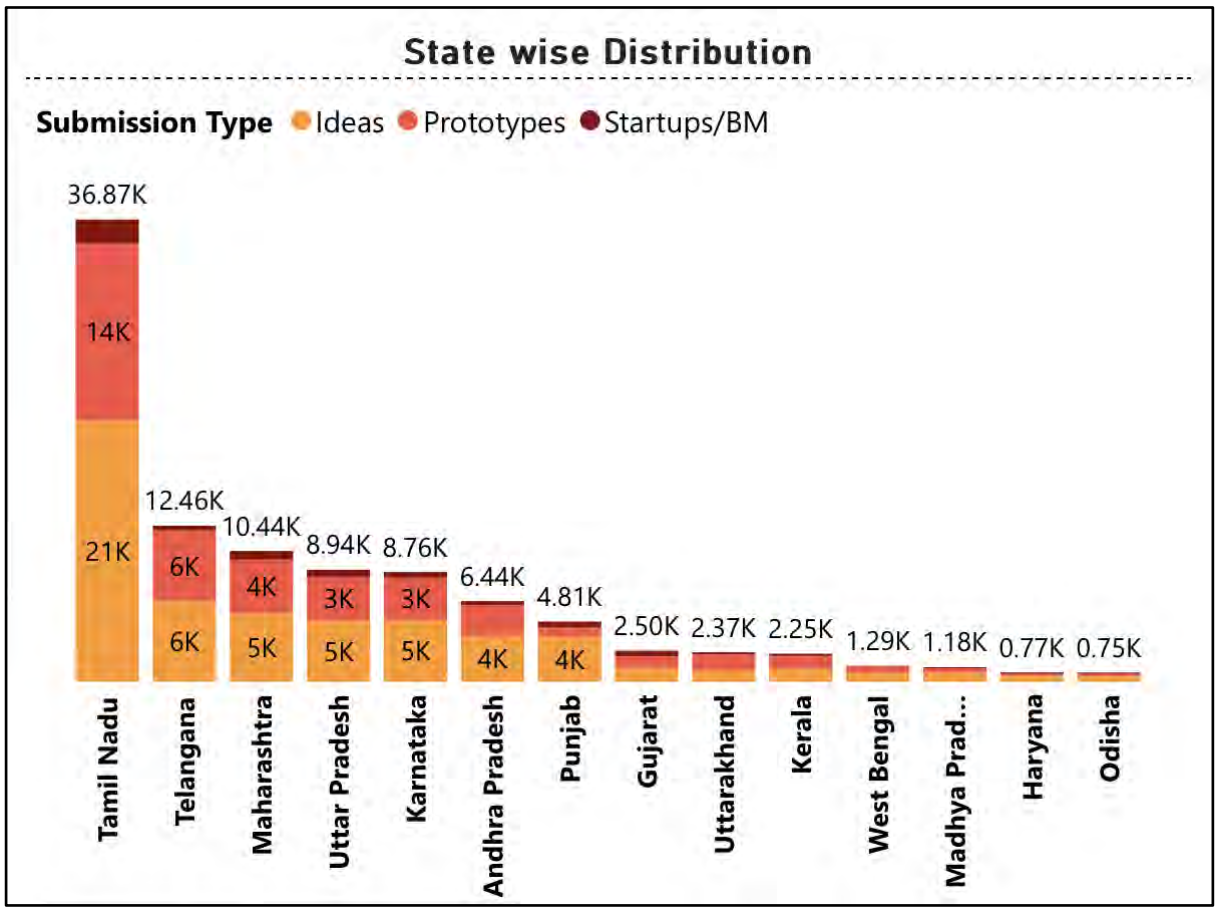


Figure 6: State wise distribution of ideas, prototypes, and startups (Source: MIC Website)

As evident in the figure 6, Telangana is at second place in terms of submission of ideas, prototypes, and startups to the various initiatives of MIC. Though, a great achievement, in parallel, the state currently hosts only 336 IICs, out of which 74 are active, 46 moderately active, and 206 inactive. Notably, only 35 Government Degree Colleges have established IICs, with many currently inactive. Thus, there is a need to assess the reasons for IICs' inactivity and strategize to enhance their participation in fostering innovation across the state. Moreover, active efforts need to be made to increase the establishment of IICs within the colleges.

Challenges towards fostering Innovation

1. There is often a lack of awareness among faculty and students about the role and potential of IICs in promoting innovation. Proper training and orientation programs are essential but are lacking.
2. Many IICs are not actively engaged in promoting innovation within their institutions. This could be due to a lack of dedicated resources, leadership, or strategic direction.
3. Insufficient funding, infrastructure, and support systems pose significant hurdles for IICs to effectively foster innovation among students and faculty.

4. Many IICs struggle with sustaining innovation initiatives beyond initial enthusiasm or funding periods. There is a need for long-term planning and support mechanisms.
5. Limited collaboration between IICs, industries, research institutions, and other stakeholders can restrict the exchange of ideas, resources, and best practices.
6. While initiatives like the MIC provide a framework, there may be inconsistencies or gaps in policy support at the state and institutional levels.
7. Successfully scaling up innovative ideas from pilot stages to broader implementation remains a challenge for many IICs, especially in diverse and complex educational settings.

Addressing these challenges requires concerted efforts from educational institutions, government bodies, industry partners, and other stakeholders to create an enabling environment for innovation to thrive. It involves strategic planning, resource mobilization, capacity building, and fostering a culture that values and rewards innovation across all levels of the education system.

This might appear daunting to many institutions; however, exemplar case of R.B.V.R.R. Women's College will reflect that if there is a will to innovate, the means, and sources are also a step away

A Report on Innovation & Entrepreneurship Activities Of R.B.V.R.R Women's College, by DR. P. JHANSI LAKSHMI, Asst. Prof, Department of Chemistry, Innovation Ambassador

Research and innovation in higher education institutes serve several interconnected objectives that contribute to their mission of advancing knowledge, fostering societal development, and enhancing global competitiveness. R.B.V.R.R Women's College a research-active institute enrich the educational experience by integrating cutting-edge research into curriculum development and teaching practices. Engaging students in research projects enhances critical thinking, problem-solving skills, and prepares them for careers in academia, industry, and public service. The College strives for excellence in specific disciplines by conducting high-impact research, publishing in prestigious journals, securing competitive grants, and earning recognition for research achievements. This enhances the institute's reputation and ranking within academic and research communities.

R.B.V.R.R Women's College adapted the following initiatives as best practices for enhancing research, innovation & Entrepreneurship culture among faculty and students for quality enrichment.

Institute Innovation Council (IIC) - RBVRR Women's College has established Institution's Innovation Council (IIC) as per the guidelines of 'MoE's Innovation Cell (MIC)' in the year 2020. The initiative was to promote innovation, start-ups and encourage entrepreneurship in the institution through various modes leading to ecosystem in campus. Institution is actively involved in organizing and conducting activities related to Innovation, Start-up, entrepreneurship and IPR, Idea competitions etc. for its students and faculties. Under Institute

IIC faculty are trained as Innovation Ambassadors who are responsible for fostering and facilitating innovation & Entrepreneurship ecosystem as resource persons for conducting seminars and workshops, hackathons, idea competitions, in the institute. MIC will grade the institute performance based on innovation activities taken up in the institute every year. **The college has secured 3.5-star rating for the academic year 2020-2021,4 stars for 2021-22 and 3.5 stars during 2022-23.**

RBVRR-CIIRD preincubation centre provided facilities for Prototype development for TECH REDI team. The team had developed proof of concept and had built the prototype for further testing stage. The team had participated in bootcamps and hackathons , organised at state and National Level. The team had won Best Innovator Award for Telangana Intinta Innovator programme 2023, at Hyderabad district level organised by Telangana State Innovation Cell **.**

Details about the product prototype

Hardware Prototype – with Trade Name-Tech Redi

Team Details: -

Students: - 1. Mrudulla. B B.Sc. Bt. CFs. (2020-2023Batch)

2. Tejaswini B.Sc. Bt. CFs. (2020-2023Batch)

3. Pragnya B.Sc. Bt. CFs. (2020-2023Batch)

4. Sunidhi B.Sc. Bt. CFs. (2020-2023Batch)

Mentor Details: - 1. Dr. P. Jhansi Lakshmi, Assistant Professor, Dept. of Chemistry

2. Manoj Kumar Badagharwala, Product Development Mentor

The team was also selected for a funding support of 8 Lakhs under Yukthi Challenge 2023 from MIC/AICTE.

The TECH REDI team had applied for below two patents-Trademark Patent **and** Design Patent

TechRedi Team with Mentor Dr. P. Jhansi Lakshmi along with students Tejaswi, Mrudulla, Pragnya participated in an event " The greatest Show& Tell In India -Maker Faire Hyderabad" organised by TSIC, at one of the largest Incubation centre T-WORKS during 16th-17th December 2023

INTINTA INNOVATOR (TSIC) - 2023 -The team won best Innovator award at Hyderabad District level in **Telangana Intinta Innovator program** Organised by Telangana state Innovation Council. Participated in Exhibition and showcased the prototype at Hyderabad District Collector Office on August 15th Independence Day Celebrations**.**

TechRedi team with Hyderabad District Collector on August 15 2023

The team participated in Smart India hackathon 2022 organised by Ministry of Innovation Cell and AICTE. Hardware Edition Grand Finale held from August 25th-29th at Kalasalingam Academy of Research and Education, Sirivilliputhur for Problem statement MA 1219 under NIFTEM Thanjavur, Ministry of Food Processing Industries (MoFPI)

SIH-2022 Hardware Edition Winners- 1 lakh Prize Money

National Institute of Startup Policy (NISP) - RBVRRWC NISP Policy was framed in 2021, College Innovation and Startup Policy for students and faculty will enable the institute to actively engage students, faculty in innovation and entrepreneurship related activities. This framework will also facilitate the college in terms of Intellectual Property ownership management, technology licensing, equity sharing, thus enabling creation of a robust innovation and Star- up ecosystem

RVRRWC - Research Policy- The main objectives this policy includes 1. providing policy guidelines and direction for the growth and Development of research activities., 2. to advice on thrust areas and disciplines for introducing research programs and related activities for future development in research 3. to suggest measures for improving existing infrastructure facilities both for academic and sponsored research and enhancing research ambiance. 4. To recommend projects and suitable for availing concession if any from state and central govts. 5. To promote research by extending financial assistance to the faculty members of the college. 6. To promote collaborative research activities with National & International Universities/Research Institution/Industries

Atal Ranking of Institutions on Innovation Achievements (ARIIA) Ranking- : College has registered for ARIIA, It is an innovative initiative the Ministry of Education, Government of India introduced. ARIIA is implemented by the All-India Council for Technical Education (AICTE) and the Ministry of Education's Innovation Cell. ARIIA aims to rank the major higher education institutions across India. It will focus on the quality of innovation and its real impact nationally and internationally. It will give direction to institutes for future development. It will make them globally competitive in innovation and entrepreneurship.

NIRF Ranking- The National Institutional Ranking Framework (NIRF) acts as a guiding light, aiding students, educators, and policymakers in evaluating and selecting institutions. This comprehensive framework provides a detailed assessment of various parameters, offering a transparent ranking system across diverse educational domains. RBVRR Women's College participated in NIRF Innovation ranking for the academic year 2022-23, where the college secured the rank within the and 150-200.

UBA Flagship Program- The college registered as Participating Institute under Unnat Bharat Abhiyan Program during 2021-22. Adopted 5 Villages under Yadadri District. Under this flagship program the college organizes several rural community / Institute Social Responsibility/ extension /Outreach programs on sustainability, health & Hygiene, Women Empowerment and Clean & Green activities.

- The college received seed money of Rs 50,000/- during 2021-22, Seed money is utilized for Assistance for Gram Panchayat Development Plan study, need Assessment and Contingency Expenditure.

- The college was sanctioned for **two** projects of **1 Lakh worth each** under Capacity Building Program 1**. Beekeeping for Rural Entrepreneurship 2. Cow dung-based product making machine implementation in adopted villages.**

RBVRR CIIRD- Centre for Innovation Incubation Research Development

RBVRR CIIRD aims to encourage and promote innovation culture among students by providing support and training for students and innovators who are interested in converting their social ideas into social startup. The Centre facilitates necessary infrastructure, prototype development support, research assistance, consultancy for product testing and evaluation to make their idea into a successful venture.

RBVRR CIIRD provides mentoring Support in areas such as technology development, ideation, creativity, design making and financial management to the students and faculty. The Centre provides suitable startup ecosystem, by establishing a network between institute and industries, incubation centers ,financial institutions, government funding agencies ,angel investors and venture capitalists. The Centre provides required services and facilities Legal, IPR, Funding and Market access to facilitate and nurture student innovators to become sustainable startups.

Conclusion

The MIC's initiatives and programs, have laid the foundation for building a robust innovation ecosystem. However, the institutional management plays a critical role in implementing these initiatives by fostering a supportive environment and investing in necessary infrastructure. Moreover, state governments must also provide the necessary support to ensure these programs reach remote and underserved regions, promoting equitable access. While gaps and challenges persist, the ultimate beneficiaries of this entire initiative our students who gain practical skills, exposure to new technologies, and access to opportunities for real-world problem-solving, enhancing their employability and potential as future innovators. The future is promising, with the potential to create a dynamic innovation ecosystem.

Resurgence of Indian Undergraduate Education: Outcomes Based Approach

Prof.P. Bala Bhaskar[11], Dr.J.Neeraja[12] and Dr. K. Rama [13]

Introduction

India is experiencing a considerable increase in the share of young adults (21-26 years age group) continuing tertiary education. While the demand for engineering education in computer related specialisations has been on the higher side we also observe a shift of preference from Sciences to Social sciences (37% enrolment) especially at bachelor's level (AISHE 2021- 22, OECD 2017).

With around 30 colleges per lakh population having an average enrolment of 709 students per college (AISHE 2021-22) we are yet to reach the targeted GER of 50. issues of quantity /access/quality are still a challenge. By 2025, with the average Indian expected to be of 27 years age, 65% of Indian population will be in the working age group. With the Gross Enrolment Ratio (GER) at 28.4% issues of access, equity and quality of education are still a challenge. While the total annual academic output of qualified UG & PG students across all streams of education is in the 94 to 96 Lakh range and less than 15 % of them opting for Ph.D and other higher education options we have a soaring 75-80 lakh looking for employment. Percentage of enrolment at various levels (78.9% UG, 12.1% PG, 0.44% Ph.D, 7.39% Diploma) (AISHE 2021-22) clearly reflect that large number of our youth prefer to progress to employment immediately after their first degree. Unfortunately surveys reveal that almost 90% of graduating from our colleges are not equipped with the skills required by the job-markets. The focus on formal learning created skill deficit, (only 5% formally skilled), leaving graduates unprepared for the competitive job market. Further keeping the student preferences in view, it is high time we reform our undergraduate (UG) education especially those programs in liberal arts, social sciences and humanities.

India, with over 808 million youth below 35, faces a critical reflection on potential versus realisation, ambition versus support, and the correlation between employment and employability. In such a context the shift towards holistic skill-based education, as outlined in NEP 2020, becomes imperative for success.

In the technology-driven competitive era, higher education institutions are mainly driven by a commitment to excellence, relevance, and inclusiveness. Thus, if the nation has to harness

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[13] Dr. K. Rama, Telangana State Lead, CRISP

on this human capital potential, our early college education system should be reformed to provide the required skills and knowledge aiding their personal growth thereby transforming them into economically independent and globally relevant workforce. Some of the major initiatives of the present Government such as "Make in India", "Skill India" "Start up India" "Viksit Bharat" are aimed at empowering the youth of India by providing them with the required skills and training. These initiatives will contribute to the Nations social and economic development, provided the education sector captures and integrates the components of these initiatives in the reform agendas. In the past UGC had attempted several initiatives and provided support in offering industry related programs, provisioned for add-on courses, socially relevant certificate courses , B.Voc. programs etc. The introduction of Choice Based Credit system is also aimed at providing relevant training and skills exposure to the students . These initiatives could not be sustained as the curriculum design was weak often developed based on individuals perceptions without involving experts from the Industry and/or not supportive to entrepreneurship. Further the sustainability was negatively impacted due to limitations on the availability of trained teachers aware of the program objectives and the requirements of industry.

Without exception traditional affiliating Universities responsible for Undergraduate education offered in our colleges have complex problems. The increasing societal expectations in terms of value to costs have put tremendous pressure on the system to reform. With the introduction of NEP 2020 and developing the National Higher Education Qualification Framework the highly regulated system is now giving way to more flexible approaches and transforming its processes towards a learning organisation. The various schemes of the government also are aimed at empowering institutions by providing them with Autonomy and space for innovation. Further the changes being made in the Higher Education require awareness on the benefits, trust and confidence among the employers and sufficient planning and time to properly embed and diffuse the reforms among the stakeholders and society at large. At the end of this article we have detailed on some major initiatives of the Government City College(Autonomous), w.r.t. curricular , co-curricular and extracurricular interventions which resulted not only in holistic development of students but also in improved access, retention and employability and employment of the graduates. The changing Indian education space and the changing industry requirements, the evolving student populations and aspirations of the students to move across borders and continuously seeking upskilling and reskilling need a new model of education with well defined learning outcomes and graduate attributes which are comparable across educational systems.

Integrated approach to Education, Training and Employment

Reforming the system and bringing an End-to-End Transformation, NEP 2020 and the NHEQF has enabled flexibility in the system providing freedom for the students to choose from among a range of options. The structural changes happening across the education space makes it possible for students to customize the curriculum and decide their learning paths accessing

courses and learning materials from across the globe. With advances in technology and various innovative pedagogies student learning is no longer a prescription in curriculum, restricted to textbooks and assignments provided therein. Instead, the students will define how and what they want to learn which means students will define on **How and What To Learn.** As the future education system empowers students to engage with their learning and providing them ownership over their learning, the role of teachers' will be altered and expanded to be mentors and facilitators. With learning becoming more student centered - self and autonomous learning, the teacher's role will be to support the student's academic needs through mentoring and guiding them for making right choices and appropriate decisions for success in life and careers.

Globally higher technical and vocational skills are recognised as crucial not only in enhancing individual's competencies, skills and attitudes necessary to compete and perform in the labour market but also in being competitive and entrepreneurial contributing to socioeconomic development of the Nation. Skills development is a critical pillar for building a globally competitive and employable work force. A skilled and knowledgeable work force attracts investors thereby contributing to an improved investment climate and economy of the country. Currently very few of our higher education programs (other than professional) have the skills component included in the Curriculum. Most often these are introduced on an experimental basis and do not scale up. The reasons are many but the main issues are the fragmented approach with responsibility vested with different Ministries and multiple regulatory agencies. The situation is further complicated due to capacity constraints in terms of finances and human resources. To overcome these challenges and scale up the programs the Government of India is now adopting an integrated approach by bringing together various ministries responsible for Education, Training and Employment i.e. MOE, Ministry of Skills Development and Entrepreneurship, Ministry of Labour and Ministry of Industry etc. in developing strategies to promote a skills inclusive education both at the tertiary and pre-tertiary levels. To reap the maximum benefits, the new initiatives will take an outcomes-based approach to education and aim at skills development through both non formal and formal sectors with emphasis on the prospective employment segments. To have maximum impact of the initiatives our educational systems should shift to "learning based models" of education where the focus is both on formal and non-formal educational experiences and the outcomes meet the market requirements i.e. in terms of what the students know and can do on acquiring the Degree.

With majority of our youth living in rural parts of India where informal economy and Agriculture sector dominate the employment prospects, development of relevant skills catering to these segments is a necessity for improving productivity and working conditions, and the promotion of decent work (ILO Decent Work Agenda). An integrated approach to Education and skills will provide economically and socially rewarding jobs and support the transition from education to work even if somebody drop-outs from the school/college or on completion of Graduation.

The integration of job-related skills-development component at all levels of education is crucial for national development much so for India with its Demographic Dividend. Recognising this India has placed the development of skills at the centre of its development agenda mandating a skills inclusive education especially at the tertiary level.

Outcomes Based Approach

The time is ripe that we move towards "Learning based models of education" and build our tertiary education systems to adopt an outcomes-based approach. Outcomes can be determined based on its use at different levels i.e., at the institutional level, at the program level, at the instructional design level etc. As the focus of our discussion is in improving student learning in terms of skills and competencies, we will limit the discussions to learning outcomes specific to the individual learner and to some extent to the Programs.

The NEP 2020 framework highlights the need to bridge the skill gap between education and employment. The framework emphasises outcome-based education (OBE), which catalyses students' skill development in preparation for future employment. While traditional education focuses on memorising and knowledge building, OBE addresses the gap by giving more importance to subject-specific knowledge with measurable learning outcomes. This would include honing critical thinking, adaptability, teamwork, problem-solving, and communication skills.

The quality education should not be limited to the best discourse of the teacher, but it is the knowledge and skills acquired by the learner while on and beyond the campus. What a student learns and can do and achieve which reflects on the quality of education. Towards bringing this shift our educational system should have a common framework across disciplines and degrees and the curriculum should be redesigned providing impetus for quality learning and attainment of the specific competencies and skills required on graduation.

Bloom et.al 1956, identified three broad learning outcomes at the student level viz. Cognitive, Affective and Psychomotor. Cognitive outcomes refer to the content /domain knowledge that the students can comprehend, explain, analyse and apply. Affective outcomes are those related to the values and attitudes such as ethical behaviour, truthfulness, empathy etc. imbibed by the individual while pursuing the program. Psychomotor outcomes are those related to the capacity building and development of both professional and generic skills thereby improving the employability and competitiveness of the student. The outcomes-based approach involves a paradigm shift in teaching and learning. It is a process where student is the focus of teaching learning and is measured in terms of the attainment of the three broad learning outcomes i.e. Cognitive, Affective and Psychomotor by the student by the end of the program.

The four Essential features of Outcome Based Education are Vision and Mission, Program Educational Objectives (PEO), Student Outcomes (SO) and Instructional Objectives (IO). While the Vision and Mission statements lay the foundation of what the institution is to be identified with, **Program educational objectives (PEO)** are broad statements that describe the career and professional accomplishments that the **program** is preparing graduates to achieve. The different programs offered in the institute should have a link with vision and mission through the PEO. Programs will be different and hence the PEOs will be. But they all shall have connectivity with the vision and mission so that the attainment of PEOs of different programs lead to ultimate realization of vision and mission of the institute.

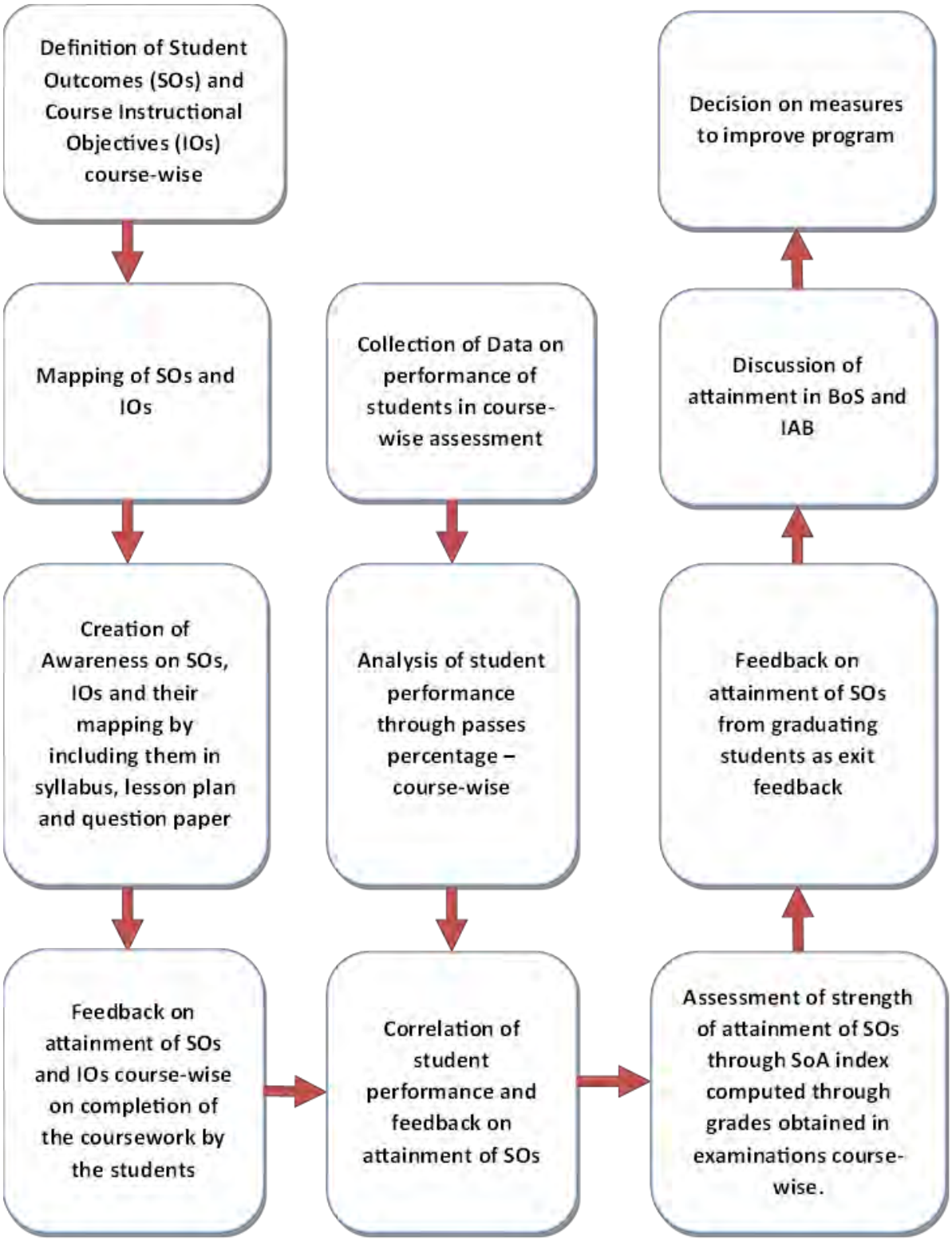
They are different from normal objectives in that they are measurable. They are defined based on what the students become after a few years of graduation. PEOs should not be confused with **Student Outcomes (SO).** SOs are relevant at the time of graduation. **Student Outcomes (SO)** describe what students are expected to know and be able to do by the time of graduation. The concept of SOs is strongly related to Blooms Taxonomy of learning. Earlier SOs were mostly defined by the academia based on their own perception. But since the advent of Outcomes based Education (OBE), SOs are defined by

1. Academicians
2. Industry experts/Employers
3. Researchers.
4. Society

Course Outcomes (CO) relate to the skills, knowledge and behaviours that students acquire as they progress through the program. Every course may be linked to one or two or more SO. However, oftentimes, it is very difficult to link the SO to course as a whole. The link interface is provided by course outcomes (CO) or Instructional objectives (IO). IO/CO serve as a bridge

between courses and SO and there is a clear mapping of IO to SO to PEO. The whole process of the OBE is process of continuous improvement as depicted below

Process of Continuous Improvement



Comprehensive System for Human Resources Development

Our undergraduate programs especially those offering liberal arts, humanities and social science need to be reformed. The need to link training to employment/entrepreneurship is at the root of all the good practices and strategies observed. Taking advantage of the initiatives of the Central Government, Universities to which these undergraduate colleges are affiliated need to reform the curriculum integrating components for providing students with employable skills and training driven by industry needs and entrepreneurship. The initiative of the MOE to adopt an enterprise-based model through apprenticeships and placement support will alleviate the Unemployment problems of the country. The Universities while adopting the Outcomes based approach should interact with various stakeholders in designing the curriculum, defining the outcomes and identifying the prospective skills requirement. The outcomes based approach will help the education and training alternate between theoretical education in the college and practical training in an enterprise. This means combining the advantages of campus-based education wherein the student acquires broad based knowledge and skills and apprenticeship of practical occupation-related company-based training where the student is provided with the specific skills and attitudes expected by the employers. With the Ministry of skills Development and Entrepreneurship providing enabling environment through certification of the multiple skills acquired by the learner during and /or after Graduation, one can change the vocation depending on the market needs and shift across sectors. This ensures gainful employment throughout. Through the scheme MOE has made arrangements with private service providers who will assist HEI to identify trades with high employability potential, train the graduates over a set period and arrange for apprenticeships in workshops and finally help graduates with job placement. The challenge however would be in identifying the support institution/service providers and quality trainers.

The major challenge would be framing regulations which are flexible enough to adapt to changing training/ skills needs and foster lifelong employability. Moreover, mapping to a National Qualifications framework will be imperative to allow students to move laterally and vertically across sectors and facilitate the dropouts to re-enter the formal system, either on a part-time or full-time basis. Also, scaling up the reforms to 45,000 HEIs without compromise to quality can be a challenge. Thus, to begin with the focus should be on diversified approaches to education which include skills development by integrating technical and vocational subjects in line with the demands of the employment market. Secondary school leavers or first degree graduates from the system should progress with ease to productive employment or higher education. The initiative is also expected to close the current gaps existing in the system i.e. between skills needs in industry and educational curricula; between schools and colleges and colleges and universities; between formal training and industry based training or informal training etc.

Curriculum Enrichment Strategies: Implementation and Outcome

'A Case Study of Govt. City College (A), Hyderabad, Telangana'

Curriculum revision and enrichment typically aims to enhance various aspects of education to better meet the needs of students, educators, and society. Key goals include updating content to reflect current knowledge, technologies, and societal needs (relevance); incorporating more interactive, hands-on, and student-centered learning approaches (engagement); focusing on critical thinking, problem-solving, digital literacy, and other 21st-century skills (skills development); ensuring inclusivity and accessibility for all students regardless of their background or abilities (equity); developing better assessment methods to accurately measure student understanding and skills (assessment); promoting interdisciplinary learning and subject integration to reflect real-world applications (integration); providing educators with the necessary resources, training, and professional development (teacher support); including global issues and perspectives to prepare students for a connected world (global perspective); emphasizing environmental education and sustainability to foster awareness and responsibility for the planet (sustainability); and addressing students' social and emotional development alongside academic learning (well-being).

The overarching goal is to equip students with the knowledge and skills needed for higher education or employment, ultimately fostering their success. This paper explores the curriculum enrichment strategies implemented at Government City College (Autonomous), Hyderabad, focusing on the programs and initiatives designed to ensure student success.

Established in 1921 as a high school, Government City College has evolved significantly over the past century. It was upgraded to a college in 1956, taken over by the government in 1967, and granted autonomous status in 2004. The college celebrated its centenary year in 2021-22 and anticipates extending its autonomous status in 2026. This historical evolution reflects the institution's commitment to adapting and expanding its educational offerings to meet contemporary demands.

Curriculum Enrichment & Implementation Strategies

Honours and Special Programs

The college is the only college in the state to introduce a range of honours programs in various disciplines, such as History, Political Science, Economics, Biotechnology and Computer Science. These programs are designed to provide students with in-depth knowledge and specialized skills in their chosen fields. Additionally, special programs like BA in Public Policy & Governance and BA HEP Special are tailored to meet the specific interests and students aspiring to higher education progression with career goals in civil services.

Skill Embedded Programs

Skill embedded programs with on-job training (OJT) are a cornerstone of the college's curriculum enrichment efforts. These programs, such as BA in Creative & Content Writing, BBA in Retail Operations and BBA in Tourism & Hospitality Management integrate practical skills and industry exposure from the first semester. Collaborations with industry partners ensure that students receive hands-on training, making them more employable upon graduation. The college is introducing BSc Pharma Manufacturing & Quality Control (Apprenticeship Embedded Degree Program) from the AY 2024-25 that focus on both theoretical and practical aspects ensures that graduates are well-prepared to meet the challenges of pharmaceutical manufacturing and quality assurance. Skill-embedded programs are significantly boosting student placement rates, as industries partner with colleges to offer 100% placement. These programs include an apprenticeship component, providing students with specialized training in their field, along with a stipend, allowing them to earn while they learn.

Industry-Oriented Programs

To align with market demands, the college offers industry-oriented programs like BCom in Finance, BCom in Business Analytics, BCA, BSc in Artificial Intelligence and Machine Learning, BSc in Data Science, MSc in Physics (Nano Science), and MSc in Physics (Material Science). These programs incorporate the latest technological advancements and industry trends, preparing students for high-demand careers. These programs target students from commerce and physical sciences stream facilitating easy placements in the corporate industry by offering highly relevant knowledge and skills that align with current market needs. As a result, there is a high demand for seats, with applications exceeding the program's intake capacity.

Add-on and Value-Added Certificate Courses

The college provides numerous add-on and value-added certificate courses to complement the main curriculum. These courses cover a wide range of topics, including:

- **Banking Financial Services & Insurance (BFSI)**: Available to all streams, this course equips students with financial industry skills with a compulsory placement opportunity in top MNCs.

  The Telangana chapter of the Banking, Financial Services, and Insurance consortium, in consultation with the Universities' Board of Studies, developed a curriculum that integrates essential industry skills into the regular program. This approach ensures that upon completion, students have a 100% placement opportunity in banking and financial allied services.
- **Entrepreneurship Development Programme**: Encourages innovation and startup culture among students.
- **Innovation & Start-ups**: Focuses on fostering entrepreneurial skills and creative thinking.
- **Department-Specific Courses**: Various departments offer specialized courses like Creative Writing, MATHEMAGIC, ChemDraw, Museology, Floriculture Techniques, Research Methodology, MATLAB and Aquarium Fish Keeping.

Career Guidance for Placement & Progression

The college has an established Career Guidance Cell that offers **Civil Services Foundation Course of 150 hour** every semester for selected 100 students through a preliminary examination in collaboration with the BC Study Circle, Govt. of Telangana. The course is also extended to the students of other colleges who are top listed in the examination.

This coaching module has been designed in such a way that it acts as an appetizer and also helps as guidance to needful students coming from rural areas with a career goal in central and state services. This in turn helps in the upliftment of so many families belonging to under privileged sections once these beneficiaries settle down in their career.

The established G-Cell provides guidance, counseling for overseas education and free coaching for English proficiency tests like IELTS/TOEFL/DUOLINGUO.

Collaboration with Industry and Institutions

The College collaborates with various industry partners and premier institutions to enhance its curriculum. Notable collaborations include:

- **Retailers Association Skill Council of India**: Partners like Reliance Trends, Manyavar, Starbucks, Med Plus, and Spar provide On the job training opportunities to all the students admitted in Skill Embedded Programmes .

- **Spoken Tutorials (IIT Bombay)**: Offers courses in programming languages and software applications.
- **Anudip Foundation**: Provides training in digital skills.
- **MSME (Micro, Small, and Medium Enterprises)**: Supports entrepreneurship and skill development.
- **TASK (Telangana Academy for Skill and Knowledge)**: Enhances employability through skill training.
- **BC Study Circle, Govt. of Telangana:** Provides training to students to ensure their success in competitive examinations and enhance their employability.
- **Global Education and Careers Forum:** Mentoring Young Indians to be Globally Ready by Up-Skilling, Re-Skilling and Benchmarking Globally
- **The Tourism and Hospitality Sector Skill Council of India** offers a program called Tourism and Hospitality, a skill-embedded curriculum where students undergo apprenticeships with stipends.

These collaborations ensure that students receive practical training and industry exposure, making them job-ready or higher education in premier national institutions or abroad universities.

Achievements and Outcomes

The college's curriculum enrichment efforts have yielded significant results in terms of higher education and placement rates. Over the past five years, there has been a consistent increase in the number of students securing admissions in IITs/IIM/Central Universities/Universities abroad and Placements. 96 students cleared the police constable exam conducted by the Govt. of Telangana in 2022-23 and many cleared the Group IV Services exam and are ready for certificate verification showcasing the college's success in preparing students for competitive examinations.

Challenges and Solutions

Despite the success, the college faces several challenges in implementing curriculum enrichment:

- **Orientation and Awareness**: Ensuring students and parents are aware of the various programs and opportunities available.
- **Mentoring and Monitoring**: Providing consistent guidance and support to students engaged in On Job Training.
- **Faculty Development**: Training and engaging faculty in the latest teaching methods and industry trends.
- **Curriculum Development**: Continuously updating the curriculum to align with industry demands.
- **Infrastructure and Resources**: Ensuring adequate infrastructure, books, and e-

content are available.

To address these challenges, the college emphasizes:

- **Orientation Programs**: Regular sessions to inform and engage students and parents.
- **Mentoring and Monitoring Systems**: Establishing robust systems for student support.
- **Faculty Development Programs**: Conducting training and workshops for faculty.
- **Curriculum Review**: Regularly updating the curriculum with input from industry experts.
- **Infrastructure Development**: Investing in infrastructure and resources to support enhanced learning experiences.

Government City College (A) Hyderabad's curriculum enrichment initiatives demonstrate a comprehensive approach to enhancing students' educational experiences and outcomes. By offering a diverse range of programs, integrating practical skills and industry exposure, and addressing challenges through strategic solutions, the college is well-positioned to achieve its goal of student success. These efforts not only prepare students for higher education and employment but also equip them with the skills and knowledge necessary to navigate the complexities of the ever-changing world and contribute positively to society.

Conclusion

The increased access to technology resulted in significant increase in accessing and use of information and knowledge which in turn has impacted the education system. Despite the changing needs of the students and the society, majority of our educational institutions continue to operate the way they were for decades. This has resulted in churning out graduates not prepared for the work life, increased rates of unemployment and mounting dissatisfaction among the youth and employers. This calls for a systematic reform of our education system which should not only respond to the global trends but also support the economic and social development of the Nation. The reformed education should enable learning environments and should include restructuring of the Curriculum, Pedagogy and Assessment etc. transforming our institutions to knowledge-creating organizations.

The growing need of performance excellence in Higher Education Institutions need continuous improvement. Inability to precisely understand the needs of improvement can lead to wastage of efforts and resources. We all agree that there is need to reform our education system for which we need to move away from the traditional approaches and revise our curriculum to suit the current societal needs. We have to encash on the demographic dividend and ensure that our youth are productive contributing to the

national economy. For this we have to embrace the integrated education model with knowledge, skills and employability embedded into the process and design the process and curriculum adopting the outcomes based approach. Learning outcomes together with constructive alignment (alignment of outcomes, teaching and learning and assessment) has the potential to embrace a more systematic approach to program design and delivery and ensure achieving the intended outcomes. In such learning based education models, the learning is an integrated experience which occurs in an environment created to promote dialogue, inquiry and reflection.

As India stands at the precipice of a transformative era, reimagining education, emphasizing on-the-job training, and embracing apprenticeships will be pivotal in shaping a workforce that is not just equipped with theoretical knowledge but possesses the skills that gives businesses competitive advantage. India's future success lies in nurturing a workforce that is agile, adaptable, and ready to thrive in the dynamic landscape of the global economy. Adoption of the OBE which is a continuous improvement model will provide clarity as it has the inbuilt features to empower both the students and teachers and contributes to learning effectiveness and instructional quality and is also one of the ways to create resilience.

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Aligning Higher Education Pedagogies for Education of Present and Future

Prof. Dr. Vanaja.M[14]

Introduction

> *"The secret of change is to focus all your energy not into fighting the old but building of the new." - Socrates*

Today, we are in a world of unprecedented disruptions and we are facing daunting challenges – social, economic and environmental – driven by accelerating globalisation and a faster rate of technological developments. At the same time, these forces are providing us with myriad new opportunities for human advancement. The future is uncertain and we cannot predict it; but we need to be open and ready for it. Schools are preparing them for jobs that have not yet been created, for technologies that have not yet been invented, to solve problems that have not yet been anticipated. It will be a shared responsibility to seize opportunities and find solutions. To navigate through such uncertainty, students will need to develop curiosity, imagination, resilience and self-regulation; they will need to respect and appreciate the ideas, perspectives and values of others; and they will need to cope with failure and rejection, and to move forward in the face of adversity. Their motivation will be more than getting a good job and a high income; they will also need to care about the well-being of their friends and families, their communities and the planet.

Education is a powerful tool that should be used to transform society into being more future-oriented, sustainable and peaceful. Education can equip learners with agency and a sense of purpose, and the competencies they need, to shape their own lives and contribute to the lives of others. In an effort to create such a society, we must re-examine the foundations of education by posing several questions, including: i) What is being taught (what subjects and how are they organized and presented)? ii) Who is being taught (who are the students *and* what are the educators' perceptions of the student population)? iii) Who is doing the teaching (what is the educator's background—e.g., gender, race, socio-economic status - especially as compared to or contrasted with the student population)? And iv) From whose perspective (educator *and* students should be aware of the subjectivity in any text or information provided)? These questions help to gain clarity and assist in the necessary deconstruction of the pedagogical processes that are being utilized, in addition to allowing for a clearer articulation of our desired pedagogical processes for today and beyond.

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Higher Education: A Journey from 1.0 to 5.0

Humans have been learning and adapting to new environments since the dawn of civilization. This trend has been going on for thousands of years in many aspects of human existence, but the introduction of information technology accelerated the process of learning and adaptation rapidly. Education not only prepares individuals with better values to live within society but at the same time assists them to procure the abilities and skills required for sustainable development. The United Nations 2030 agenda has acknowledged education as a critical component of sustainable development.

One of the United Nations' Sustainable Development Goals is to improve education and has been stated as: "Sustainable Development Goal 4 (SDG4): Quality Education—Ensure inclusive and equitable Quality Education and promote lifelong learning opportunities for all" (2017) and "Sustainable Development Goal 9 (SDG9) of Industry, Innovation, and Infrastructure".

Simultaneously, the education structure of the 21st century has transformed drastically. It is difficult to believe how drastically different the situation was only a few years back since the world we live in is changing so quickly and unpredictably. In the last few decades, the Internet and how people use it have also undergone significant transformations. One of the major areas where this transformation can be seen is in the teaching–learning process. Technology, pedagogy, implementation strategies, and institutional frameworks can all be used to implement flexible learning in higher education.

The presentation by Makrides, G. et al (2019) on "The Evolution of Education from Education 1.0 to Education 4.0: Is It an Evolution or A Revolution?" discussed the salient features of the developmental stages of education from Education 1.0 to 4.0. It tried to justify whether it is an evolution or a revolution directed by the modernization of technology in parallel with the upgrade of student and industry needs. The progress and transformation in education along with the Industrial revolution is graphically described in the Fig.1.

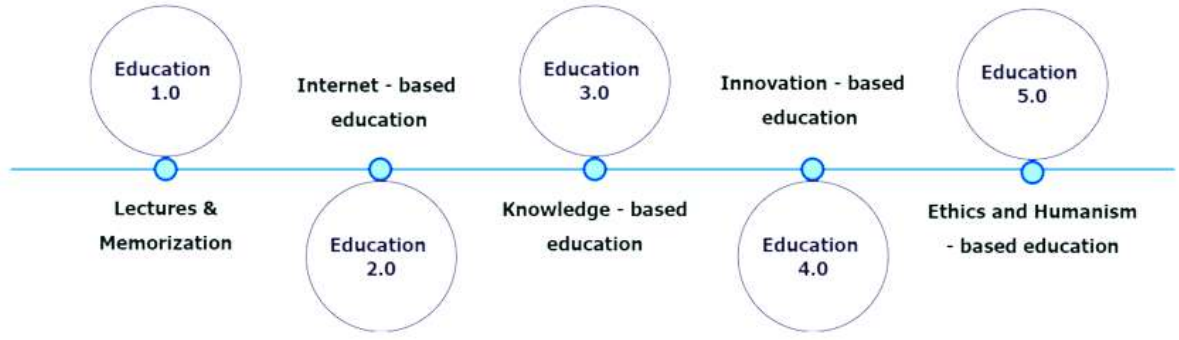

Fig. 1. Progression of Education (Ahmad, Ishteyaaq et.al. (2022))

Education 1.0

Education 1.0 or Classroom 1.0 reflects an authoritarian teaching setting where the student was only a passive recipient of the concepts or ideas taught by the respective teacher within a physical classroom setting. It forbids the use of any type of technological application. The teacher acts as a knowledge leader and determines the most significant topics for the student to learn without having any regard in understanding the learning interests and needs of students.

Education 2.0

The Education 2.0 or Classroom 2.0 framework reflects the growth of communication and teacher-student interactivity within the physical classroom setting. Here, the involvement of technology for sharing learning resources can be effectively observed in terms of using broadcasting mediums like television and radios for designing and communicating learning programs. Likewise, the use of a projector in class is also observed for the rendering of learning materials via slides.

Education 3.0

The Education 3.0 or Classroom 3.0 framework is essentially student-centric where the teacher acts as a facilitator and advisor. The Education 3.0 setting involves a blend of both classroom and online-based teaching practices. This type of teaching framework is driven by factors like self-directed learning, problem-solving activities, needed creativity, and potential interactivity between the teachers and students. Information Technology (IT) is extensively used in the teaching process for the development of approaches like blended learning, flipped classrooms, and also the development of e-learning platforms. Learning resources that can be accessed by the students based on their convenience are shared by the teachers online. Though both blended and flipped learning approaches reflect a combination of both physical and online learning and instructional modes yet the latter involves greater interactivity between the student and teacher.

Education 4.0

Education 4.0 or Classroom 4.0 accounts is regarded as the most innovative platform that is noted in terms of the *Evolution of the Education Framework*. The framework of Education 4.0 is still in its developmental stage that focuses on enabling students to carry out learning irrespective of time and place. Education 4.0 framework encourages the carrying out of project-based and practical learning approaches wherein the students are evaluated rather than being examined as done in the traditional frameworks. The use of social networking platforms like YouTube for the development of learning videos; use of Zoom platforms for conducting webinars involving teachers, students, and experts coming from diverse industries; use of Artificial Intelligence (AI) and Chatbots for generating

instantaneous responses to students are some effective examples of the Education 4.0 in process.

In the 21st century, technology started to permeate the educational process, and both students and teachers started the use of technology in education in fundamental ways that came to be known as Education 2.0. Technology advancements, particularly the wide adoption of a more user-generated internet, led to the emergence of education 3.0.
Now, Education 4.0, a learning approach associated with the fourth industrial revolution, aims to transform education in the future through cutting-edge technology and automation. This technological revolution includes robotics, artificial intelligence, and smart technology.

Research by McKinsey Digital revealed that 60% of all occupations could potentially have at least a third of their activities automated due to the fourth industrial revolution. Hence, an increasing need to adopt Education 4.0 and the use of technology in education. Here are the key benefits of education 4.0:

- **Preparing students for evolving industries:** The skills required of employees will surely evolve as more organisations combine cyber-physical systems. The ability of technology to keep us connected at all times has led to an increase in the flexibility and adaptability of job duties. Hence, Education 4.0 is all about adapting to change, bringing the use of technology in education and for schools to determine what their future students will require.
- **Automating basic administrative tasks:** Administrative work takes up a lot of time for teachers. Automation of activity grading and assessment will become easier with the use of technology in education, benefitting the teachers. Automating administrative duties with cutting-edge technologies like artificial intelligence (AI) and machine learning (ML) enables teachers to spend more time with students, further enhancing the learning experience in classrooms.
- **Offering personalised education:** The purpose of AI and ML in education is to aid teachers in better understanding each student's potential and limitations through the use of technology in education. Each student has a different learning method and pace & teachers are able to cater to these needs of students now through AI and ML.
- **Providing constructive criticism:** AI can be used by teachers in the classroom to improve the guidance they give to their students and to make studying more exciting as the students are engaged in active learning. It also allows teachers to provide students with instant feedback, which helps students, identify their weaknesses and figure out how to address them.

- **Offering access to all pupils:** AI and machine learning are utilised in the classroom to make learning accessible to all students. Even students who are visually impaired or have hearing disabilities can access education with the help of AI tools like real-time subtitles, etc. The use of well-designed artificial intelligence in education enables teachers and students to benefit from the advancements in technology that can improve educational methods. AI-powered tools will assist teachers in improving students' academic performance and sharpening their critical thinking abilities.

Education 5.0

Education 5.0 is the use of new technologies to provide more humanized teaching, with a focus on students' social and emotional development and solutions that improve life in society. All social spheres – like work, industry, and health – have come to understand that technology can (and should) be favourable to life. And it couldn't be any different with education, which is the basis of people's upbringing. Over the last few decades, we have witnessed a boom of digital transformation and new technology in our day-to-day. Artificial Intelligence, the Internet of Things, data processing, and other tools have been embedded in our lives and in companies. With the Covid-19 pandemic, life turned more digital, and things were no different in educational institutions. Online classes and distance learning were no longer trends, but reality, and everyone had to get used to them. But beyond technological devices, the pandemic made clear the need to prepare human beings for adversity, for emotionally intelligent people who know how to turn digital transformation into a tool for social transformation. And that's exactly what Education 5.0 is: a chain that links digital and technological knowledge to human social and emotional skills to promote well-being.

The differences between Education 4.0 and 5.0

In 4.0's proposition, the role of technology in education is to promote speed, accuracy, and knowledge in instruction. The main idea is to insert Industry 4.0 technologies – the Internet of Things (IoT), artificial intelligence, machine learning, gamification, and others – into learning and educational institutions. The goal is to bring education closer to technological advances already in use by society and companies, as well as to create more direct communication with new generations, who no longer can live without technology. Education 5.0 is the outgrowth of this idea. It doesn't discard the proposals of Education 4.0, but it adds a more human perspective to learning, including social and emotional abilities in order to promote lesser environmental impact with greater health and safety. If baby boomers and Generations X and Y had an education based on technical knowledge for professional training, Generation Z now has access to Education 5.0. Education 5.0

and Society 5.0 are two distinct concepts, but they are interconnected and complementary in their approach to shaping the future of human development and societal progress.

Education 5.0 can also be applied to other types of institutions, both public and private, from basic education to graduate degrees. Furthermore, not only distance learning will benefit from this, but also regular mode formal institutions. Many educational establishments are stuck in time when it comes to technology. Even when they have management software, these platforms aren't always integrated and pedagogic and administrative processes are kept separate. And it's not only the educational establishments that are behind the times. Many professionals are left behind and still teach the way they learned at the beginning of their careers. To turn viewpoints to Education 5.0, it's essential for faculty to be trained in this new outlook. If before the focus was to develop technical abilities in students, now it is to concentrate on soft skills. In that regard, a new platform for education management plays an essential part. Its primary function is to unify instructional and pedagogical processes with academic operations as a whole. An integrated platform can collect, process, and analyze data on all processes and provide a unified cloud management accessible to all in: Student selection, Enrolment, Marketing and public relations, Document and data management, HR management, Financial management and IT management, Integrated operations make it possible to look after the health of the institution's financial management, make operations more agile, leaner, and less bureaucratic, and improve students' experience via digital and more personalized communication. And, of course, it also improves instruction. A digital transformation like this is an essential step for learning to be always enhanced and adapted to new social demands.

Pedagogies for Higher Education

Humans evolve through various cultures, geographies, catastrophes, religious and political revolutions, different learning theories continue to form. As tools of imparting knowledge expanded, marked by psychology, culture and previous experiences, people realized that every person has his own unique style of learning, and more and more learning theories came into being. As the science and art of knowledge got more refined and organized, many of these theories got tested with measures of outcomes, leading to the formation of more theories. Even though classically there are three fundamental learning theories, i.e., behaviorism, cognitivism, and constructivism, new concepts of 'gogies' including but not limited to pedagogy, heutagogy, peeragogy and andragogy continue to be added . With the advent of the internet and rapid globalization, other terms such as cybergogy are being introduced, and we expect to hear many such new terminologies in the future (Figure 2).

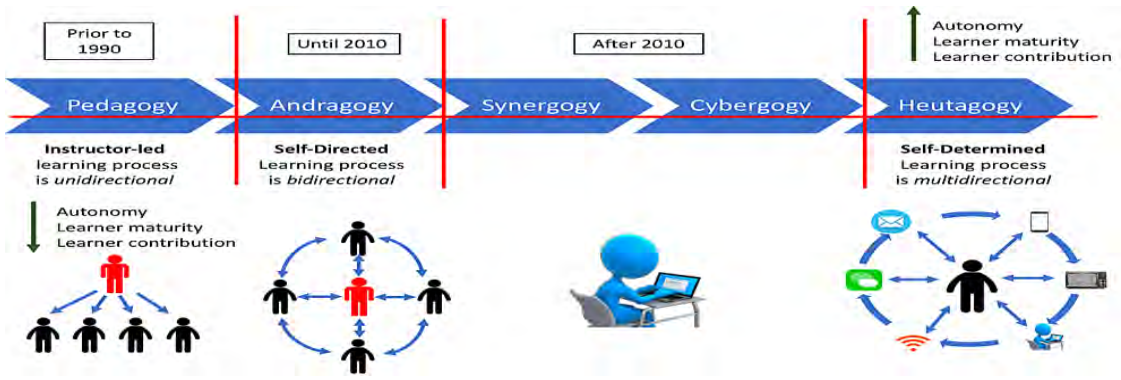

Figure 2: Learning theories – Pedagogies at a glance

Pedagogy

In a literal sense, the word pedagogy stems from the Greek word that effectively means "the art of teaching children." More specifically, agogos means leader in Greek, and pedagogue refers to the teacher. Paidagogos were slaves tasked with taking boys to school and back, teaching them manners and tutoring them. Pedagogy is often confused with curriculum. The definition of pedagogy refers to how we teach—the theory and practice of educating. Curriculum refers to the material being taught. Pedagogy, meaning the relationship between learning techniques and culture, is determined based on an educator's beliefs about how learning takes place. Pedagogy requires meaningful classroom interactions between educators and learners. The goal is to help students build on prior learning and develop skills and attitudes. For educators, the aim is to present the curriculum in a way that is relevant to student needs. Shaped by the educator's own experiences, pedagogy must take into consideration the context in which learning takes place, and with whom. It isn't about the materials used, but the process and the strategy adopted to lead to the achievement of meaningful cognitive learning.

Andragogy

Andragogy is the study of how people especially adults learn. It's also known as instructional design and human-centered design. The term "andragogy" was first authored by Alexander Kapp (1833), a German high school teacher. Andragogy has been defined as "the development of human potential through deliberate interdisciplinary interaction between adults, who are at various stages in their learning process, and educators." It is "the study and application of principles of adult learning". Andragogy is also known as "adult education" and "adult learning."

Andragogy is based on the idea that humans learn best when they are engaged with their surroundings and actively involved in the process of learning. This means that learning should be fun, interesting, and meaningful for students—not just because it's required by some teacher or curriculum. Andragogy has been used successfully in education for decades, but it wasn't until recently that we learned more about what makes this theory

work so well. It is an approach to education that focuses on the learner's life, rather than simply their academic potential.

Andragogy also emphasizes that educators should select teaching methods that help students develop their social and emotional skills, as well, as their intellectual ones. For example, if a teacher knows that her students are having trouble learning math because they don't like math or have trouble following directions well, she might try to re-teach the lesson differently to better appeal to their learning styles. If this doesn't work, then perhaps she will change her teaching style or use another method altogether so that they will be more successful when it comes time for them to take an exam in math later on down the road at school. The concept of andragogy grew out of the idea that learning should be a lifelong process, not just a series of discrete steps toward adulthood. Andragogy also emphasizes a balance between student-centered and teacher-centered approaches to education. Andragogy has been applied successfully to many different types of instruction, including business courses, nursing programs, and even military training. It has been used in classrooms across the country in some way or another since its introduction. The main aim of Andragogy is to find out why people learn a particular thing and how they can be taught that thing more effectively.

Cybergogy

Cybergogy is a paradigm that combines technology and education to facilitate learning in virtual environments. The application of educational technology has created a new teaching and learning concept – Cybergogy. One of the central elements of cybergogy is the intent to combine fundamentals of both pedagogy and andragogy to arrive at a new approach to learning and teaching (Carrier & Moulds, 2003). Cybergogy focuses on helping adults and young people to learn by facilitating and technologically enabling learner-centered autonomous and collaborative learning in a virtual environment.

At the core of cybergogy is awareness that strategies used for face-to-face learning may not be the same used in the virtual environment. It involves the use of cyber-physical learning, augmented reality, and 3D immersive virtual worlds to enhance teaching and collaboration. Cybergogy offers various benefits such as increased access to information, intellectual discussions, and engaged learning. It has been found to be effective in improving student learning outcomes, with augmented reality-based digital learning materials showing promising results.

The Cybergogy for Engaged Learning model, as Wang and Kang (2006) present, has three overlapping/intersecting domains: cognitive, emotive, and social (see the figure). The authors argue that engaged learning will occur when the critical factors in each domain are well attended, so as to encourage learners' cognitive, emotive, and social presence. This model is created particularly for online settings that involve more generative and

constructive learning activities. For the online learning experience to be successful, students must be furnished with prior knowledge, motivated to learn, and positively engaged in the learning process. In addition, Wang and Kang suggest, students must also be comfortable with the learning environment and feel a strong sense of community and social commitment. The Cybergogy for Engaged Learning model could be used to conduct needs assessment and to lay out course design and facilitation techniques. Instructors could use this model to profile each student's cognitive, emotive and social attributes and then effectively engage learners by addressing individual's learning needs and attributes (Wang & Kang, 2006). The authors identify methods that instructors can use to detect learners' emotional cues and cultivate their positive feelings; to increase learners' self-confidence and arouse their curiosity through course design and e-facilitation; to conduct online communication and build a supportive learning environment. The pedagogical model of Cybergogy of Learning Archetypes and Learning Domains has been specifically developed for teaching in 3D virtual worlds. Cybergogy is being implemented in various educational settings, including higher education institutions and rural telecenters, to bridge the digital divide and promote knowledge sharing. Faculty members are adopting cybergogy to design and deliver online courses in virtual environments.

Synergogy

Synergogy is a teaching and learning methodology that focuses on the interaction between the facilitator and the learners in a collaborative learning environment. The term "synergogy" was first coined by Robert Gagné and his colleagues in the 1970s, and it is based on the idea that learning is most effective when there is a synergistic relationship between the learner and the facilitator. The term "synergogy" was later defined by Richard Schmuck and Patricia Schmuck in their book "Group Processes in the Classroom" (1983), in which they outlined the principles of synergogy.

Synergogy emphasizes the importance of active participation and collaboration among learners and the facilitator, as well as the use of real-world examples and experiences to promote meaningful learning. It also emphasizes the use of feedback, both from the facilitator and other learners, to enhance the learning process. Synergogy encourages the facilitator to be a guide and mentor rather than an authoritarian figure, creating a supportive learning environment where learners can share their experiences and perspectives. The facilitator helps to create a positive learning environment where learners feel comfortable taking risks and learning from each other.

The principles of Synergogy include: i) Collaboration: Learning is enhanced when individuals work together in groups and engage in collaborative problem-solving and decision-making ii) Active learning: Learning is more effective when individuals are actively engaged in the learning process, rather than passively receiving information iii) Reflection: Learning is deepened when individuals take time to reflect on their experiences

and discuss their insights with others iv) Experiential learning: Learning is enhanced when individuals have opportunities to apply new knowledge and skills in real-life situations and v) Diversity: Learning is enriched when individuals come from diverse backgrounds and bring different perspectives and experiences to the group.

Overall, synergogy is an approach that recognizes the value of collaboration, interaction, and feedback in the learning process and it emphasizes the importance of the facilitator's role in creating a supportive learning environment. Synergogy is often used in the context of adult education and training, where it is used to design and facilitate group learning experiences.

Heutagogy

Heutagogy is a term derived from the Greek word ''heuriskin'', which means to discover and also underlies the etymology of the word heuristic. The meaning of the heuristic is to enable someone to discover or learn something for themselves. Heutagogy is derived from the same Greek root and was coined in 2000 by Hase and Kenyon to indicate self-learning. Heutagogy, aka self-determined learning, is a student-centred instructional methodology that focuses on the development of autonomy, capacity, and capability. The traditional educational approach for the longest time focused on inculcating bookish knowledge, which the students may or not implement. The biggest disadvantage of this is unproductive learning, which only serves to harm the students in the long run. Mainly because whatever they learn during the classes, they fail to understand it, hence are unable to apply them in practical situations. Heutagogy learning is unique and novel because it is neither planned nor linear. On the contrary, it is informal and parallel in respect to how people's learning continues still after the class and outside the school setting. Although the teacher does not play a central role in this strategy, they serve more as a coach- a valuable resource.

The formal education system has a pre-defined model in which the institutions and teachers streamline learning. There is a significant role of the blackboard and other traditional teacher-centered learning processes in schools. **Heutagogy theory** is a student-centric self-learning instructional methodology that develops independence, ability, and qualification. It provides lifelong learning to prepare students for new technology and the job domain. The Principles of Heutagogy are: i) Self-learning strategy which means the learner's belief in their abilities. Capability demonstrates the acquired competency as well as skills and combines both qualities to create a transformational self-learning strategy ii) Non-linear learning - Linear learning provides a route map of how to walk on the education method but **heutagogy theory** has a strategy that allows students to choose their path in a non-linear learning environment. iii) Learner mechanism: Learner agency is a central strategy of heutagogy in which the student is the immediate agent of their learning. The learner makes every decision about the study, from choosing the topic to ways to use to complete the learning process in **heutagogy theory**. They also decide

how to execute the learning process and whether they have achieved the learning goals to the extent they have planned.

Pedagogical Strategies

Having a well-thought-out pedagogy can improve the quality of teaching and the way students learn, helping them gain a deeper grasp of fundamental material. Being mindful of the way we teach can help us better understand how to help students achieve deeper learning. And it can, in turn, impact student perception, resulting in cooperative learning environments. The proper pedagogical approach helps students move beyond simple forms of thinking as defined in the Bloom's taxonomy pyramid, like basic memorization and comprehension, to complex learning processes like analysis, evaluation, and creation. Students can leverage their preferred learning styles with a teaching process that supports them, and the way they like to learn. There are countless pedagogies that can help you engage students. By implementing activities from different pedagogical techniques in one's classroom, we can ensure students can tackle learning in a way that best meets their needs.

The nine pedagogical approaches that help students develop higher-order thinking skills and provide a more nuanced understanding of how their learnings fit into the world around them are:

1) **Constructivist Teaching Strategies**: Constructivist strategies help students understand the meaning of their learning materials, instead of just passively ingesting content. Rather than focusing on the subject or lesson being taught, educators are encouraged to focus on how the student learns. The KWLH Learning Schedule-Based Teaching Strategy is a structured work plan based on four steps: K-what do I know; W- what do I want to know; L- what have I learned; H- how can I learn more. After finishing a unit or series of lessons, have learners fill out a chart with the following fields: What we know, What we want to know, What we have learned, How we know it.
2) **Inquiry based Learning**: Inquiry based learning encourages a student to ask questions and complete research while learning various concepts. The pedagogy focuses on helping learners acquire the skills necessary to develop their own ideas, as well as question themselves and group members in a constructive way. The four steps of inquiry-based learning are:
    i. Developing problem statements that require students to pitch their question using a constructed response, further inquiry and citation.
    ii. Researching the topic using time in class where the instructor can guide students in their learnings
    iii. Presenting what they've learned to their peers or to a small group

iv. Asking students to reflect on what worked about the process and what didn't. Students focus on how they learned in addition to what they learned, to activate metacognition skills (or thinking about thinking).

3) **The Socratic Method:** The Socratic Method is a traditional pedagogy named after Greek philosopher Socrates, who taught students by asking a series of questions. The principle underlying the Socratic Method is that students learn through the use of critical thinking, reason and logic. To implement Socratic learning strategies in one's classroom, students are arranged in inner and outer circles. The inner circle engages in discussion, while the outer circle observes and takes notes. The outer circle then shares their observations and questions the inner circle with guidance from the instructor.
4) **Problem based Learning:** In problem-based learning, students acquire knowledge by devising a solution to a real-world problem. As they do, they acquire knowledge, as well as communication and collaboration skills. Concept mapping is an engaging activity that helps students tackle complex course concepts. Divide the class into teams and present them with a course-related problem. One team member writes down a solution and passes the sheets of paper along to the next team member, who builds upon that idea and then passes it along to the rest of the team. In the end, a spokesperson can present their ultimate solution. In a study monitoring the learning of students in an Engineering course, the research found that participants' learning gains from problem-based learning were two times their gains from a traditional lecture.
5) **Collaborative Pedagogy:** Collaborative Pedagogy rejects the notion that students can think, learn and write effectively in isolation. Collaborative pedagogy is a learner-centered strategy that strives to maximize critical thinking, learning and writing skills through peer-to-peer interaction and interpersonal engagement. Teachers can set up stations or posters in a few locations around the classroom and get students to participate in a gallery walk. Students are divided into small groups and we can rotate between each station together sorting their observations into categories. Finally, they are asked to write down a list of questions about the source material they are viewing.
6) **Integrative Pedagogy:** Integrative learning is the process of making connections between concepts and experiences so that information and skills can be applied to novel and complex issues or challenges. Hands-on learning experiences, like community service, are a great way to bring integrative pedagogy into the classroom. Holding fundraisers, volunteering at local schools or old age homes or preparing meals for those experiencing food insecurity are forms of experiential learning that can help students take part in community service activities.

7) **Reflective pedagogy:** Reflective Pedagogy encourages the instructor to reflect upon lessons, projects and assessments, with the goal of improving them for future use. Students are also encouraged to reflect on their performance on assessments and look for areas where they can improve. Conversation stations are a great way for students to engage with their peers and reflect on their own learnings. Instructors start by sharing a list of discussion questions pertaining to a course reading, video or case study. Students are put into groups and given five-to-ten minutes to discuss, before rotating to another group. The students who have just joined a group have an opportunity to share findings from their last discussion, before answering the second question with their new group. Similarly, reflective pedagogy is useful when used as a complement to placement-based internships. These pedagogical strategies allow students to understand what they have learned and experienced on a deeper level.
8) **Critical Pedagogy:** Critical Pedagogy asserts that issues of social justice and democracy are not distinct from acts of teaching and learning. It is a theory and practice that helps students question and challenge prevalent beliefs and practices—and achieve critical consciousness. Flipped classroom strategies aim to increase student engagement and learning by having student's complete readings at home and then work on live problem-solving during class time. These strategies allow instructors to orient their teaching to be knowledge-based, focusing on the development of critical thinking skills and understanding what it means to create a just society.
9) **Culturally responsive pedagogy:** Culturally responsive teaching is a more modern pedagogy that acknowledges, responds to and celebrates fundamental cultures. It strives to offer equitable access to education for students from all cultures. Teachers can use learning stations in their classroom to accommodate a variety of student learning styles at the same time. Whether due to culture, socialization, preference or learning needs, students respond differently to a variety of content. We can provide a range of material to each student by setting up learning stations where students can play a game or watch a video.

Creating and Aligning Pedagogy

Pedagogy can allow students to gain a deeper understanding of subject matter and can help them apply their learnings to their own personal experiences outside the classroom. Teachers can work together with students to come up with the best way for subject matter to be studied. To create one's own pedagogy, we have to begin by forming a personal philosophy of teaching statement. This is a crucial step in the profession of teaching. This helps students manage their expectations about your teaching methods and better approach your curriculum. The teacher has to critically, make sure to support students in finding the best ways to understand the subject matter and encourage

engaging discussions in the classroom. It's also important to be mindful of the different educational experiences students have and their preferred methods of participation, as well as their personal experiences and backgrounds. That might include monitoring for cues like wait time between talking in a conversation, eye contact or using written forms of communication, like discussion threads. We can use real-world experiences to demonstrate abstract concepts, and link them back to everyday experiences to which students can relate. Followed by activities that are purpose-built to involve students, this helps learners break down course concepts in their own ways.

Once we have created your own pedagogy in higher education, you can then develop course material and activities that are challenging for students. This will assist them in cognitive development, ensuring that they advance their understanding of concepts to higher levels. With a clear understanding of one's pedagogy, students can follow the teacher's instruction and feedback clearly. They know what they need to do and how to do it, and can respond in kind. This encourages engaging dialogue between educators and students, as well as among students themselves—that's because everyone shares ideas, questions, and knowledge to explore concepts and deepen their knowledge.

With a clear and concise understanding of pedagogy, everyone is on the same page. Students can comfortably share ideas and understand how curriculum will be approached and what's expected of them. Students expand their knowledge base, but also understand how to use their learnings in authentic and relevant real-world contexts. They can draw on their own cultural knowledge as well to come up with unique and personalized thoughts and opinions. Concrete evidence, facts and data, are combined with the exploration of cultural differences of others to further expand knowledge. This allows students to reflect on new concepts and open their minds to different approaches. Through the pedagogical strategies, students can also learn what approaches work best for them: Which learning activities and learning styles they tend to gravitate towards—and how to develop concepts and build mental models to further their learning—are all important elements to consider. Overall, active learning makes student engagement rise. Students get to participate in personalized teaching strategies, rather than being mere spectators and passive learners in the classroom.

Pedagogy has been evolving to better support 21st-century skills and ideas. The traditional classroom lecture is no longer as effective as it once was. Teaching has expanded to include new forms of learning, like interactive and collaborative projects and online and remote curricula, and to accommodate more flexible schedules. Real-world scenarios and cultural differences are being taken into account, affording students new ways to acquire, construct and organize their learning. Pedagogy is shifting focus beyond basic memorization and application of simple procedures to aiding students in higher-order learning, including critical thinking skills, effective communication, and greater autonomy.

Online learning has become a significant part of higher education. Any modern pedagogy must account for students finding, analyzing and applying knowledge from a growing number of online tools, platforms and sources. Higher-order skills, like critical thinking and the ability to learn more independently, as well as in larger groups, are essential for engaging in online learning in a meaningful way.

Students must be comfortable using technology to help them learn, and to access, share, and create useful information and gain better fluency in a subject. Educators, in turn, can use technology to enhance course materials and further support their pedagogies through blended learning that combines classrooms with online teaching, flipped classrooms that provide materials students can access after class, like videos, lecture notes, quizzes, and further readings, and overall wider access to sources and experts online. Teachers can integrate new forms of technology to teach, like videos, animations, and simulations through sources like YouTube channels, podcasts and clickers. Digital text books can incorporate content like video and audio clips, animations, and rich graphics that students can access and annotate. All of this content enhances the experience for students, and particularly benefits students who are struggling. It can also reduce spending since students have plenty of valuable, real-time updated information at their fingertips for free.

It's critical that what you're teaching students is relevant and meaningful, and personalised to suit their experiences. The increase in non-formal, self-directed learning methods means that students have more access to information than ever before. It makes it easier for educators to track their learning through digital activities. But it also requires more attention in guiding them to the right sources, adjusting lecture content and adopting approaches purpose-built for engagement and collaboration. In much innovative pedagogy, there's a power shared between educator and student. Students learn more independently, instead of following a set course of lectures and textbooks from an instructor. In many cases, students thrive in self-directed learning methods, while educators can use lecture time more effectively for discussion and collaborative work.

The educator, then, becomes a critical guide and assessor for students, linking them to accepted sources of information and emphasizing the importance of accreditation. They are no longer the only source of information, delivered in chunks via lectures. And this requires an overhaul of the strategy towards how student learning is achieved, monitored and assessed.

Conclusion

Pedagogies are constantly evolving. You can develop your own, inspired by common ones and modified for 21st-century learning. A pedagogy must fit your audience, and focus on helping students develop an understanding of the material beyond basic memorization and surface knowledge. Students should be able to relate concepts back to

the real world, and even their own lives. Every pedagogy is different. A good starting point is to create a **philosophy of teaching statement** that outlines your communication goals as an instructor, and how you plan to relate the work you do in the classroom to professional development once the student moves on to a career. Then, design classroom experiences around this philosophy, work with students to adapt methods to encourage positive responses and determine how you will evaluate and assess their performance. It's also worth considering how you will integrate technology into lesson plans and classwork, as well as promote inclusivity. Taking all of this into consideration makes for a great recipe for a successful pedagogical approach. The more aware you are of the way you are teaching, the better you'll understand what works best for your students.

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EdTech For Higher Education Institutions in India

Akhil Ravella[15]

Introduction

The Impact of technology on education in general and higher education in India has been significant in recent years. With the increasing availability of digital resources and online tools, how students learn, and teachers teach, has been transformed.

Technology has made education more accessible and affordable to students nationwide. With the rise of online courses and digital learning platforms, students can now access quality education from the comfort of their homes without the need to travel long distances or pay exorbitant fees. This has particularly benefited students living in remote or underdeveloped areas, who may have limited access to traditional educational institutions.

Technology has made education more interactive and engaging. With multimedia resources such as videos, animations, and simulations, teachers can present complex concepts more engagingly and visually. This helps students better understand the material and makes learning more enjoyable and memorable.

Technology has facilitated communication and collaboration between students and teachers. With email, instant messaging, and video conferencing tools, students can now easily communicate with their teachers and peers, regardless of their physical location. This has made learning more convenient and enabled students to work jointly on projects and assignments.

According to Kantar, around 31 per cent of the population in rural India uses the internet as opposed to 67 per cent of the country's urban population. Further, only one-fifth of the Indian population can operate a computer or use the internet and around nine per cent of students enrolled in any course had access to a computer with internet. Additionally, according to NSSO 2018 survey, just 25 per cent of enrolled students could access the internet through any sort of devices. (National Sample Survey Office (2018). According to Niti Ayog "[most] of the internet users are in urban educated classes. This situation reflects that majority of the Indians still remain unfazed by the information technology revolution. With such a disparity in digital access and literacy, it is hard to aspire for inclusion and equity…" Thus, we observe that while technology has made education more accessible to some students, many still lack the hardware, software, and internet connectivity to participate fully in digital learning, resulting in digital divide

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increasing inequality in terms of access and information to technology. To make the initiatives like Digital india impactful, it is important to pay attention to issues relating to "access" and effective "use" and not limiting to deploying digital technology alone.

Another challenge is the quality and credibility of online courses and degrees which has been on the rise as a measure to improve the GER. With the rise of online courses and degrees, there is a risk of diluting the quality and credibility of education. Therefore, it is essential to ensure that online courses and degrees meet the same standards as traditional educational institutions and are recognized by employers and universities.

EdTech has proliferated in technical streams like engineering, sciences stream etc., but has less presence in general degree streams. Government of India initiatives for improving access to quality education using ed-tech tools such as SWAYAM, NPTEL, National Digital Library etc., which develops material in all fields of higher education envisions to and encourages HEIs creating a more equitable and accessible educational system that prepares students for the 21st century.

What is Ed-Tech?

EdTech has a rich history dating back to the 1920s when governments introduced educational radio programs, challenging traditional learning. The 1960s saw the incorporation of television in schools, and the 1990s witnessed a surge in educational videos including the introduction of Edu Sat. Computer-aided learning emerged in the mid-20th century. Online courses gained momentum in the internet era. In India there are 17 open and distance Universities with more than 46 lakh students enrolled as per AISHE 2021-22 report. Pioneering institutions like the Indira Ghandhi National open University led innovations in the use of Ed-tech solutions and online interactive education. Today EdTech features advancements in multimedia, like online courses with virtual classrooms, and innovative tools like EdTech robots, AI and blockchain, shaping the future of education.

The term "Education Technology" can also be abbreviated as "Ed-Tech." Utilizing computers, computer programs, and educational systems, offers students, employees, and other users the opportunity to further their knowledge and receive training. Due to advancements in

areas such as video conferencing software and multimedia resources, Ed-Tech is now more accessible and effective than ever before.

EdTech is evolving with key trends:

- **Gamification:** Integrating gameplay into education to make learning enjoyable
- **Adaptive Learning:** Tailoring programs to individual student needs benefiting differently-abled students.
- **AR and VR:** Immersive experiences in augmented and virtual reality for enhancing learning
- **Redesigned Learning Spaces:** Personalized, tech-enabled classrooms with cloud technology.
- **Learning From Anywhere:** Breaking geographical barriers, allowing learning from any location with access to internet

Advantages Offered by Ed-Tech

EdTech enhances student's learning experiences by providing interactive and engaging tools for learning. Studies show that such an engagement with learning makes it more interesting for the learner and helps in better retention of information. Additionally, EdTech introduces complex subjects like coding and engineering at an early age, laying the foundation for valuable skills. Below are the advantages of incorporating EdTech into HEIs:

- Some pupils, for instance, learn best via reading, while others do better with visually presented materials. Thanks to Ed-Tech, students can get their education from wherever they feel will be most beneficial to them.
- Students who want to take their courses online often highlight the flexibility it provides in terms of when and where they can get their education.

- The ability to access online learning whenever convenient for the learner makes education and continuous professional training far more available to a wide range of people in a wide range of contexts
- Those who already have full-time jobs and would have a hard time fitting in traditional university lectures may benefit greatly from this option.

- It is possible to get a high-quality education online for far less money than it would cost to enrol at a university or even a local community college.
- EdTech supports teachers, Institution leaders and policy makers by providing insights into the student's progress, helping them revise and develop the curriculum, and evolving appropriate pedagogies and teaching learning strategies. Contrary to concerns about technology isolating people, EdTech fosters active stakeholder participation, creating an informed and supportive educational ecosystem.

The below seven educational goals represent the instructional and institutional outcomes enabled through technology and e-learning, according to SIIA Vision K-20 which works on EdTech policy:

i. Meet the personalized needs of all students
ii. Support accountability and inform instruction
iii. Deepen learning and motivate students
iv. Facilitate communication, connectivity and collaboration
v. Manage the education enterprise effectively and economically
vi. Enable students to learn from any place at any time
vii. Nurture creativity and self-expression

Below, five technology measures, meanwhile, may indicate progress for technology and e-learning implementation toward the educational goals:

i. Widely use 21st-century tools for teaching and learning
ii. Provide anytime/anywhere educational access
iii. Offer differentiated learning options and resources
iv. Employ technology-based assessment tools
v. Use technology to redesign and enable the enterprise support

Benefits of EdTech

Recent statistics shared by PwC mention that there will be three times the need in hiring for jobs that demand AI skills. With AI implementations in industries on the rise, the future of work is bound to change and adapt exponentially. This means the future workforce is even more inclined towards the changing dynamics of the job market. And to do that takes a lot of skill refining and being accustomed to the "learn, unlearn, and relearn" concept. Considering this, EdTech is moving towards a more holistic approach to bridge the skill gap by encouraging the next generation to upskill themselves through a formal educational degree, online certifications, or self-learning. Under such circumstances, digital skills are the very need for students who will be the main work force in years to come.

Students of all ages are benefiting from the increased learning opportunities provided by technology, which also promotes diversity and collaboration in the classroom. The benefits of Ed-Tech extend beyond students. Innovation in schooling is being seen by educators as a method for coming up with compelling showing techniques and diminishing class time. The following are the benefits for students and teachers:

Students	Teachers
Increased Collaboration: Tablets and cloud-based software are enabling students to work together more effectively in the homeroom. Cloud-based apps, on the other hand, let students upload their work and have virtual discussions about their ideas and get help from classmates without ever meeting in person.	**Automated Grading:** The utilization of computer-based intelligence-controlled instructive innovation makes reviewing a breeze. When used for more objective assignments like true/false or fill-in-the-blank tests, these technologies can save teachers a significant amount of time compared to manual grading. With more time off, educators can spend less time preparing lessons and more time working one-on-one with students of varying ability levels.
24/7 Access to Learning: IoT gadgets are making it simpler for understudies to take part completely in web-based study halls. Students can now do their schoolwork whenever and wherever they have access to Wi-Fi and the cloud through a connected device, not only while physically present in a classroom.	**Classroom Management Tools:** All aspects of classroom life, from teacher-student interactions to student conduct, stand to benefit from the increased use of technological tools. In addition to apps that help deliver reminders about projects or homework assignments, there are likewise advancements that permit understudies to self-screen study hall clamor levels. When management tools are used in the classroom, students learn in a setting that is less chaotic and more conducive to teamwork.
"Flipping" the Classroom: Ed-Tech is revolutionizing the way we think about teaching and learning in the classroom. In most cases, students first attend class to learn new material or listen to lectures, then go home to complete homework and other projects. Students can now hear lectures at home at their own leisure via learning applications and video lectures, freeing up class time for students to work on group projects together.	**Paperless Classrooms:** Moving to a paperless system makes it easier to grade work, reduces the time spent searching for and organizing students' hundreds of homework files, and promotes greener teaching methods.
Personalized Educational Experiences: Video content technologies allow students to grow at their natural speed and check their understanding of the topic by pausing and rewinding lectures. In order to help students who are having difficulty, teachers can use data analytics to determine which students are having problems and which lessons they are having trouble with.	**Eliminating Guesswork:** Teachers spend a lot of time trying to assess their pupils' strengths and opportunities for improvement. The use of educational technology has the potential to change everything. Today, educators may take advantage of a plethora of resources, including data platforms, apps, and tools, that continuously assess their students' abilities and tailor instruction accordingly.
Attention-Grabbing Lessons: Do you recall ever daydreaming or only half-listening in a class? With so many distractions in the classroom, including students' own electronic devices and the wider world, it's more important than ever to design lessons that are both interesting and useful. According to proponents of educational technology, the problem can be solved with the right tools and platforms.	

Government interventions in EdTech

There has been much emphasis given for use of technology in education, by the Government of India such as the launch of a comprehensive initiative called PM eVIDYA (2020), which unifies all efforts related to digital/online/on-air education to enable multi-mode access to education. The national educational policy (NEP), 2020 also emphasizes the effective use of innovation to improve teaching and learning for students through the use of technology. NEP, 2020 envisions creating an autonomous body, the National Educational Technology Forum, which will be the vehicle for integrating technology into different aspects of school education and higher education. The National Digital Education Architecture, under the Ministry of Education also has as its vision the creation of a "unified national digital infrastructureto energize and catalyze the education ecosystem." Essentially, this is a technological framework that aims to enable existing systems to upgrade and become interoperable, while making available, the common building blocks and services for the creation of new tools and solutions.

International Development Institutions like the United National Educational, Scientific and Cultural Organization's (UNESCO) Digital Competencies and Skills has student and teacher standards and OER Resources for countries to share and collaborate. Countries can take UNESCO's framework and, adapt the framework to their national curriculum, depending on the levels and needs such as for improving "information technology competency" "ethical behavior in the digital environment" and "communication and collaboration in the digital environment." etc. On the 75th Independence Day, the Prime Minister Sri. Narendra Modi declared from the Red Fort, "India's techade is here. With 5G, semiconductor manufacturing, andoptical fibres in villages, we are bringing a revolution through Digital India to the grassroots level." He stated that this will revolutionize the education and healthcare sector and bring about a noticeable change in the lives of the citizens.

One of the key initiatives launched in India is the National Education Policy 2020, which emphasizes the importance of technology in improving access, equity, and quality in higher education. The policy recognizes the potential of technology to enhance the learning experience for students and calls for integrating technology into the education system. The NEP 2020 aligns with an objective of achieving SDG 4 – "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (2030) target.

The government has launched several digital initiatives to support the adoption of technology in higher education. The SWAYAM platform, for example, offers online courses and degrees from Indian institutions, providing students with greater flexibility and accessibility.

The National Digital Library of India is another initiative launched by the government, which provides students and educators with access to a vast collection of digital resources, including books, journals, and research papers.

Recently, the Government has established National Educational Technology Forum (NETF), to implement and regulate a unified digital education architecture and fulfil the objectives of NEP 2020. This platform shall enable the free exchange of ideas pertaining to the use of technology to enhance learning, assessment, planning and administration etc. for School Education, Higher Education and Skilling Initiatives.

In addition, the government has also launched several initiatives to bridge the digital divide and improve internet connectivity in the country. The Digital India program, for example, aims to provide high-speed internet connectivity to every citizen of India.

Furthermore, the government has financially supported educational institutions to enhance their digital infrastructure and technology capabilities. The Rashtriya Uchchatar Shiksha Abhiyan (RUSA) is an initiative launched by the government to provide funding to universities and colleges to upgrade their infrastructure and facilities, including digital infrastructure.

E-Learning Initiatives by Govt. of India

In addition to the above initiatives taken by the Government of India, it has developed digital learning platforms to make it accessible to all the students in Higher Education to attain quality education and material at no cost/low cost. Below are the resources which can be utilized by HEIs and students:

Resource	Description	Objective	Link
SWAYAM	Massive Open Online Courses	The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.	https://swayam.gov.in/
SWAYAMPRABHA	Digital courses on TV	DTH channels bringing quality education from leading and professors directly to your home, completely free of cost.	https://swayamprabha.gov.in/

Resource	Description	Objective	Link
National Digital Library	E-content on multiple disciplines	National Digital Library of India (NDLI) is a virtual repository of learning resources which is not just a repository with search/browse facilities but provides a host of services for the learner communit	https://ndl.iitkgp.ac.in/
e-PG Pathasala	Free e-books and curriculum based e-content	High quality, curriculum-based, interactive e-content in 70 subjects across all disciplines of social sciences, arts, fine arts and humanities, natural & mathematical sciences, linguistics and languages have been developed by the subject experts working in Indian universities and other R & D institutes across the country.	https://epgp.inflibnet.ac.in/Home
e-Yantra	Hands-on-experience on embedded systems	The goal is to harness the talent of young engineers to solve problems using technology across a variety of domains such as: agriculture, manufacturing, defence, home, smart-city maintenance and service industries	https://www.e-yantra.org/
FOSSEE	Free/Libre and Open Source Software for Education	We aim to reduce dependency on proprietary software in educational institutions. We encourage the use of FLOSS tools through various activities to ensure commercial software is replaced by equivalent FLOSS tools. We also develop new FLOSS tools and upgrade existing tools to meet requirements in academia and research.	https://fossee.in/

Resource	Description	Objective	Link
Spoken Tutorial	Self-training in IT Fields	The main objective of this project is to promote IT literacy for education and improve the employment potential of learners in India, using FOSS (free and open source software).	https://spoken-tutorial.org/
Virtual Labs	Curriculum based lab experiments	Virtual Labs do not require any additional infrastructural setup for conducting experiments at user premises. experiments can be accessed remotely via internet.	https://www.vlab.co.in/

EdTech landscape in India

Value Chain

	Higher Education
Content	E-book Publishers
	Digital Curriculum providers
Management	Analytics Platform
	Alumni engagement
	Campus Management Software
Non-Academic Operations	Online degree enablers
	Lead generation and marketing automation
	Digital Admission and Fee collection
	Education Finance
	Talent Management and career counselling
	Administration and Human Resources Management
Assessment and Testing	LMS for Academies
	Video platform management
	LMS solution providers
	Online proctoring
	Reskilling and online certification
	Performance Assessment Software
Distribution	Test Prep
Aggregators/apps	MOOCs
	Teacher Training
	Language and casual learning platform

The activities highlighted in purple i.e., reskilling and online certification, are predominantly used in the higher education sector as per KPMG report. The rest of the activities are yet to be integrated into the mainstream of utilising EdTech to its potential, and there is a need to integrate all the other activities for the learning and teaching development of teachers, educators and institutions.

Best Practices: A case of MIER College of Education, Jammu

Objectives:

- To empower the faculty and teacher trainees in the use of ICT tools
- Use of digital content to enrich classroom teaching
- To develop innovative evaluation techniques

Context:

Use of information and communication technology (ICT) has played a pivotal role in empowering the teacher trainees in the use of modern-day information tools. The teacher trainees have not only to be trained in the skills of conventional classroom teaching but they have also to be trained in the use of modern educational technology, especially the use of ICT tools to improve the overall teaching-learning experience. This will help them to become the teachers of the 21st century in the real sense.

Initiatives:

Teaching-Learning **-** The college has introduced ICT-based subjects at various levels, including B.Ed., B.Ed. Spl. Education, M.Ed., and MA. The college has adopted Google Classroom for online teaching and has shifted to online platforms during the Covid-19 lockdown. Faculty members have computer-training and are knowledgeable about educational technology. Student teachers use ICT extensively in their teaching and learning situations. The college uses broadband internet facilities, online webinars, panel discussions, workshops, and MOOCS. Video recording of teaching practice sessions is used for feedback. Students are exposed to e-learning resources through library and ICT classes.The college has introduced ICT-based courses across all programmes being offered.

Evaluation **-** ICT plays a crucial role in the assessment and evaluation process at the college. Question papers are prepared and printed using modern software. The college's ERP facilitates examination enrollment, evaluation methods, and mark calculations. Open book exams and online quizzes are conducted. PI360 analytic software, developed by MIET, is used for faculty and student performance assessment. It generates consolidated reports

on key indicators and provides students with transparent feedback. This helps motivate them to enhance their performance.

Evidence of Success - The college was awarded the "Tech Savvy Higher Education Institution in India" at the EdTechReview 2020 Conference for its digital initiatives in teaching, learning, and assessment. The college's ICT usage case study was published in the Wheebox New Code of Education 2021 Awards. The Australian government granted an innovation patent on the "Method to Study Impact of Online Classroom Platform Learning and Collaboration at Teacher Education Level." ICT has improved teacher trainees' teaching skills and confidence, enabling them to work independently and collect the latest information for presentations, seminars, project works, dissertations, and lesson plan preparation. The faculty has created an effective learning environment, adapting teaching methods, course design, and evaluation systems to meet globalization and educational improvement challenges. Over 300 recorded lectures have been uploaded for students, and 1140 papers were evaluated online in 2020-21 and 850 in 2019-20. Overall, ICT tools have made the teaching-learning process highly effective, evolved, and transformational.

Future Course of Action for HEIs in EdTech in India

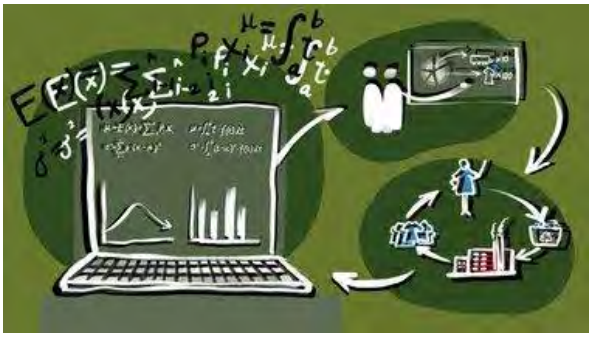
Standards or competencies provide the foundation, but it's teachers who put them into practice. Those practices can vary from classroom to classroom but having shared standards/competencies/frameworks is important as it helps with implementation. If there are no shared definitions, values and goals, well-meaning EdTech initiatives will stay siloed or not even get off the ground. So it is everyone's responsibility to prioritize, make appropriate provision for funding, train staff and advocate the benefits. Implementation is hard, long-term work. It's not just an event but a daily practice by teachers and students. Below is the approach to be undertaken by HEIs:

- Be open to digital transformation, which is inevitable.
- Build robust infrastructure, including both physical and digital platforms.
- Usage of Government e-learning and EdTech platforms, partner with EdTech companies etc.
- Ability to work at interface between traditional disciplines.
- Inculcate a habit of lifelong learning in the students as well as teachers.

- Focus on aspects important to students (e.g. placements) under digital transformation.
- Train faculty.
- Understand the implications of the NEP, strategise and re-strategise in order to adapt it.
- Tie up with other reputed institutes to offer parallel supplementary online degree programmes/courses, and flexibility of integrating SWAYAM courses in student Academic Bank of Credits.
- Conduct remote industry connect and online mentorship programmes.
- Introduce and connect students to an interactive, modular, manageable and user-friendly online learning platform with rich and quality content.

Conclusion

The integration of Educational Technology (EdTech) within India's higher education institutions signifies a pivotal shift towards modernizing the academic landscape. This brief highlights the transformative impact of EdTech in enhancing pedagogical methodologies and learning experiences. The successful development of Ed-tech tools will impact our future in every aspect. Accessible, effective solutions empower students and teachers in the classroom, enhancing learning. Improved instructional technology enables them to do more, enhancing the learning process and global education quality for young people. For students, EdTech democratizes access to high-quality education through platforms such as SWAYAM and the National Digital Library of India, thus mitigating the digital divide and promoting inclusivity. These platforms offer extensive resources that facilitate interactive and personalized learning, preparing students for the digital era. Concurrently, EdTech equips educators with advanced tools and innovative methodologies, enabling them to enhance classroom instruction, streamline assessments, and boost student engagement. Emerging EdTech tools help educators organize curricula and engage students in both classroom and blended learning. This sets young people up for success beyond the classroom, providing all necessary materials. The utilization of Learning Management Systems (LMS), digital content, and analytics platforms allows educators to tailor their teaching strategies to diverse student needs, thereby improving educational outcomes. These future leaders require the best instructional materials to excel. Ensuring their preparation secures a brighter future for all and addresses the challenges the next generation faces.



For higher education institutions, embracing EdTech is imperative to maintain competitiveness and relevance in an evolving educational landscape. It is imperative to

invest in robust digital infrastructure, integrate and link credit transfers from e-learning platforms to Academic Bank of Credits, foster partnerships with EdTech companies, and ensure continuous faculty development in leveraging technological advancements. Initiatives such as the National Education Policy 2020 and the National Educational Technology Forum (NETF) provide a strategic framework for the effective and sustainable integration of technology in education. The collaborative effort of all stakeholders—students, educators, and institutions—is essential for the successful adoption of EdTech. By fostering a culture of innovation, investing in digital infrastructure, and embracing governmental initiatives, India's higher education sector can achieve enhanced access, equity, and quality, thereby contributing significantly to the nation's educational and economic advancement.

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Drafting an Institutional Development Framework: Strategic Plan for the 2024-2034 Period in alignment with the National Education Policy of 2020

Dr. Aloysius Sequeira[16]

Executive summary

The following text presents a comprehensive approach to developing a strategic plan for educational institutions based on established scientific theories. The strategic plan responds to the National Education Policy 2020 announced by the Ministry of Education, Government of India, and is tailored to the unique characteristics of the institute. The aim is to position the institution as a leading national or international institute, focusing on academic excellence and social responsibility.

In developing the strategic plan, it is essential to engage all stakeholders in defining the vision and mission of the institution. Strategic goals should emphasize investment in people, development opportunities, and the necessary infrastructure to achieve educational objectives. These goals are identified through a thorough SWOT analysis, leading to establishing short-term (one to three years), medium up to 7 years, and long-term (up to 10 years) goals. Key performance areas (KPAs) are determined for each goal, with corresponding key performance indicators (KPIs) to track progress. Strategies and action plans are then developed to achieve the identified KPIs.

Implementation, monitoring, and control activities are conducted at the department and institute levels, with dedicated committees overseeing these efforts. Additionally, approval from competent authorities is necessary to secure the required budget for procuring equipment and establishing the outlined infrastructure as part of the Strategic Plan.

Introduction

The history of the institution's development and its role in nurturing proficient engineers and scientists contributing to various sectors of society has been notable since its establishment may be highlighted. Mention that Alumni involvement has significantly contributed to their remarkable achievements, enhancing the institution's reputation. Declare that unwavering dedication, commitment, and drive of the students, faculty, and staff, supported by the visionary leadership of past and current institution leaders, have been instrumental in the institution's success.

[16] Dr. Aloysious Sequeira: a Professor at Higher Administrative Grade (retd.), Former Dean (Faculty Welfare), NIT Suratkal.

Emphasize that in today's rapidly evolving world, institutions face new challenges daily as change remains the only constant. Resources are depleting faster than during the institution's early stages, while stakeholder expectations continue to rise, necessitating enhanced performance. A well-structured strategic plan is essential to empower the institution to navigate the dynamic environment and limitations of resources effectively.

Vision Statement

Vision is the starting point for expressing a company's hierarchy of goals. It is often described as a massively inspiring, overarching, and long-term goal. A vision represents a destination that is driven by and invokes passion. Essentially, vision is a dream to become, a desired future, hazy and vague, yet a powerful motivator. It provides a panoramic view of where we are going and serves as a roadmap showing the route an organization intends to take in developing and strengthening its business. Vision is like a North Star, guiding us toward our desired destination. It helps steer the energies and motivation of personnel of the organization in a common direction, as seen with Henry Ford's vision of a "car in every garage," which was decisive in capturing the imagination of all.

Essential characteristics of the vision statement may include, as shown in the Figure below:

Examples-Vision Statement

- *To contribute to India and the World through excellence in scientific and technical education and research; to serve as a valuable resource for industry and society; and remain a source of pride for all Indians(IIT-D)*

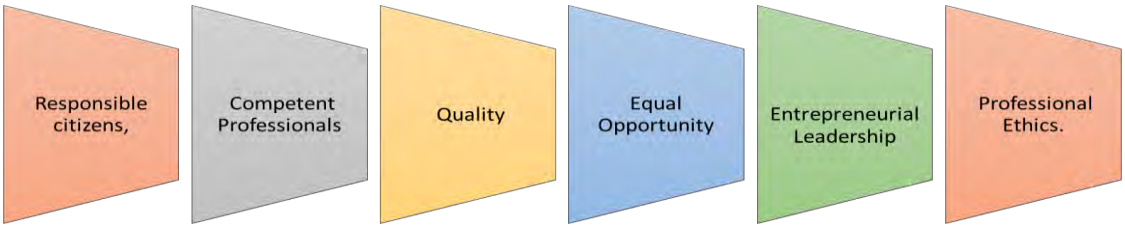
- *To ensure that by 2030, every student will have a global learning experience during their time at Mizzou, both on campus (or domestically) and abroad(University of Missouri)*

- *To advance innovation, knowledge, and collaboration among students with a commitment to build their eminence and enable them to become responsible citizens, competent professionals, and caring individuals equipped to succeed in a globally competitive economy*
  *(*proposed in Strategic Plan 2020-35 NITK, Surathkal)*

Core values

The foundation of any robust vision is the organization's core ideology, which comprises core values and purpose. Core values are a set of guiding principles and beliefs, while the core purpose is the most fundamental reason for the organization's existence. These values form the basis of an institution, directing its operations, decision-making processes, and interactions with its members and stakeholders.

Organizations typically have a small number of core values, ranging from three to seven. Some essential core values for a professional educational institution may include, as indicated in Figure :



Mission statement

The mission statement serves as the second level of strategic intent and defines what an organization is and why it exists. It encompasses the purpose of the company, its basis of competition, and its competitive advantage. Unlike vision statements, mission statements can change based on evolving competitive conditions and new threats or opportunities.

Critical Questions for Developing a Mission Statement:

1. What is our business type?

2. What expertise does our company possess?

3. How will we achieve our grand vision?

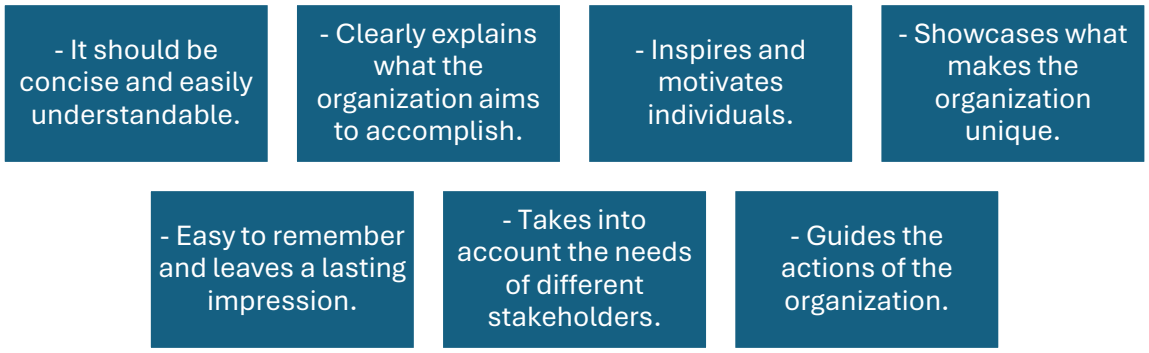
4. What products and services do we develop and provide?

5. How and where do we serve our customers?

6. What sets our business apart from competitors?

7. What impact do we aim to achieve?

Characteristics of a well-crafted mission statement are indicated in Figure :



Examples- Mission Statement :

University of Missouri

- We provide transformative global learning experiences for students that support:

- Academic success: Students reach their academic goals, develop academic persistence, and accelerate their degree completion.
- Leadership development: Students discover their personal voices and full potential as leaders.
- Career exploration: Students develop professionally to maximize their opportunities for competitive employment in the 21st-century global workforce.
- Intercultural proficiency: Students gain deep understanding, respect, and appreciation for all cultures.
- Global citizenship: Students prepare for lifelong service to their local communities and the world.

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- To generate new knowledge by engaging in cutting-edge research and to promote academic growth by offering state-of-the-art undergraduate, postgraduate, and doctoral programs.
- To identify, based on an informed perception of Indian, regional, and global needs, areas of specialization upon which the institute can concentrate.
- To undertake collaborative projects which offer opportunities for long-term interaction with academia and industry.
- To develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in various professions.

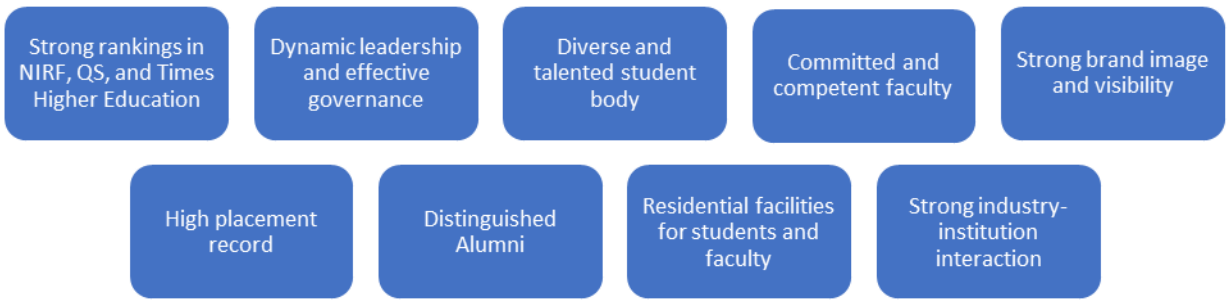
NITK Surathkal*

- Impart quality education to meet the profession's and society's changing needs and continuously improve and achieve excellence in teaching and research.
- Foster and encourage a culture of integrity, self-reliance, and entrepreneurial leadership in an environment conducive to attracting talent, promoting creativity, and advancing collaboration.
- We are dedicated to nurturing and building a culture of openness among faculty and students and promoting networking with alums, industries, institutions, and other stakeholders.
- Practice and adhere to high standards of personal & professional ethics, transparency, and accountability in all relationships- personal & professional."
  (*proposed in Strategic Plan 2020-35)

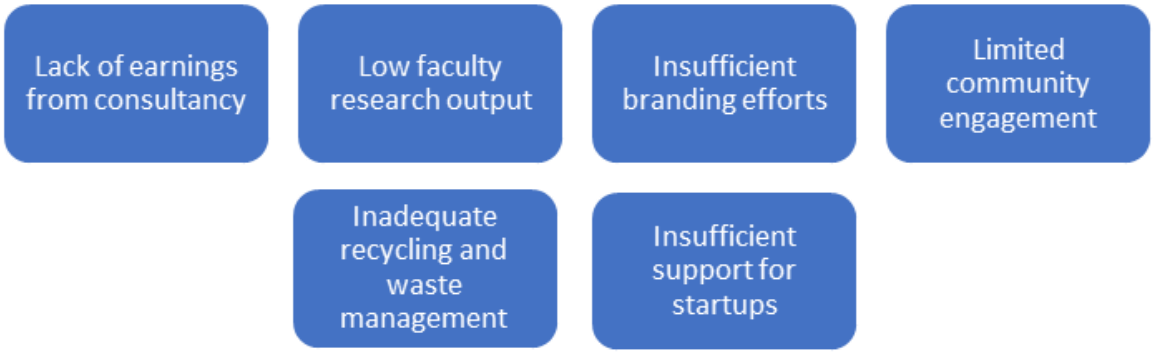
In-depth Strategic Analysis

Strategic Analysis involves proactively diagnosing an institution's external and internal environment to develop strategies that align with market needs, organizational capabilities, resources, and performance. The SWOT (strengths, weaknesses, opportunities, threats) analysis tool is commonly used. It identifies internal factors to leverage strengths and mitigate weaknesses while considering the complex and dynamic external environment, which presents opportunities and threats leading to uncertainty and risk for the organization. This analysis informs the formulation of straightforward strategies to leverage strengths, address weaknesses, capitalize on opportunities, and mitigate threats to make the organization proactive, competitive, and progressive in achieving its vision and mission.

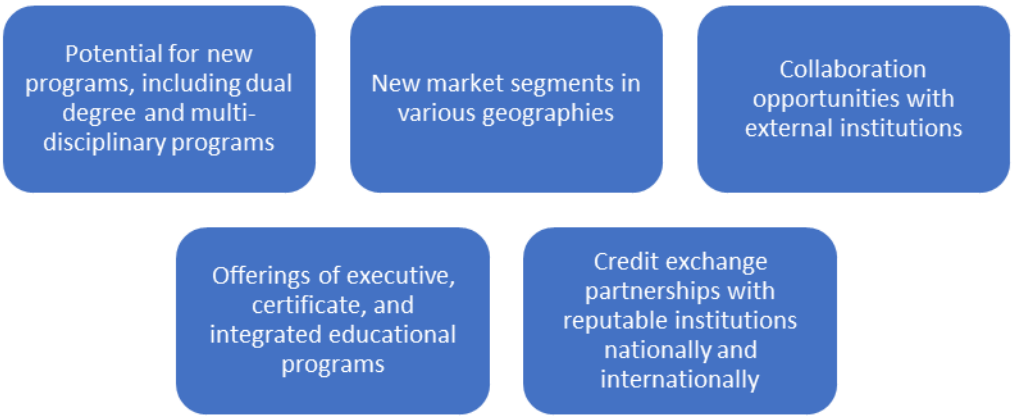
Strengths (few examples)



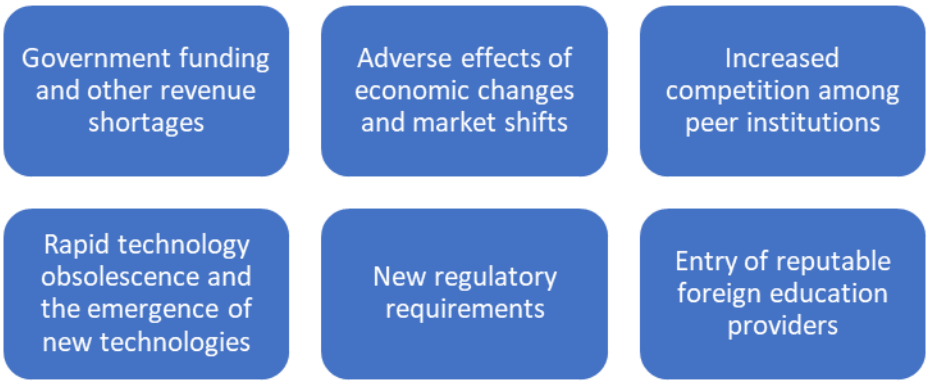
Weaknesses (few examples)



Opportunities (few examples)



Threats (few examples)



Strategic Goals, Strategies, and Action Plans

To achieve the vision and mission of the Institute, strategic goals are identified after conducting an intensive SWOT analysis. The strategic goals are broadly categorized on timeframe: short to medium term -3-7 years & long-term -10 years to be achieved over ten years.

Potential strategic goals may include:

Goals are measurable results or targets that must be achieved within a given period. A strategy is an action that is to be taken to attain one or more of the organization's goals. Each goal may have one or more Key Performance Areas (KPAs), sometimes called Critical Success Factors or Key Result Areas. These are strategic factors either internal to the organization/department or external. KPA is primarily qualitative and determines the areas that can help attain high value for the organization/department.

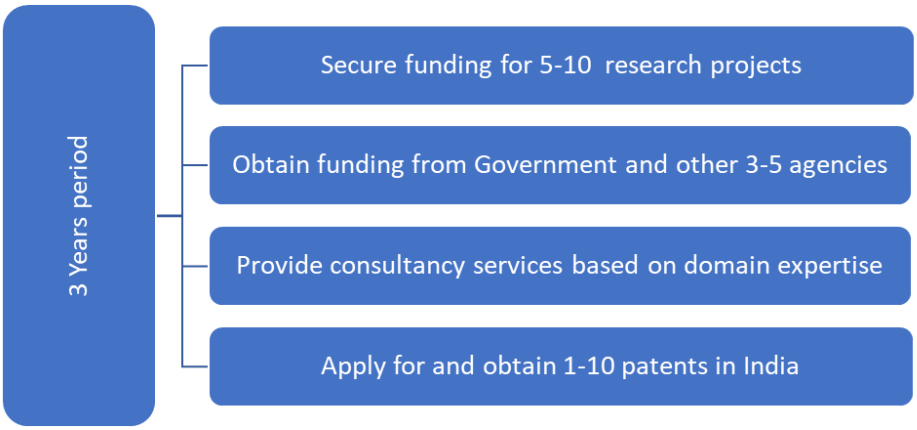
On the other hand, Key Performance Indicators (KPIs) are measures or metrics for one particular factor in KPA that give an "indication" as to whether the organization/department is progressing towards achieving that specific factor /objective in KPA.

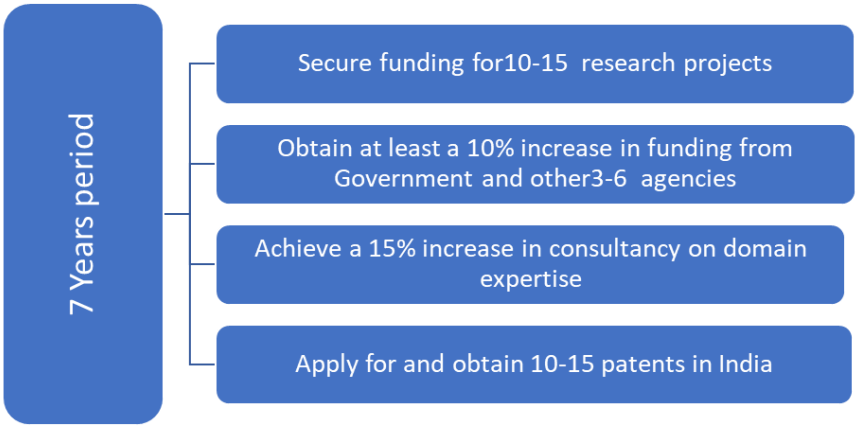
Once the KPAs are identified, appropriate strategies and KPIs are identified and realized during the proposal period.

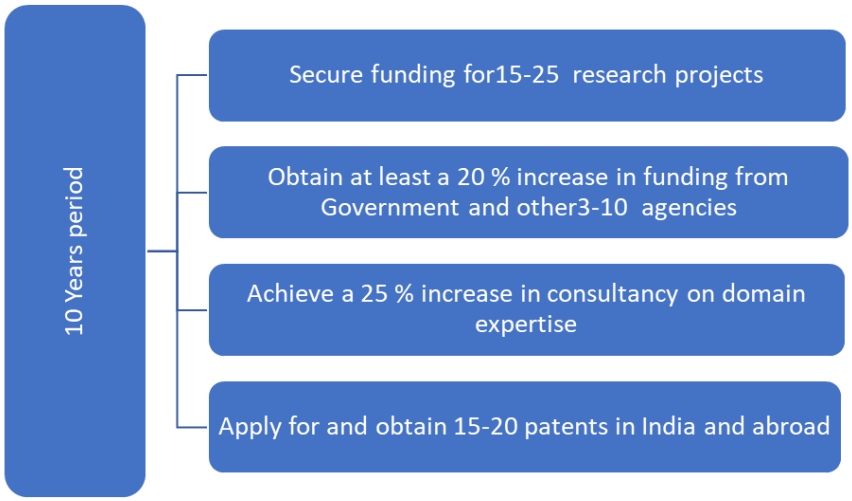
Key Performance Areas (KPAs) & Strategies

Key Performance Areas (KPAs) and Strategies must be identified for 3, 7, and 10 years,

Example: **Enhance Excellence in Research and Consultancy.**

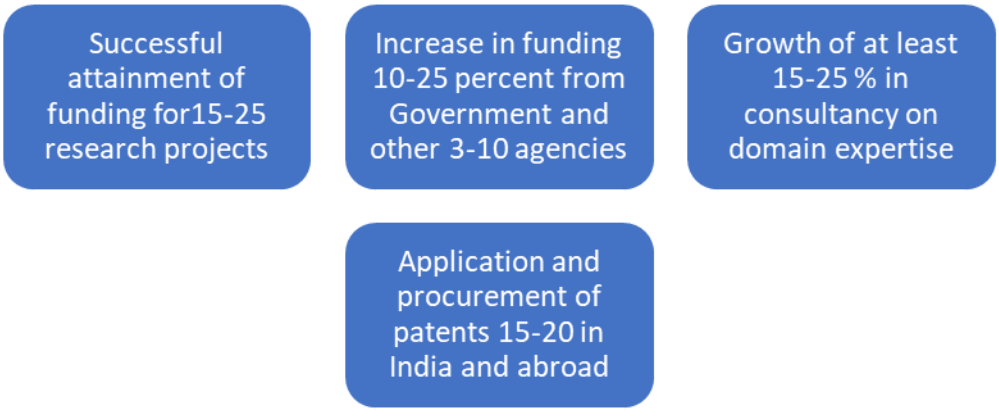






Performance Indicators

For each of the 3, 7, and 10-year time frames, we aim to achieve the following performance indicators:



ACTION PLAN: INSTITUTIONAL LEVEL

An example of an action plan created at the institutional and department levels, outlining the necessary steps to achieve overall goals, responsibilities, and the timeline for implementation, is presented in the table below. This template can also be utilized to develop action plans for various performance areas against each strategic goal, as outlined in Chapter 3.

Example-Action plan: Institutional level.

What (Actions)	Who (Responsibility)	When (Schedule)
Governance and Organization	Board, Director, Dy. Director, Deans	Continuous
Teaching-learning process	Senate, Academic Council, Dean, HODs & Faculty	Continuous
Financial Management	Director, Finance Committee, Finance Officers	Continuous
Infrastructure management	Dean, Building & Works Committee, Resident Engineer, System Manager,	Continuous
Quality Assurance	Director, Deans, HODs	Continuous
Research	Deans, HODs, Faculty, Research coordinators, others	Continuous
Students Welfare	Dean, Wardens, Students activity and Sports officers, others	Continuous

Action Plan: Departmental Level

What (Activities)	Who (Responsibility)	When (Schedule)
Enriching the curriculum based on responsiveness to students' needs and the needs of industry	Dept. UG /PG Committee	Once in 2 years
Publication output	Faculty	Continuous

Guidance of Research Scholars	Research Guides	Continuous
Research Funds	Faculty	Continuous
Short Term Training programs and Executive Development Programs	Faculty	Continuous
Service to the Community and offering professional advice to local bodies; at least two activities per annum	Faculty and non-teaching staff	Continuous
Interactive Meets with Alumni and Industry	Faculty	Continuous

Implementation, Monitoring, and Control

Implementing a Strategic Plan involves developing action plans and identifying the resources required to achieve the outlined goals. This includes assessing the infrastructure and human resources needed at institutional and departmental levels. After determining the short and long-term goals and their resource requirements, a comprehensive financial plan is presented to the relevant authorities for approval.

Critical steps in the implementation process include restructuring the institution to facilitate governance, teaching, learning, and research, allocating ample resources to essential strategic activities, establishing policies that support strategic initiatives, implementing effective policies and programs for ongoing improvement, tying the reward system to goal achievement, and demonstrating strategic leadership.

Monitoring committees are established at departmental and institutional levels to oversee performance in various goal areas and ensure progress.

Financial resources are secured through interventions by boards of governors and finance committees, submissions of proposals to various agencies, alum sponsorships and donations, faculty involvement in research and development, testing, and consultancy, as well as support from industry through sponsorships, donations, and chairs of excellence.

Conclusion

The evolution of institutions has experienced substantial development and transformation over the past few years. This transformation has been driven by various global and national factors such as globalization, liberalization, and privatization. Implementing the New Education Policy 2020 has significantly influenced the educational landscape, motivating all the stakeholders to comprehend the framework and the associated reforms.

As a result of these transformations, there has been a notable shift in stakeholders' expectations. External and internal factors, including demographic shifts, technological advancements, socioeconomic changes, cultural influences, legal aspects, and global dynamics, have impacted the institute. Internal changes in the profiles and expectations of critical stakeholders such as students, faculty, and staff have also been affected.

The Strategic Plan encompasses unique features and involves a systematic and comprehensive approach to strategic change, with active participation from stakeholders. The majority of the input for the Strategic Plan has been provided by internal stakeholders, making the strategic planning process genuinely participative.

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**The author acknowledges with gratitude the valuable inputs from the Strategic Plan Committee at NITK, Surathkal, during the collaborative work.*

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How to prepare an Institutional Development Plan (IDP)? An introduction

Surbhi Kak[17]

What is an IDP?

According to the National Education Policy 2020, quality higher education must aim to develop good, thoughtful, well-rounded, and creative individuals. It must enable an individual to study one or more specialised areas of interest at a deep level, and develop character, ethical and constitutional values, intellectual curiosity, scientific temper, creativity, spirit of service, and 21st century capabilities across a range of disciplines. While the policy has envisaged a holistic, well-rounded outcome of studying at an educational institution, the reality is far from ideal. Here, the role of an Institutional Development Plan (IDP) becomes paramount. ***As the name suggests it is a strategic document prepared to constantly upgrade and develop an institution to ensure sustainable quality education.***

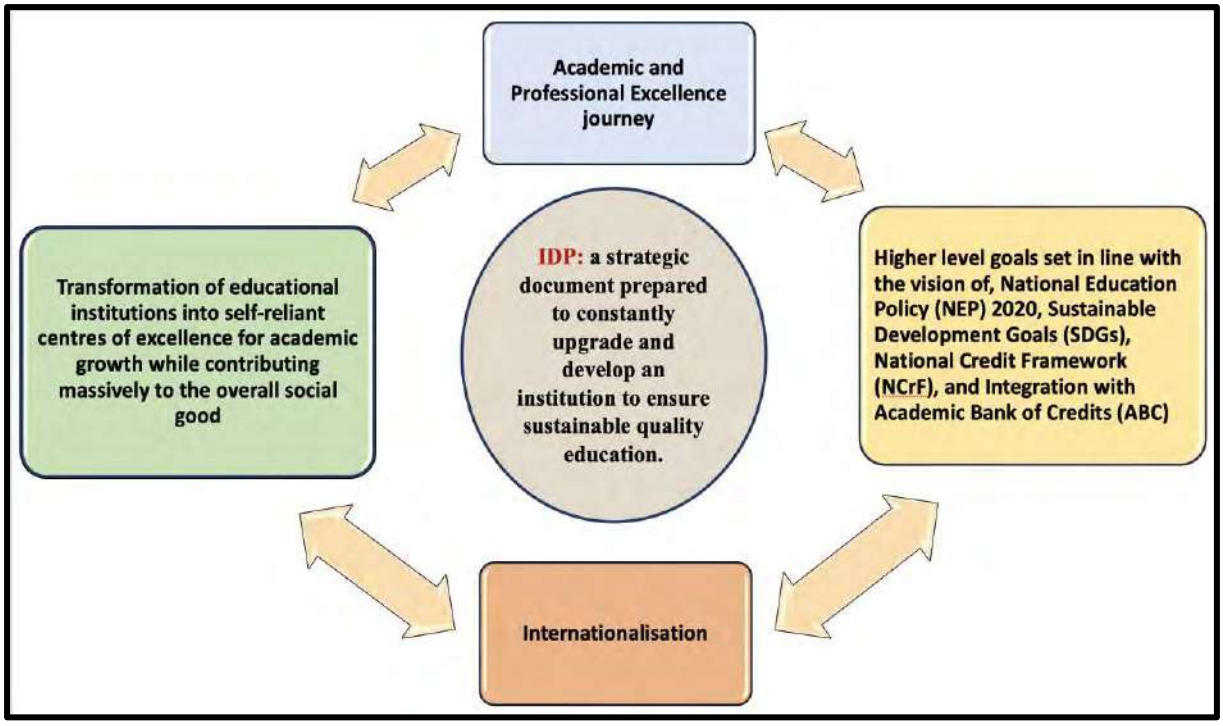
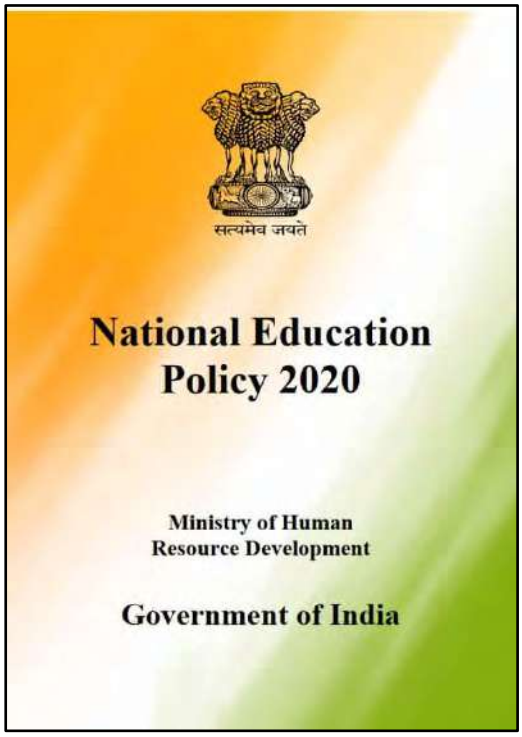


Figure 1: Factors linked to an Institutional Development Plan

[17] **Surbhi Kak:** is a Fellow working at Centre for Research in Schemes and Policies

The National Education Policy (NEP) 2020 mandate for preparing an IDP

The National Education Policy 2020 has accorded a lot of value to the preparation of IDP and mentions the plan document at various junctures. According to NEP 2020 a comprehensive
IDP will have to be prepared by each institution, integrating its academic plans, including curricular improvement and classroom quality. The IDP will emphasize holistic student development and establish robust internal systems to support diverse student groups in both academic and social contexts. For instance, all Higher Education Institutions (HEIs) will provide mechanisms and opportunities for student-organized, topic-centred clubs and activities with faculty and expert assistance. Over time, these activities could become part of the curriculum once sufficient faculty expertise and student interest are developed. Faculty will be trained to mentor and guide students, beyond traditional teaching roles.



Performance assessment systems for tenure, promotion, salary increases, and recognition will be established by each HEI and detailed in their IDP. These systems will include peer and student reviews, teaching innovations, research quality, professional development, and service to the institution and community.

The IDP will include plans to increase participation from socio-economically disadvantaged groups by integrating necessary actions to provide opportunity costs, financial aid, and outreach on higher education opportunities. They will make admissions and curricula more inclusive, enhance employability, offer courses in Indian languages, ensure accessibility, provide bridge courses for disadvantaged students, and offer socio-emotional and academic support. Sensitization on gender-identity issues and strict anti-discrimination enforcement will be mandatory.

As per **NEP 2020, by 2035, HEIs must aim to achieve top accreditation and function as self-governing, degree-granting institutions.** The IDP, **created with input from key stakeholders such as board members, institutional leaders, faculty, students, and staff**, will **guide the institution** towards **achieving this goal.**

What is a relevant IDP?

A relevant IDP should contextualise and establish policies and structures to provide a guidance map to the administration and faculty with the goal of ensuring that students become more effective, independent and confident learners.

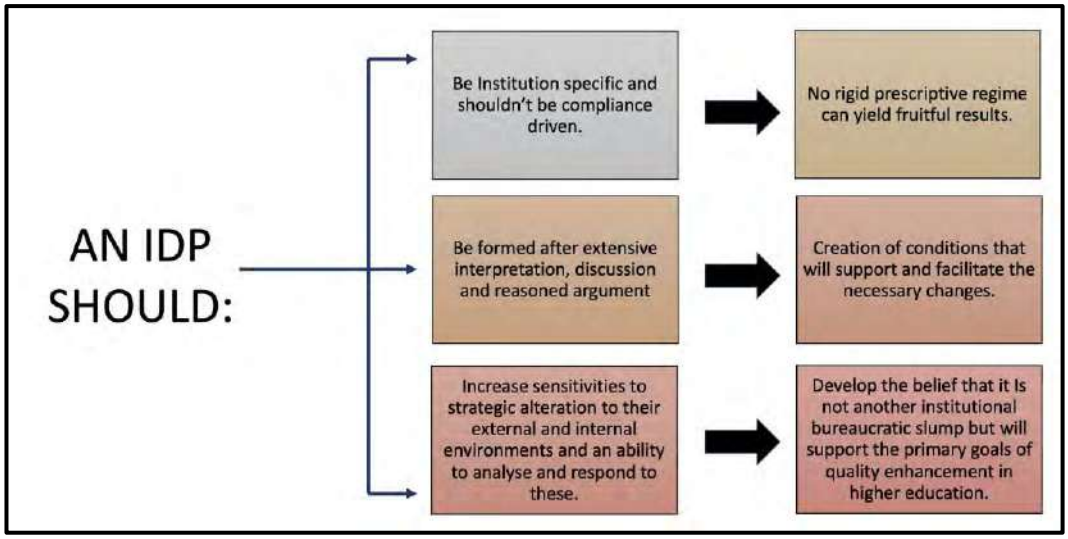


Figure 2: Aspects of a relevant IDP

Role of IDPs in institutional development

Each institution is unique in terms of its: **vision and mission, context, life cycle, location, character, and aspirations.** Thus, the challenges faced by different institutions are also diverse in nature and need to be addressed accordingly. Why any institution must have an IDP is enshrined in the main goals and objectives of the plan document. These have been enumerated below:

Figure 3: Main goals and objectives of an IDP

Stages of IDP development

Step 1: The first step is pondering over the vision, mission, and objectives based on current available information and perception. This should be followed by **a discussion on relevant strategies** on how to get there involving relevant stakeholders. This stage deals with the **broad purposes and objectives** of an organisation. It is important to keep in mind that the **goals and broad assumptions go from the top down**, **but the detailed plans come from the bottom up.** Just as research begins with forming a hypothesis based on current understanding, developing an IDP starts with gathering various ideas. **This initial stage is crucial; it involves accumulating insights and perspectives.** Following this, steps are taken to strengthen and refine these ideas, much like developing robust strategies to support and validate a research hypothesis.

The following figure depicts the steps that need to be followed post the initial discussion has taken place.

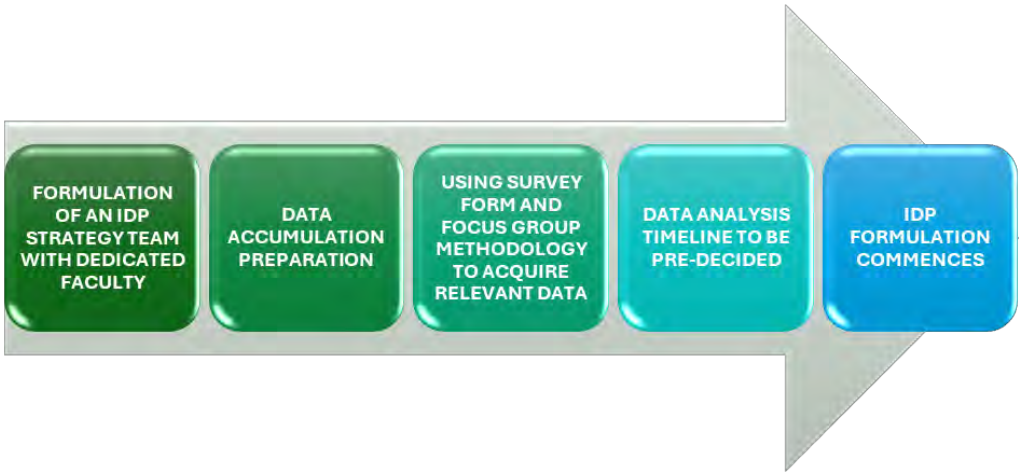


Figure 4: Steps to be followed to prepare an IDP

Step 2: Formulation of an IDP strategy team

An IDP strategy team can be considered as an amalgamation of appointed faculty and staff that will be dedicated towards the various activities involved in the pre-preparation, preparation, and monitoring phases of an IDP.

This strategy team may consist of the following:

- Internal Quality Assurance Cell (IQAC) members: The IQAC is a cell setup within an institution in the context of NAAC accreditation. Its members include the head of the institution, senior administrative officers, faculty Members, external experts, nominees from local Society, alumni, student Representatives, and the IQAC Coordinator. By already being part of this cell, these individuals are engaged in the quality assurance processes of the institution.

- Identified champions: A champion is an individual who is internal to an organization with an intrinsic interest and commitment to implementing change. He/she works diligently and relentlessly to drive implementation and has the strength of conviction. Identifying champions is a good way of ensuring the sustainability of a project. Moreover, when such individuals are highlighted for their formal or informal contribution, their motivation and dedication for on-ground implementation multiplies.

Step 3: Setting a Systems Design in place

The IDP strategy team is then divided into three groups based on responsibilities associated with maintaining the Information System, Planning System, and Control System. The following figure depicts the functions of the three systems. These three arms are important for ease of functionality and increased accountability. The exact number of members

appointed in each system can be decided internally based on the contextual realities of the institution.

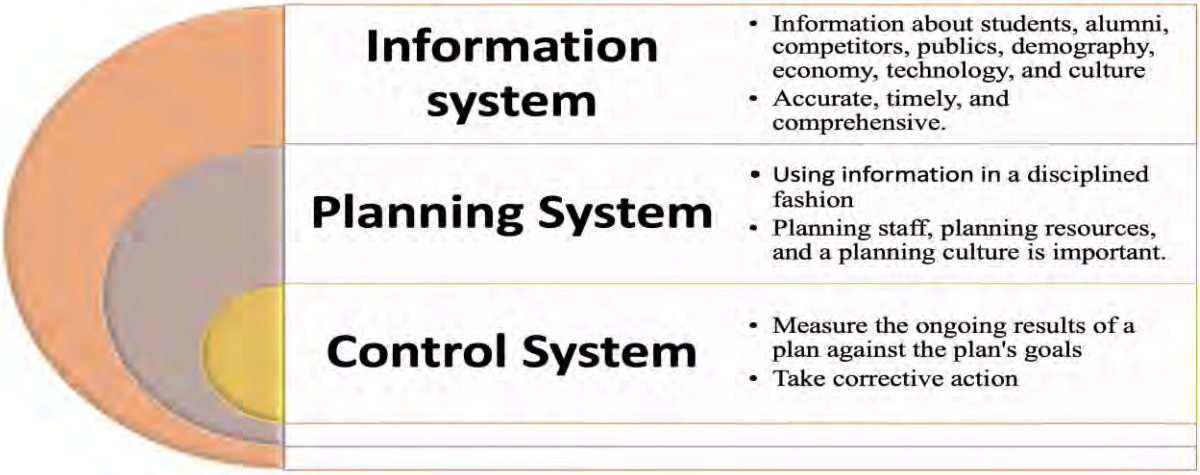


Figure 4: Strategic Planning System

Step 4: Data Accumulation and Preparation

The group dedicated to collecting data may use methods such as surveys and focus group discussions. This stage is crucial and will determine whether the IDP will be robust and pragmatic or weak and superficial. This step should be implemented as a strict time bound process.

The following table depicts the various areas that have been highlighted by the University Grants Commission to assist institutions for collecting data and developing their future courses of action.

S.NO	OVERARCHING AREAS TO BE ASSESSESED
1.	Physical infrastructure
2.	Digital Infrastructure
3.	Academic Infrastructure
4.	Research and Intellectual Property Infrastructure
5.	Supportive And Facilitative Infrastructure
6.	Infrastructure for networking and collaborations
7.	Governance Infrastructure
8.	Financial Infrastructure and Funding Models

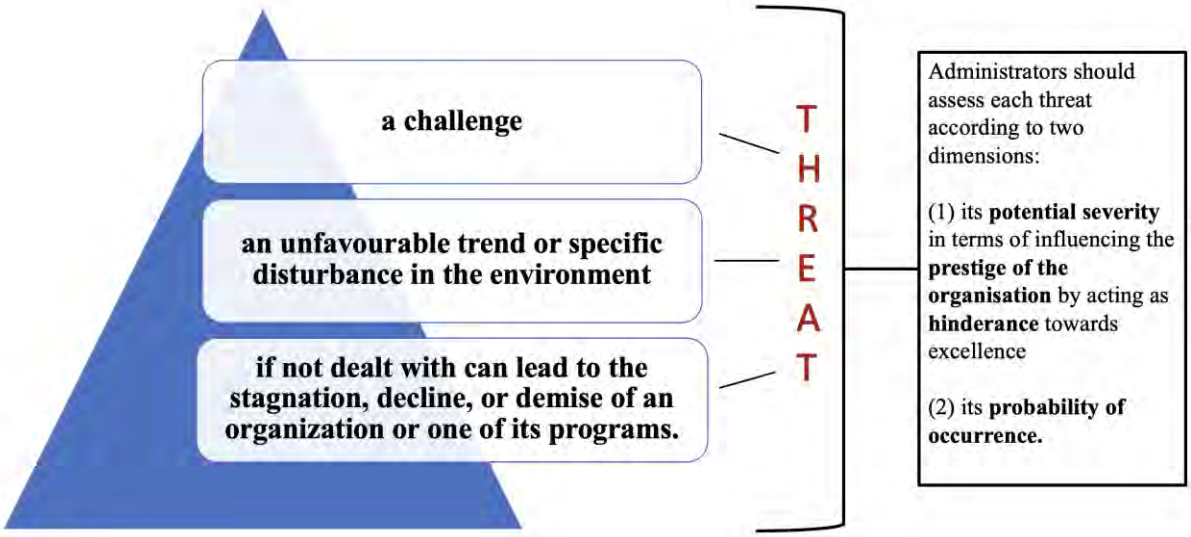
(The link for the detailed version of this document has been included in the **Appendix**)

Step 5: Data Analysis

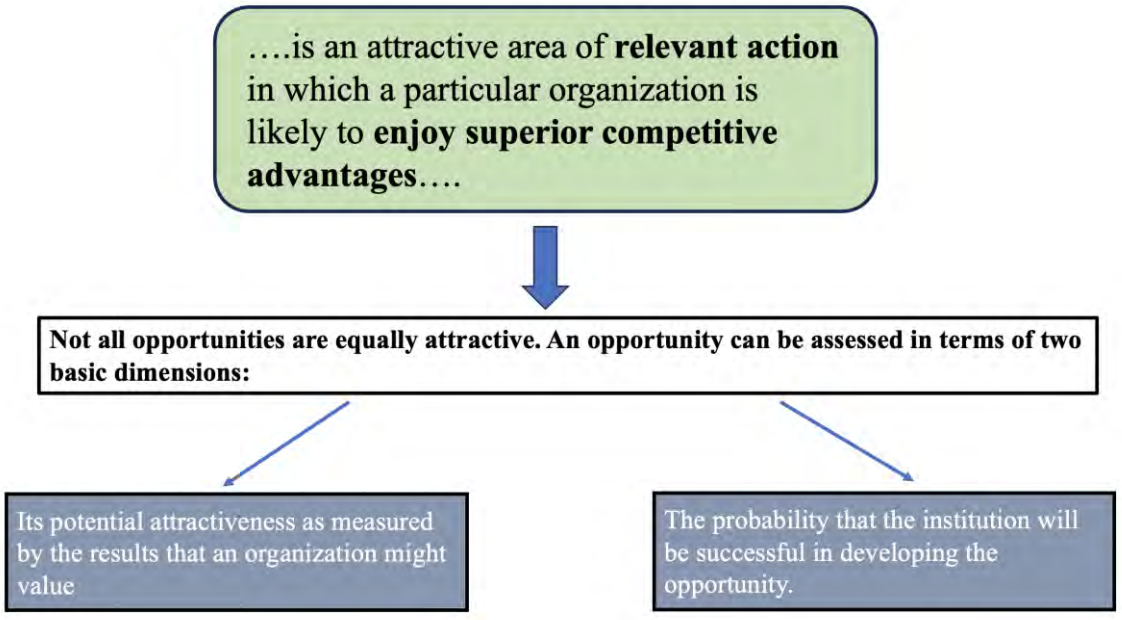
One of the most important stages in determining which areas should an institution focus on immediately and which areas should it prioritize for a later stage. **An organization should pursue goals and opportunities and strategies that are in line with its strengths and avoid those where its resources would be too weak.**

The analyzed data can be categorized either as a threat or an opportunity.

What is a threat?



What is an opportunity?

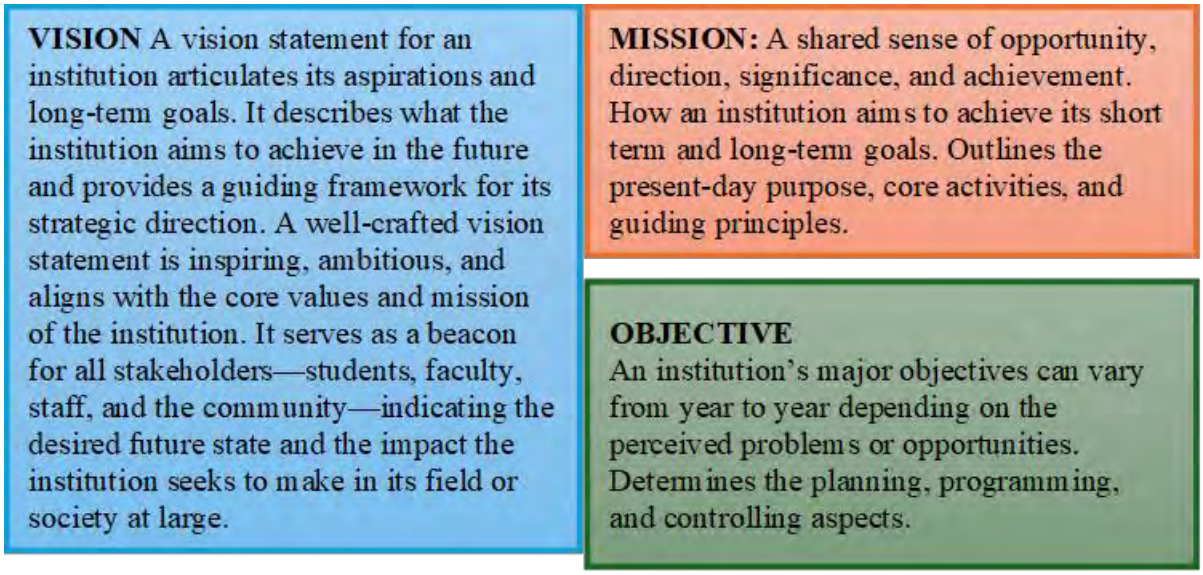


For Example: Increasing Demand for Vocational Skills Training:

- **Strengths**: The institution has a strong faculty with industry expertise and a well-equipped vocational training facility.
- **Weaknesses**: Limited variety in vocational courses offered compared to demand.
- **Opportunities**: There is a growing demand in the local job market for skilled professionals in specific vocational fields.
- **Challenges**: Competition from other institutions offering similar programs; ensuring curriculum relevance to evolving industry needs.

Step 6: Commencement of the IDP preparation

The expansion of the IDP begins with the formulation of the Vision, Mission, and Objectives. This step builds upon and beyond the initial discussions based on inferences gathered from the accumulated data analysis. This shall involve rounds of discussions amongst the relevant stakeholders.



For Example:

For a women's general degree college, the three statements may be as follows:

Vision: To be a globally recognized centre of excellence in women's education, empowering future leaders through academic rigor, holistic development, and inclusive community engagement.

Mission: Our mission is to provide a transformative educational experience that prepares women to excel academically, professionally, and personally. We are committed to fostering a supportive and inclusive environment that celebrates diversity, promotes critical thinking, and cultivates leadership skills

Objectives: Increase placement by 15% within the next academic year.

Role of Leadership and Governance

The leadership plays a pivotal role in the preparation of the IDP. Institutional leaders, including Board members and senior administrators, are responsible for setting the vision and strategic direction of the IDP. They facilitate the collaborative process, ensuring participation from faculty, students, and staff to create a comprehensive and inclusive plan. Leadership ensures that the IDP aligns with institutional goals, regulatory requirements, and accreditation standards. They also oversee the integration
of academic and non-academic initiatives, performance assessment systems, and measures to support diverse student cohorts. Furthermore, leaders are tasked with securing resources and public funding based on the IDP, monitoring progress, and making necessary adjustments to achieve the institution's long-term objectives.

Leadership strategies that can be employed to effectively guide the institution through the development and execution of a robust and forward-thinking IDP are as follows:

1. **Collaborative Leadership**: Engage all stakeholders, including faculty, students, staff, and Board members, in the planning process to ensure diverse perspectives and buy-in.
2. **Visionary Leadership**: Set a clear, inspiring vision and strategic goals for the institution's future, aligning the IDP with these objectives.
3. **Inclusive Leadership**: Ensure that the IDP addresses inclusivity and diversity, promoting equal opportunities and support for all student cohorts.
4. **Data-Driven Decision Making**: Use data and evidence to inform planning, set benchmarks, and measure progress.
5. **Transparent Communication**: Maintain open lines of communication to keep all stakeholders informed and involved in the IDP development and implementation.
6. **Adaptive Leadership**: Be flexible and responsive to changing circumstances and feedback, adjusting the IDP as needed.
7. **Resource Management**: Secure and allocate resources efficiently to support the initiatives outlined in the IDP.
8. **Professional Development**: Invest in training and development for faculty and staff to enhance their capabilities in contributing to the IDP.
9. **Mentorship and Support**: Foster a culture of mentorship, where leaders support faculty and staff in their roles as mentors and guides to students.
10. **Accountability and Evaluation**: Implement systems for regular review and assessment of progress towards the IDP goals, holding individuals and departments accountable for their contributions.

Challenges in developing an IDP

'Symbolic' system	Resourcing	Champions	Other criteria-based promotion
Winning the hearts and minds of those who will be responsible for implementing IDPs	* Require many academic staff within HEIs to engage in the operational process * Maintaining staff attitudes * Negative attitudes are likely to increase if staff involvement in this process is seen as imposing an additional burden on busy academics	Preparing the faculty who saw the benefits of IDP to go the 'extra mile'.	*Focused effort *Re-evaluate criteria for staff promotion and career advancement. *Participation in the support mechanisms, including IDP, which complement the classroom experience should be rewarded

Tentative timeline in developing an IDP

Activity Planned	Proposed Time Frame
Formation of IDP strategy team	10 days
Survey Questionnaire and focus group discussions	30 days
Data Analysis	30 days
Discussion: Mission, Vision, Objectives	5 days
Formulation: Mission, Vision, Objectives	5 days
Preparation of IDP with long term and short-term goals	15 days- 30 days
Implementation Strategy	15 days

Conclusion

In conclusion, change is essential in developing an IDP as it ensures adaptability to evolving trends, fosters continuous improvement and innovation, and engages stakeholders in a collaborative process. It enables compliance with regulatory standards, optimizes resource allocation, and enhances institutional resilience to unforeseen events. Embracing change ensures the IDP remains relevant, effective, and aligned with the institution's goals and the broader educational landscape.

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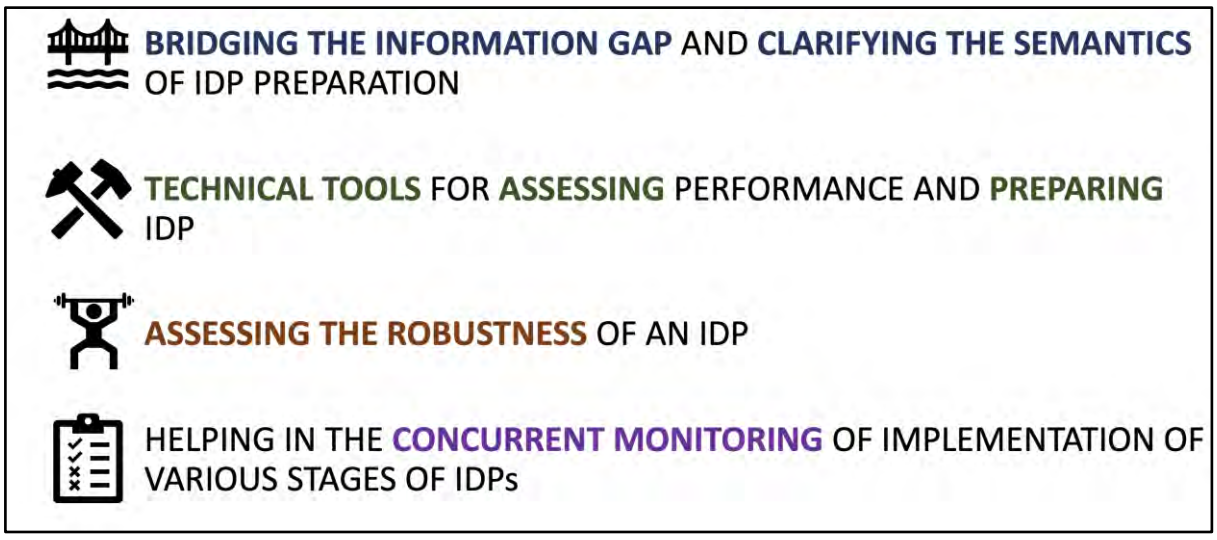
- NEP 2020

Appendix

- **UGC, List on Overarching areas to be assessed: https://shorturl.at/rNuP2**

- **Role of CRISP in developing IDP**



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