Quality Mandate for Higher Education Institutions in India

February, 2021

University Grants Commission
Bahadur Shah Zafar Marg, New Delhi-110002
Website: www.ugc.ac.in

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FOREWORD

In its constant endeavour to ensure quality and excellence in higher education, UGC has been striving to take initiatives to continuously improve the quality in Higher Education Institutions (HEIs) in India. Moving ahead in this direction, UGC in 2018, set forth the Quality Mandate, an initiative , with the all-encompassing priority to improve teaching learning and innovative skills, critical thinking, inclusiveness, employability, learning outcomes curriculum framework, gender sensitization, social connect, sustainable development competitiveness, and skill development of students in the tertiary education system in India.

I am proud to present a book on 'UGC's Quality Mandate Initiatives', a work of dedication and commitment, which will be a torchbearer for the stakeholders of Indian Higher Education landscape, to explore through the key initiatives the higher education regulator has already undertaken to compete with the global scenario.

Various focus areas of the book relate to teacher training, induction programmes for students, faculty development programme, accreditation, assessment and examination reforms, society and industry connect, institution-industry interface, ICT-based leaning and mentoring of institutions. Special care has been taken to establish a link with India's heritage and traditions to ensure learning with a healthy mix of the ancient heritage and the twenty-first century dynamics .

UGC embarked on this journey in 2018 by setting Quality Mandate objectives and ten verticals. In the last two years committed and dedicated work has resulted in the successful implementation of all verticals and now this scholarly and adding to the glory this well-balanced book is being brought out on Quality Mandate. I hope the HEIs and the stakeholders find the subject matter in this book immensely informative and it helps them to reflect on their own practices. My congratulations and thanks to all the authors for their contribution to this endeavour of UGC in improving Quality of Higher Education in India. The esteemed contributors to this book are authorities in their fields and therefore, they are entitled to express their thoughts and points of view. We thank them for their valuable cooperation and contribution.For UGC to successfully publish this scholarly book during the period of nation-wide lockdown is possible only because of the sincere efforts of Prof. Bhushan

Patwardhan, Vice-Chairman, UGC, Prof. Rajnish Jain, Secretary, UGC and I take this opportunity to sincerely acknowledge the significant contributions of Dr N Gopukumar , Joint Secretary ,UGC and Dr Diksha Rajput, Deputy Secretary, UGC in bringing out this book.

I hope the Higher Education Institutions and its stakeholders may find the subject matter in this book greatly helpful and could make them reflect on their own practices.

Prof. D. P. Singh
Chairman
University Grants Commission

New Delhi
8th February, 2021

Acknowledgements

The expansion of higher education sector in the recent times is unprecedented. Since the beginning of the century, there is a fourfold increase in the number of universities, colleges, number of students and faculty members. With the record growth of higher education sector, it became important to pay sufficient attention to higher education sector to ensure that the expansion is qualitative and meaningful for students and the society. It is in this background, UGC launched "Quality Mandate" in 2018 with five objectives and 10 verticals. The last two years have been quite productive for the UGC and the result is that all the verticals have been implemented and now a book on "Quality Mandate" comprising 15 chapters on different titles connected with quality mandate. Well known authors and experts of their fields: Prof. Bhushan Patwardhan, Dr.Renu Batra, Dr. Pankaj Mittal, Prof. Darshan Shankar, Prof. Amita Chatterjee, Prof. A.K.Singh, Prof. Soumya Roy, Prof. Yamini Karmarkar, Prof. Jayendrasingh Jadav, Prof. S.C.Lakhotia, Prof. Vadudha Kamat, Prof. M.M.Salunkhe, Prof. Anthony Rose, Prof. Sushila Singh, Prof. H.Vinod Bhat, Prof. S.C.Sharma, Prof. N.V.Varghese, Prof. M.K Sridhar, Prof. Chetan Singai, Prof.Mugdha Sharma, Prof. Prem Kumar Kalra, Prof. K.Soami Daya, and Prof. J.R. Verma have contributed enormously in the form of chapters for the book. I thank all of them for their valuable contribution in the form of chapters for the book.

I am grateful to Prof. D.P.Singh, Chairman UGC for his visionary leadership in setting the "Quality Mandate" and encouraging its implementation. I am also thankful to Prof. Bhushan Patwardhan, Vice Chairman, UGC for his support and guidance in publishing this book. I sincerely thank Ms. Indu Ramchandani for taking up the task of editing the book and completing it in record time. I am thankful to Shri Prakash Thakur, Financial Advisor, UGC for his continued support. I appreciate and thank Dr. Gopukumar, Joint Secretary, Dr. Diksha Rajput and the team of publications section for their untiring efforts in bringing out this book. I would like to place on record my appreciation to all UGC officials who have contributed in bringing up this book, especially at a time when the country is undergoing unprecedented times due to COVID-19 pandemic.

Prof. Rajnish Jain
Secretary, UGC
University Grants Commission

New Delhi
8th February, 2021

QUALITY IMPROVEMENT PROGRAMMES IN HIGHER EDUCATION

Bhushan Patwardhan*, Pankaj Mittal, Renu Batra*****

EDUCATION FOR NEW INDIA

"Whatever education a university imparts, it must achieve the global level of benchmarking given the vastness and diversity of the global village we live in today"…

Prime Minister Narendra Modi

Quality education empowers people to optimally achieve their potential both as individuals and as members of society. It is not merely about teaching facts, but also about cultivating knowledge on how to establish those facts. Quality education involves critical thinking, and learning to work with others along with working independently, in multiple disciplines. Mahatma Gandhi's ideas on education, like *Buniyadi Shiksha*, are more valid today, as we celebrated his 150th birth anniversary in 2019.

In line with these developments and juxtaposing the aspirations of New India, NITI Aayog (the policy think-tank of the Government of India), came out with a 15-year agenda for the education sector articulating its vision, strategy, and action plans. In 2018, the University Grants Commission (UGC) declared Quality Mandate, consisting of 10 verticals. Following this, the Ministry of Human Resource Development (MHRD) constituted a high-power committee, under the chairmanship of Dr. K. Kasturirangan, to prepare the Draft of the National Education Policy (DNEP). The DNEP-2019 envisions an India-centred education system that contributes directly to transforming India into a sustainably equitable and vibrant knowledge society, by providing high-quality education in a holistic manner. It is based on the principles of access, equity, quality, innovation, and excellence. The regulatory framework must encourage not-for-profit private efforts while eliminating the commercialization of education by ensuring good governance, financial stability and security, educational outcomes, and transparency of disclosures. The DNEP strongly advocates a student-centric system, flexibility, liberal education, multiple-entry multiple-exit options, multidisciplinary approach with emphasis on conceptual understanding, creativity, critical thinking, values,

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ethics, life skills, equity and inclusion, institutional autonomy, empowerment, faculty development, and strengthening research culture. Indeed, the DNEP is a very visionary and timely effort that could help to re-imagine, recalibrate, and rediscover core virtues of the Indian education system.

AS AN IDEA OF QUALITY

In the 1990s, OECD defined quality education like the one that, "Assured the acquisition of knowledge, capacity, skills, and the necessary attitude by all youngsters in order to get prepared to adulthood." The document, "The four pillars of education", from UNESCO, rejects the mere instrumental and productivist view in education. It states that human's education must be organized according to four fundamentals of learning: learning to know, learning to do, learning to live together, and learning to be. According to a UNESCO representative, "These four pillars must be found in the education quality improvement policy, since they cover human beings as a whole, from the cognitive to the ethical, from the aesthetical to the technical, from the immediate to the transcendent."

Quality in higher education is a multi-dimensional, multi-level, and dynamic concept that is related to specifications of the context of an educational model, to the mission and institutional aims, as well as to the specific patterns within a certain system, institution, programme, or discipline. Quality may then have different meanings depending on:

1. The understanding from different groups or stakeholders interested in higher education.
2. Its references: inputs, process, output, missions, aims, etc.
3. Attributes or features of the academic world that must be evaluated.
4. The historical periods of higher education development.

Regardless of the level of analysis — classroom, course, institution or education system, the understanding of quality in higher education may often change depending on time and on the environment. For some people, quality is a fundamental objective in education; for others, it may stop existing. For some, it can be measured; for others, it can be 'operationalized'. For market agents, it must prioritize 'employability'; for the social movements, it must prioritize equity.

The emphasis given to the debate about quality is preceded by quantitative demands. Quantitative solutions in education are expressed through various mediums in different countries:

- increase in expenses connected with education;
- increase in the number of years spent in compulsory education;
- early-age children being admitted in schools; and
- development of economic theses about education, such as the "theory of human capital", which is used to explain the economic growth in these countries.

An environment appropriate to the development and creation of quality in higher education takes the scene worldwide since it has been recently facing 'hostile' factors and challenges, such as financial limitations, competition among institutions, the massification of systems, teachers' demotivation, and institutional autonomy. In many cases, such programmes have a close link with the conceptions of management from the industrial sector, which emphasize efficiency, productivity, and cost-reduction. Characteristic terms from the private sector, companies and the market such as strategic planning, total quality, and audits become part of the routine in higher education institutions and universities. Those who advocate the business quality models (total quality management, total quality) state that such facts result from some characteristics found in the academia, such as: resistance to perceiving the student as a client; hard time working as a team; and being grounded in tradition with resistance to new practices. On the other hand, other theses state the inadequacy of the industrial concept of quality to higher education due to the qualitative nature of teaching and researching, since these practices cannot be translated into management and business logic.

Ultimately, it is perfectly possible that quality in higher education has a particular meaning to one group and, distinctly different meanings to other groups. The understanding of quality is inexorably subjective since it fundamentally depends on the worldview and of higher education by those who spread it. It has been so in the last few decades, and it is the same even in the early 21st century. It will probably remain the same in the years to come.

INDIAN SCENARIO

The Indian Higher Education System (HES) is confronted with interdependent attributes including access, equity, relevance, quality, funding, and governance with technology, pedagogy, and teachers as the key drivers. Technological advances in computing, artificial intelligence, cybernetics, and robotics coinciding with the evolution of virtual reality, 5G internet, 3D holographic systems, and increased penetration of social media are changing the needs,

character, pedagogy, and delivery of higher education. Typical compartments such as, campus-based, face-to-face (F2F), distance or online education are rapidly fading in favour of a blended system, as information silos such as conventional, professional, technical, or skill-related, are converging. The role of a teacher is changing from an information provider to a learning facilitator. Education is now seen as an empowering mechanism that enhances human values, accelerates the creation of knowledge and its applications to meet individual, socioeconomic, and sustainable development goals for global good. Privatization is becoming an international pursuit and India cannot remain isolated to the opportunities and threats from the new business of education. The current education system needs to evolve over a backdrop of sustainable development goals in the context of social, technological, and industrial revolutions. The Indian education system has evolved through multiple phases — from the ashram-based *gurukula* environment to university-based *kulaguru* system. Re-discovering virtues and learning from the glorious past of the Indian education system can help us to pave the way towards a bright future.

> *"We want that education by which character is formed, strength of mind is increased, the intellect is expanded, and by which one can stand on one's own feet."*
>
> *Swami Vivekananda*

ATTRIBUTES

Access and Equity

The institutional capacity of higher education in India has witnessed a manifold increase since independence. In the last 70 years, the number of universities has increased from 20 to 993, colleges have gone up from a mere 500 to almost 40,000, and the number of teachers jumped exponentially from 15,000 to nearly 15 lakhs. The enrolment of students, therefore, has increased from one lakh in 1950 to over 3.74 crores in 2019. The growth in institutional capacity in terms of the number of universities/colleges and teachers has provided greater access to students to post-secondary education.

The Gross Enrolment Ratio (GER) that is, the ratio of persons enrolled in Higher Educational Institutions (HEIs), to the total persons in the age group of 18 and 23 years, in India is, however, just about 26.3 per cent, whereas, it is about 36 per cent for countries in transition, 54.6 per cent for the developed countries, while the world average is 36 per cent. This shows that a lot has to be done in India to increase access to higher education (the target being 50 per

cent by 2030). The comparatively low enrolment for the socially-disadvantaged sections of society, minorities, economically marginalized sections, women, rural population, and those residing in remote and hill areas, raises the issue of equity and substantiates the need for providing much higher educational opportunities for these categories and areas.

Although GER is considered a vital parameter for the Indian HES, close scrutiny reveals that the problem is deeper. If one considers the Eligible Enrolment Ratio (EER), that is, the ratio of the number of students enrolled in higher education to the number of persons who have passed the class XII examinations in the age group of 18 to 23, a different scenario emerges. The EER for India is about 60 per cent, much more than several developed countries. The more astonishing fact is that EER is almost evenly balanced, cutting across caste, religion, region, and gender. Undoubtedly, one would not target 100 per cent of the eligible persons to enrol as a wide range of skilled manpower is needed in many areas for which higher education is not an essential requirement. The Government of India has also taken many effective steps such as Right to Education and *Sarva Siksha Abhiyaan* (SSA) to increase school enrolment, leading to higher numbers passing out of school. Consequently, even if the EER is sustained at the same level, the numbers for enrolment in institutes of higher education will increase substantially. Therefore, there is a need to shift the focus from "creating expansion" to "accommodating expansion".

Relevance

Today, in the 21st century, the idea of a university is changing drastically, leading to a conflict between the goals of attaining social justice through education on the one hand, and using education as means to individual prosperity alone on the other.

The goals of inclusive development, democratic governance, and sustainable growth can be meaningfully achieved by ensuring the involvement of institutions of higher education in societal development, which in the process will also meaningfully harness the idealism and dynamism of the youth. This is essential if education is to bring about social transformation. For this, institutions of higher education need to locate their learning and teaching in the communities in which they are located, wherein community engagement is seen as intrinsically connected to learning and teaching and not merely an 'addition'. Through community engagement, we can bridge the gap between theory and practice, make the theory more relevant and practice more

informed, as community knowledge systems become the legitimate partners in the process of the development of innovations and trained human resources. This will promote deeper interactions between HEIs and local communities for identifying the real-life problems faced by the communities, in a spirit of mutually agreed on interest and interaction, and finding solutions thereof. It would facilitate partnerships between local communities and institutions of higher education so that students and teachers can learn from local knowledge and wisdom, thereby democratizing knowledge production. The HEIs can also engage with local communities to make curriculums, courses, and pedagogies more appropriate to achieving the goals of national development. They can catalyse the acquisition of values of public service and active citizenship amongst students and youth alike in the process of such engagements, which would also encourage, nurture, and harness the natural idealism of youth. The universities can also undertake research projects, which are need-based and community-oriented, including community as research partners, leading to policy formulation for societal development.

Apart from societal development, individuals who pursue higher education look for material gain in terms of employment after passing out of the HEIs. This calls for a dynamic curricular content, which should evolve continuously. It appears that the education being imparted in majority of our HEIs is not relevant to the industry. The employability report 2019 by Aspiring Minds estimates that 80 per cent of Indian engineering graduates are unemployable. Their curriculum is out-dated and teachers generally resist updating the syllabus because they do not want to continuously and regularly update themselves. Industries/companies and institutions have to arrange special induction training or finishing schools to train graduates and make them employable. Therefore, the relevance of the education being imparted both in terms of content and pedagogy is being widely questioned. We need to take urgent steps to contain the situation and make the education being imparted to our students relevant for their future life.

Curriculum revision has to be an ongoing academic activity involving all faculty members and students not only to ensure quality but also add contemporariness and relevance. Curricula have to be updated and revised to ensure:

- current knowledge,
- national and international developments, and

- relevance of new ideas, concepts, and knowledge of the concerned discipline.

At the same time, faculty members need to update their knowledge through books, journals and open education resource available on the Internet, in their areas of specialization, especially relating to their teaching assignments. They can be encouraged to complete Massive Open Line Courses (MOOCs) offered by various national and international experts. The concept of finishing schools is slowly gaining importance in the industrial sector. The objective is for the industry to conduct special training for graduates to turn them into "finished products", thereby making them employable. This concept should be amalgamated with the course structure to ensure that the "readily employable" certification is acquired at the university itself.

Governance

Emerging challenges in the higher education sector demand appropriate skills and competencies on the part of educational administrators to prepare the institutions to take on these challenges. The administrative machinery, which is not equipped with the necessary skills, knowledge, and attitude and which is not in sync with the needs of the progress, can retard the pace of development of a university. A flexible pattern of governance, which is responsive to the changing needs of society, global trends, and knowledge, can be a powerful factor in accelerating progress. In the wake of internationalization of education, coupled with globalization and competition, the HEIs need to be managed more professionally. The traditional university administration, being run with 19th-century tools, has to be replaced by modern management techniques along with qualified, professionally-trained, and pro-active administrators, suited to the fast-changing world.

Financing

It is said that if you want to invest for a year, invest in corn, if you want to invest for 20 years, invest in trees, and if you want to invest for a lifetime, invest in education. Although the Central and State Governments are making efforts to fund higher education, they are still far from the goal of 6 per cent of GDP to education as advocated by the Kothari Commission, and therefore, the financial crunch in Indian universities and/or colleges is evident. This is more so for state universities and colleges, which are at the bottom of the ladder, in terms of government funding. Apart from the privatization of higher education, which is making a direct in-road into the HES of the country, we

have to think of ways of mobilizing resources for government institutions. The universities have to make special efforts to mobilize resources, both internal and external. The facilities existing in the universities have to be used to optimum capacity for mobilizing resources.

KEY DRIVERS

Technology

Very soon Artificial Intelligence (AI) Robotics will dominate the education space and content will be freely and readily available in the future. Education is supposed to be more self-directed, a self-paced learning process triggered by interest learning where problem-solving, innovation, and creativity are the driving forces. Future education will be collaborative where cross-institutional, cross-cultural opportunities and learners will play key roles as creators of knowledge thus challenging the monopoly of teachers. Education will have to be competency-based instead of merely information- or knowledge-based; demand-driven instead of supply-driven by incorporating skills capable of adapting disruptive technologies. Education must be flexible, modular, and lifelong with more emphasis on the emotional quotient (EQ) than intelligence quotient (IQ). New Education will have to meet the need of Industry — Education 4.0, man and machine alignment, and E 5.0 an education system that produces new knowledge, goods and services — enabling collaborative convergence of man and machines, as CoBots, to explore new pedagogies. E 5.0 will have to maximize the power of digital technologies, MOOCs, animated laboratories, and personalized data from the interconnected world.

Faculty

The role of teachers remains the most important driver in improving the quality of education. Educational qualifications such as PhD or passing tests such as NET/SET may be the basic eligibility conditions for teachers. However, 'teaching' as a profession requires every teacher to undergo a rigorous faculty training programme. Commonly, faculty have been involved in monotonous monologues and monopolized delivery of education. The average full-time teacher remains largely insulated from the broad changes taking place in higher education. We need to transit from the passive mode of "teacher >> teaching" to the active mode of "student >> learning". The new pedagogy should be based on collaborative learning and mentoring. Teaching cannot be the monopoly of teachers or university campuses. There is a widespread perception that the development and control of content is shifting from traditional institutions

to communication networks. It is feared that these networks may begin to control the means of delivery, could afford to pay content specialists without needing to support research and associated institutional infrastructure, and that they might develop systems geared specifically for global markets. There are very real threats confronting the faculty, particularly of the higher education sector and the need for considered and resolute change is obvious. Experiential learning is very critical where communities have a major role to play. In the current scenario, students and teachers can learn much better if they are sent out of campus in society. Students and teachers can work with farmers, cottage industry, development projects, police, army, or any other organizations. Such real-life experiences and interactions with communities will be very valuable and transformative during education. Currently, the UGC is considering the possibility of a structured, credit-based semester outreach programme.

Pedagogy

The focus is on issues of pedagogy that arise in connection with the new forms of instruction, new technologies, and new courseware. We need to divide education into segments that share similar aims, functions, and characteristics. The purpose of mainstream higher education is shaping the mind, character, and sensibility. This requires prolonged association between students and teachers, thus it is marked by a high ratio of teachers to students. The open and distance mode of higher education centres, focuses on the transmission of knowledge. Work is oriented to the earning of certificates of accomplishment. These degrees can serve as a proxy for employers as an indication of the student's possession of useful skills and knowledge and an indication of the student's capacity to learn at certain levels of difficulty. There are three possible models of pedagogy based on costs and technology.

1. The first model involves delivery of information. In this model one can use MOOCs to deliver high-quality, well-written materials over the Web to large numbers of students. Technology can be very cost-effective here.
2. The second model has faculty as mentor. Here one cannot have a large number of students without losing the quality of interaction or burn-out of faculty. Since this model precludes a large number of students, the use of technology, however, becomes expensive.
3. The third model involves forming a community of learners with smaller groups within a class, on social media, or with any other suitable learning platform.

Faculty who fear being replaced by MOOCs with a combination of video recordings, CD-ROMs, Web pages, and books, need to ensure that their classroom interactions provide something uniquely more valuable for the students than can be captured and delivered in any other medium. Online teaching is not necessarily cheaper, better, or easier than face-to-face (F2F) teaching; it's not for everyone and unlikely to replace F2F teaching completely. The future pedagogy will involve a blended approach involving MOOCs for the delivery of information, open and distance modes for conventional courses, and F2F for professional and skill-based courses.

PROMOTING QUALITY EDUCATION

The quality of higher education is the most crucial factor for deciding the future of any country and necessitates utmost attention and constant assessment to foresee prospective outcomes, especially in a developing nation like India. In global ranking and research metrics of HEIs, Indian HEIs are persistently found to be lagging far behind as compared to other world universities. In the QS Ranking 2020 (Quacquarelli Symonds Rankings 2020), there is no Indian university in the top 100, there are three universities in the top 200, nine universities in the top 500 and twenty-three universities in the top 1000. Almost the same story repeats in the rankings given by the Times Higher Education where no Indian university appears in the top 300, six are in the top 500, and thirty are in the top 1000. This dismal performance of the HEIs in India, which are large in number, about 1000 universities in 40,000 colleges, calls for urgent action on the part of all stakeholders. Issues such as large number of colleges affiliating to the State universities, inadequate university-industry connect, unemployability of the graduates, diminishing resources for higher education, and reduction in number of research publications and awards, call for a major revolution in the education space.

School education, which is the base line for higher education, should be seamlessly integrated with higher education. The quality of education at the school level should get a special focus, wherein teaching perspective should shift from being examination-oriented to quality learning, with emphasis on understanding and overall holistic development rather than rote learning. To ensure holistic development of the students at the university/college level, efforts need to be made to reorient the teaching pattern with focus on all types of courses:

- Core courses — in the subject of specialization of the student in his/her UG/PG programme;

- Elective courses — chosen by students from other departments as per their aptitude;
- Supportive courses — in soft skills and life skills including communication and personality development; and
- Social orientation courses — that provide value addition to the students' livelihood, such as courses in Environmental Education, Human Rights Education, Value and Ethics Education, Societal Development, Peace and Conflict Resolution.

Focusing on higher education in India, we need to keep in view its alarming deteriorating quality. We have to aim at enhancing employability and prepare graduates for a rewarding career. To set in motion a process of in-depth reforms so as to transform higher education in India at par with global standards, the UGC has framed a Quality Mandate with certain objectives.

QUALITY MANDATE

At the behest of MHRD, Quality Mandate (QM) was adopted by the UGC in a meeting of Vice-Chancellors in 2018 on the day of *Gurupoornima* (when the guru, or teacher is venerated). QM has the following five objectives and ten initiatives to be implemented by HEIs by 2022, to improve the quality.

Objectives

1. Improve the graduate outcomes for the students, so that at least 50 per cent of them get access to employment/self-employment or engage themselves in the aim of higher education.
2. Encourage the link of the students with the society/industry such that at least two-third of the students are involved in socially-productive activities during their period of study in HEIs.
3. Educate students in crucial professional and life skills such as effective communication, leadership and social skills; instill professional ethics, universal human values, the spirit of innovation/entrepreneurship and critical thinking among the students and promote avenues for the display of these talents.
4. Ascertain that teacher vacancies, at any point of time, do not exceed 10 per cent of the sanctioned strength; and 100 per cent of the teachers are trained in the latest and emerging trends in their respective subject domains, and the pedagogies that translate their knowledge to the students.

5. Every HEI gets accreditation with a minimum score of 2.5 by 2022 from the *National Assessment and Accreditation Council* (*NAAC*).

Initiatives

To achieve the objectives of QM, the following initiatives shall be undertaken by HEIs:

1. Induction programme for students.
2. Learning Outcome-based Curriculum Framework (LOCF) — revision of curriculum in regular intervals.
3. Adoption of Information and Communication Technology (ICT)-based learning tools for an effective teaching-learning process.
4. Imparting Life Skills to students.
5. Social and industry connect for every HEI: Every HEI shall adopt at least five villages for the exchange of knowledge and for the overall social/economic betterment of the village communities.
6. Evaluation reforms.
7. Tracking of students' progress after completion of the course.
8. Faculty development.
9. Quality research and the creation of new knowledge.
10. Mentoring of non-accredited institutions, so that every institution can get accreditation by 2022.

Each of these verticals has been taken up in "mission mode" by the UGC and the Government of India. A small brief about the objective and the implementation strategy for each of the verticals of the UGC Quality Mandate is given as follows.

1. Induction Programme for Students — Deeksharambh

The UGC has initiated a Student Induction Programme (SIP) in Institutions of Higher Learning. Sincere implementation of the SIPs by HEIs at the commencement of undergraduate courses will reassure both students and teachers, and set the pace for fruitful teaching-learning experiences. UGC has formulated, "Deeksharambh — Guide to Student Induction Programme", available on UGC official website (www.ugc.ac.in), to provide strategies to the faculty for organizing SIPs in HEIs, which offers new entrants, a brief sketch of the complete realm of university life.

The goal of the SIP is to:

- develop the inherent competences and kindle a positive attitude in the new entrants of higher education;
- inculcate the emotional or intellectual energy and values of the HEI;
- cultivate a sense of intimacy and an awareness of privileges and responsibilities; and
- thus make the change from school to college/university visibly pleasant.

Mentoring blended in the SIP sessions, based on universal human values such as truth, righteous conduct, love, non-violence, and peace can act as a source of high-order inspiration towards the nation's traditional values and culture and instill self-awareness and sensitivity, feeling of equality, compassion, and oneness towards society in large. It can empower students to better reflect their bond with families, extending that to the institution of higher learning. A holistic programme will unite students among themselves and with their teachers, and instill confidence and trust for them to reach-out as and when needed.

2. *Learning Outcome-based Curriculum Framework (LOCF)*

The higher education curriculum can be viewed as an enlightening material reflecting diverse knowledge that is increasingly framed by the necessities and demands of society. The initiative is intended to revise the curriculum to bring it at par with global trends in higher education, by adopting the LOCF that comprises graduate attributes and the expected learning outcomes that a learner must master on completing the academic programme.

Incessant endeavours are essential to:

- institutionalize an outcome-based HES,
- boost employability of graduates through curriculum reforms,
- upgrade academic resources and learning environment, and
- raise the quality of teaching and research across all institutions of higher learning.

To promote high-order thinking skills such as analysis, synthesis, evaluation, and creativity, UGC has framed subject-wise documents on LOCF for undergraduate education. The qualification of higher education is awarded when students attain specific knowledge, understanding, skills, attitudes,

and values, and academic standards that are expected from graduates of a programme of study. Revolutionizing and preparing curricula to be more responsive to societal and learner needs would guarantee a strengthened foundation for the lifelong quality education for each learner.

The goal of the LOCF is to facilitate HEIs to devise graduate characteristics, qualification descriptors, programme-learning and course-learning outcomes that are projected to be attained by a graduate. It further helps to uphold national standards and international comparability of the learning outcomes and academic standards to guarantee global competitiveness and enable graduate mobility. LOCF helps HEIs to regularly plan teaching-learning strategies, assess student-learning levels, and review programmes and academic standards.

The basic premise of the LOCF approach is to align the traits that a graduate is expected to attain, with the programme learning outcomes and assessment process. Learners realize what is expected of them and educators know what they are expected to teach. It clearly spells out what learners can expect when they complete a particular programme of study. The framing and implementation of curricula, based on the expected-learning outcome is a continuous process that requires reassessment and adaptation with time. Some learning goals may be appropriate globally, but there are also specific national, regional, or locally relevant concerns that a curriculum needs to address, from time to time. To execute a devised curriculum framework is a multifaceted process, which spans over a period of time. It is successfully accomplished by sharing the ideas and expertise of educators in the country.

3. *Adoption of ICT-based Learning Tools for Effective Teaching-learning Process*

Hi-end technology, including MOOCs, have been globally recognized to augment the efficacy of higher education. In this digital era with rapidly changing employment patterns, workforces need to be reskilled and up-skilled, and that demands lifelong learning through online courses. Owing to rapid advancements in Information and Communication Technology (ICT) and global interconnections, the HES has grown exponentially in the past few years to meet the demands of talented youngsters, curb the digital gap, and cultivate a knowledge society. Extensive ICT and MOOCs offer exposure to learners, especially in HEIs in underdeveloped and remote areas to learn online, get online certification and guidance by access to high quality

information, economically viable and accessible higher education resources. MOOCs provide a flexible learning platform, which is a valued add-on to classroom learning.

The goal is to train graduates for the futuristic professional scenario, by blending ICT-based teaching-learning tools and add-on online MOOCs courses from the Study Webs of Active-learning for Young Aspiring Minds (SWAYAM) Platform as part of the curriculum and thereby help them to get acquainted with lifelong learning and enable academic faculty to adapt to state-of-the-art practices in the delivery of the curriculum.

The Government of India's SWAYAM Platform is designed to achieve the three fundamental values of the education policy — access, equity, and quality. The prime aim is to provide the best teaching-learning resources to all, especially to the most disadvantaged. MOOCs through SWAYAM endeavour to bridge the digital gap for learners who have previously remained untouched by the mainstream digital uprising. UGC has already issued the UGC (Credit Framework for online learning courses through SWAYAM) Regulation 2016 advising HEIs to identify courses where credits can be transferred to the academic record of students for courses done on SWAYAM. The MHRD-supported, National Programme on Technology Enhanced Learning (NPTEL) initiated in 2003, by seven Indian Institutes of Technology (IITs) along with the Indian Institute of Science (IISc), Bangalore, provides quality education to everyone and is already conducting advance and basic level courses through MOOCs. NPTEL aims to create web and video courses in all mainstreams of engineering and physical sciences at the under-graduate and post-graduate levels and management courses at the post-graduate level.

For the best use of ICT for the teaching-learning process, UGC has undertaken other initiatives: online learning through E-PG Pathshala, National Digital Library (NDL), and University Grants Commission (Online Courses or Programmes) Regulations, 2018. For granting certificate, diplomas, or degree, the focus is to provide these online, delivered through interactive technology using the Internet.

4. *Imparting Life Skills to Students —Jeevan Kaushal*

Ideally, the HES in the country should assimilate sustainable lifestyle education with successful professional life skills. The development of successful educational responses requires transformation of the extant system by making

it more attuned to societal challenges and evolving skills relevant for the global scenario. Life skills comprising effective communication, social skill, time management, problem-solving ability, decision-making capacity, leadership ability, and integrity play a crucial role in boosting the employability of graduates, enrich their personal growth, and transform them into active participants in a democratic society. Life skills empower graduates with the self-confidence to work out constructive, out-of-the-box yet sustainable solutions to the problems they face in their professional and personal lives. They need to apply learnt knowledge in unaccustomed and a wide spectrum of circumstances. The usage of their extensive knowledge and skills will be arbitrated by their attitudes and acquired human values such as respect for fellow humans and the environment.

Life skills cover the set of aptitudes acquired by an individual via classroom learning or life experience that can help them to effectually deal with problems met in contemporary career life. This embraces the core skills each individual must own internally as well as externally for the betterment of self and the society as a whole. Adopting life skills is the key factor to achievement and quality in a rewarding professional and personal life. By learning these skills each learner shall be able to cultivate critical and creative thinking, co-operate instead of compete with fellow beings, and by being an empowered graduate, learn to be unbiased by gender, age, caste, religion or nationality.

The goal is to empower graduates with vital skills essential for global employment and for leading an efficacious professional life. The requisites of the current industry include a wide-angle perspective, skills, and dispositions. This is feasible by offering ample addendums in the curriculum that enhance the dispositions inherent in learners, thereby making them realize what they can do to make the system work for them, educate them, and make them socially responsive and humane.

The Life Skill curriculum developed by UGC necessitates the active participation of learners and faculty. The focus is to develop self-awareness, overcome fear and insecurity, and to expand inside-out and outside-in. It helps students to increase their knowledge and awareness of emotional competency intelligence at the place of study or work and provides an opportunity for realizing potential through practical experience. It enhances interpersonal skills and good leadership behaviour for empowerment and sets appropriate goals, with effective management of stress and time.

5. *Social and Industry Connect: University social responsibility*

The crucial goal of any education institution of higher learning is to create skilled, highly sought-after, globally competent professionals. To prepare its graduates for immediate employment HEIs must fulfill the expectations of industry and prepare employable and skilled graduates. It is vital for an HEI is to intensify university-industry interaction to identify the core knowledge and skills that graduates need to enhance their employability. Laboratories and research facilities in HEIs have to be strengthened and faculty have to take up innovative R&D-related to social needs to create an entrepreneurial ecosystem in the campuses.

To enhance the connect with society, UGC has finalized a 2-credit course on "Fostering Social Responsibility and Community Engagement of Higher Educations Institutes in India". It is a 30-hour, 2-credit course and at least 50 per cent of the curriculum transactions take place in-field. It also suggests amendments in the curriculum of existing courses to orient them towards community engagement by taking up community-based projects and research.

University-Industry (U-I) collaborations ensure far-reaching and enduring socio-economic impact that cannot be achieved by working in silos. Active rendezvous of industry personnel in academic activities along with exposure of students and research scholars to industrial settings, through internships, help in developing the expected skill-sets in them. To develop a futuristic system, the focus should be on the latest developments in the industry and to impart advanced teaching-learning tools in content delivery. Sustainability can only be achieved through innovation — by adopting different teaching methods and by providing flexibility for students. Unfortunately, the existing HES in the country lacks the requisite facilities for such innovation.

Unnat Bharat Abhiyan (UBA)

The Government of India launched Unnat Bharat Abhiyan (UBA) in 2014. It was inspired by the vision of transformational change in rural development processes by leveraging knowledge institutions to help build the architecture of an Inclusive India. UBA aims to involve the HEIs of India in the process of indigenous development of self-sufficient and sustainable village clusters. It develops the necessary mechanism for proper coordination among educational institutions, implementation agencies (District Administration/Panchayati Raj Institutions) and the grass-root level stakeholders. The focus of UBA is:

- enable effective intervention at the field level,
- holistic development of rural clusters, and
- reorient the academic curricula and research programmes in HEIs to align them with the development of the local community.

To this effect, the UBA engages the faculty and students of HEIs in understanding rural realities, to devise the implementation methods for innovative solutions and leverage the knowledge-base of the institutions to devise processes for the effective implementation of various Government programmes. The UBA mission is conceptualized as a movement to:

- enable processes that connect institutes of higher education with local communities,
- address the development challenges of rural India through participatory processes,
- appropriate technologies for accelerating sustainable growth,
- create a virtuous cycle between the society and an inclusive university system,
- provide the knowledge and practices for emerging professions, and
- upgrade the capabilities of both the public and the private sectors.

6. Evaluation Reforms

Evaluation plays a decisive role in improving the quality of the HES. For evaluation to be meaningful, it has to be linked with the learning outcomes of the programme. The UGC report on "Evaluation Reforms in Higher Educational Institutions in India" focuses on the evaluation of students based on continuous assessment modes, the grading system, assessment rubrics, a question bank system for setting good quality question papers, and effective usage of technology for conducting examinations.

The goal is to transform the existing evaluation system by promoting assessment through the continuous evaluation of students' performance by linking it with learning outcomes. And this is not merely based on students' knowledge, but on proficiency of concepts, employability, life-long learning skills, life skills, attitudes, ethics, and values that ensure deep meaningful learning.

A comprehensive list of assessment methods, having distinct utility advantages and limitations for evaluating learners, comprises:

- Written mode such as exams, theses, article reviews, journal writing, case studies;
- Oral mode like viva, group discussion, role play, rapid fire questions;
- Practical mode encompasses lab work, computer simulation, craft work; and
- Integrated mode like presentation of papers, seminars, field assignments, poster presentation.

Tools like rubric or scoring guides for assessment can be utilized to interpret and grade students on any kind of work against criteria and standards and thereby increase objectivity and reduce subjectivity in assessment.

To achieve the evaluation objectives, HEIs must make use of available technology, automation in various examination stages, and ICT-based learning. the Evaluation Reforms Report recommends conducting "On-demand examination" facility. The process of declaring results should be strengthened and HEIs should blend in advanced features for the timely declaration of results, clarity of interpretation of the result cards, comprehensive format, and verifiability.

7. *Tracking of the Student Progress after Completion of Course*

In this age of student-centric learning and under the initiative of Quality Mandate, HEIs have to monitor the students' career progression at every stage. It is important to track the trajectory in students' progress after they acquire the undergraduate or postgraduate degrees. The alumni networks can outspread beyond students' career progression, and can be leveraged for mutually beneficial engagement with the alumni and the institutions of higher learning. The HEI alumni database can be well-utilized to identify and communicate with the alumni and thereby they can be further involved with various beneficial endeavours in the institution. It is important to facilitate "evidence-based policymaking/designing new programmes" by institutions and to support regulatory bodies to masterly implement higher education reforms.

Tasks on hand:

- Effective use of the computer-based administrative data congregated in administrative procedures in HEIs, to be effectively used as a potentially rich source tracking information on students' progress.

- Creating and maintaining updated alumni database is the prime responsibility of the alumni-engagement wing of the HEI.
- Strengthen the alumni network to find out more about the graduates' development paths, and nurture long-term relationship with them.

8. *Faculty Development — Gurudakshata*

The key ingredient to transform and ensure quality higher education in India is the availability of intellectuals to teach, educate, expose, explore, innovate, and inspire the students. Teaching in Higher Education is ethically and intellectually a demanding exercise. The system must attract thoughtful, creative, and fearless minds into the teaching profession. One of the main roadblocks has been and is the shortage of passionate educators. Another impediment is the absence of adequate measures to first attract and then retain the well-qualified people in the teaching profession. Fresh teaching faculty need conscientious training and opportunities for continuous professional development along with academic and professional exposure.

UGC set a mandate for developing and implementing a high-quality "Faculty Induction Programme" (FIP) for the newly recruited faculty in HEIs. This mandate aims to support new teachers to advance their teaching and management skills, fine-tune to the culture of the HEI, and better realize their professional responsibilities. The Commission designed the formal and systematic FIP for the transition of new teachers into well-equipped academicians.

To enable faculty to ensure exceptional output within the limits established by the present HES, the programme has a two-point aim:

1. Improve the value and efficacy of the academic and administrative process of institutions of higher learning.
2. Train teaching and non-teaching faculty for a healthier morale, and equip faculty with state-of-the-art tools and resources.

ARPIT: Annual Refresher Programme in Teaching, another initiative of MHRD launched in 2018, is an ongoing exercise for the career advancement of faculty. It is a major and unique programme for the online professional development of 15 lakhs higher education faculty using the MOOCs platform, SWAYAM. For implementing ARPIT, discipline-specific National Resource Centres (NRCs) have been identified, which prepare online training material with focus on the latest developments in the discipline, new and emerging

trends, pedagogical improvements, and methodologies for implementing the revised curriculum. The training materials are uploaded and made available through SWAYAM.

LEAP: Leadership for Academicians Programme is a three-week flagship — a leadership development training programme (two weeks for domestic and one week for overseas training) to fulfill a long-perceived need of preparing senior faculty, such as Deans, heads of departments (HODs) for future governance roles as leaders in academic institutions.

9. *Quality Research and Creation of New Knowledge*

Comparison of India's Research and Innovations (R&I) investments with international standards, shows that India's R&I investments are far below the benchmark. We persistently lag behind in the number of patents and quality publications that we generate. Among the fundamental duties of an HEI is to address the complex problems of society by its curriculum transformation. HEIs have to engage the academic faculty and students in borderless trans-disciplinary and trans-cultural research. There is persistent need for thought-provoking, multi-disciplinary research for creating new knowledge ecosystems in the country.

The trans-disciplinarily approach is essential for the harmony of knowledge beyond disciplines and it entails far-reaching interaction amidst and beyond disciplines from a real-life problem-based perspective to conquer artificial boundaries between disciplines. It encompasses trans-cultural values, mysticism, and creativity. To infuse the concept into the curriculum demands borderless transdisciplinary discourse on the campus.

The goals:

- Promote quality trans-disciplinary research pertinent to national development by faculty and students.
- Inculcate innovative thinking for the creation of ground-breaking knowledge and thereby inspire academic faculty to evolve as eminent academicians.
- Fund high-impact national network projects in the identified thrust areas in humanities, human sciences, and Indian knowledge systems.

STRIDE: With the aim of transforming higher education research with the revolutionary idea of trans-disciplinary research, UGC introduced "Scheme

for Trans-disciplinary Research for India's Developing Economy" (STRIDE). This scheme promotes quality research by faculty and students, to promote the creation and application of new knowledge, inculcate innovative and cognitive thinking, and improve the quality of doctoral research. The scheme aims to reinforce the research culture and innovation in HEIs and inspire students and faculty to contribute meaningfully to the national progress with trans-disciplinary study.

STRIDE's thrust is on research capacity-building, trans-disciplinary study facilitating national growth, and high-impact research in the thrust areas of the humanities, arts, Indian languages, and knowledge systems. The scheme supports comprehensive innovations related to the conception, development, and assimilation of new ideas, inceptions, and practices for public good and supporting civil society. Trans-disciplinary research for national development focuses on solution-driven efforts addressing requirements of local/regional communities and national primacies. STRIDE supports basic, applied, and transformational action research for national progress to attain Sustainable Development Goals (SDG), which emphasizes overall human advancement.

Research grant support through UGC STRIDE consists of following three components:

- Component-1: Research Capacity Building and Human Resource Development (for all disciplines) and the support under this component can be up to 1crore.
- Component-2: Trans-disciplinary Research and Social Innovation for National Development (for all disciplines) and the support under this component can be up to Rs. 50 lakhs.
- Component-3: High Impact Trans-disciplinary Research in Humanities and Human Sciences. This includes research to address grand challenges for humanities in India and identified thrust areas in philosophy, history, archaeology, anthropology, psychology, behavioural and cognitive sciences, literature, linguistics and digital humanities, Indology, Indian languages, Indian knowledge systems, liberal arts, culture studies, religious studies, law, education, continuing education, technology-enabled education, journalism and mass communication, management and commerce, environment, and sustainable development. The financial support under this component can be up to Rs. 5 crores.

Additional schemes to promote research in Indian universities and institutions launched by MHRD include:

IMPRINT: Impacting Research Innovation and Technology

IMPRESS: Impactful Policy Research in Social Science

SPARC: Scheme for Promotion of Academic and Research Collaboration

STARS: Scheme for Transformational and Advanced Research in Fundamental Sciences.

Academic Integrity

Increased incidence of compromised publication ethics and deteriorating academic integrity is a growing problem contaminating all domains of research. It has been observed that unethical and/or deceptive practices in publishing are leading to an increased number of dubious, predatory journals worldwide. In India, the percentage of research articles published in predatory journals is high. Unethical practices leading to the "pay and publish trash" culture need to be thwarted immediately.

Research and innovation involve rigorous scientific effort in search of truth, in the creation of new knowledge, and contributing to socioeconomic benefits for global good. It is important to prevent academic misconduct including plagiarism in academic writing among students, faculty, researchers and staff. Responsible conduct of research and safeguarding ethics and academic integrity in scientific research is extremely crucial. The Indian academic community needs to ensure that the journals and conferences proceedings they choose to publish in follow standard ethical policies. To this purpose, UGC has set up CARE.

CARE: Consortium for Academic and Research Ethics (CARE) to identify, continuously monitor and maintain a "Reference List of Quality Journals" across disciplines — henceforth referred to as the UGC-CARE List. The UGC-CARE website, lists useful resources as relevant publications, audio-visual materials, videos, and weblinks. The website also provides FAQs, feedbacks, and grievance-redressal mechanisms.

Goals of CARE:

- Promote quality research, academic integrity and publication ethics in HEIs.
- Promote high quality publications in reputed journals.
- Develop a methodology for the identification of good quality journals.
- Prevent publications in predatory, dubious, and sub-standard journals.

- Create and maintain a — UGC-CARE "Reference List of Quality Journals" (UGC-CARE List) for all academic purposes.

10. *Mentoring of Non-accredited Institutions: Focus on every institution getting accreditation by 2022*

UGC has launched 'Paramarsh', a scheme for increasing the number of accredited HEIs in the country with an aim to enhance the overall quality of education system, by supporting HEIs to get accredited by NAAC. The scheme is designed to inspire those HEIs, which have not performed well in the NAAC accreditation and assessment process. The aim is to ensure that every HEI in India gets NAAC accreditation, with a minimum score of 2.5 out of 4, by 2022.

The goals and objectives are:

- Support universities/institutions of higher learning, which have not fulfilled the requirements of the National Assessment and Accreditation Council (NAAC).
- Share the expertise and resources of few top ranked HEIs by designating them mentor institutions so that every institution gets NAAC accredited with a minimum score of 2.5 by 2022.

The Mentors: topmost universities and colleges, which have already attained the highest NAAC grade are invited to share their expertise and resources with the HEIs that have not been able to meet NAAC's quality standards. This would be a leap forward in making the accreditation process prompt. As the above-stated objective, the scheme would endorse well-performing accredited institutions to mentor the HEIs aspiring for NAAC accreditation. A well-crafted scheme of mentor-mentee correlation will not only benefit the HEIs to improve their academic performance and get accredited, but shall also lead to quality education in the university system.

CONCLUSION

India is now on a cross-road where she needs to increase her literacy level to 95 per cent of the population for social mobilization and use technology for creating the best possible skilled manpower for nation-building. The creation of this skilled manpower has two strains:

1. One strain of this human resource will have to be used for commercial export to the rest of the world as a finished product that will give Indians profitable earnings like another inanimate commercial product.

2. The second strain of this human resource has to be geared for taking care of the basic needs of over one billion Indians. They will be the innovators, the indigenizers, catalysts, and originators of ideas to make the country self-sufficient.

This achievement is possible only when there are adequate incentives available to those who want to go for higher education with the focus of becoming nation builders. Ultimately, the financial aspects of the education system as a whole will determine the levels of all the attributes, including but not limited to, excellence, equity, commitment, autonomy, accountability, and most important — relevance to the societal and national development.

VALUES AND ETHICS FOR QUALITY HIGHER EDUCATION

Rajnish Jain*

Introduction

Values and ethics are eternal and essential for the survival of human beings. Educational institutions must be built on pillars of strong value systems and ethical practices to mentor and develop individuals of high character through value-based holistic education. The National Education Policy (NEP) 2020 has imbibed values and ethics in its principles and various provisions. One of the fundamental principles of NEP 2020 clearly mentions the integration of ethics, and human and constitutional values such as empathy, respect for others, cleanliness, courtesy, democratic spirit, spirit of service, respect for public property, scientific temper, liberty, responsibility, pluralism, equality, and justice" in educational systems. It aims at developing traditional Indian values and all basic human and constitutional values among students for ethical decision making. Environment education and respect for the environment have been given due importance in the value inculcation process. It also emphasizes that the curriculum must include values for building character and enabling learners to be ethical, rational, compassionate, and caring. Realizing the role of teachers in education, it reinforces that the teachers must be deeply grounded in values, knowledge and ethos, as they are the crafts persons who will nurture the younger generation for the future.

Quality education is vital for the social and economic development of any nation. It assumes even greater importance for humanity. Sustainable Development Goals 2030 (SDG 2030), was founded by the United Nations in 2015 with the mission: "A blueprint to achieve a better and more sustainable future for all by 2030", has defined the Sustainable Development Goal 4 (SDG 4) as: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." Findings of the Global Education Monitoring Report (2016) show that, "Equitable, good quality education and lifelong learning are vital to securing sustainable futures for all. How and what people learn not only influences their knowledge, skills, attitudes and world views, but also their respect for each other, along with investment and research choices that affect coming generations." The report further describes that SDG 4, which is about education, is also closely linked to the proposed achievement of 16 other goals of SDG 2030.

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Higher Education Institutions (HEIs) have the prime responsibility to prepare individuals to serve humanity by providing value-imbued holistic education. They will fail to achieve their purpose in the absence of delivering quality education driven by values and ethical practices. There are instances of growing world-wide corruption and academic frauds, degree mills, intolerance, social unrest, misconduct, erosion of human values, and other disturbing practices. UNESCO, OECD, Transparency International and other international agencies are raising their concern about threat to the quality of education across the globe. In spite of a wide range of measures taken to curb this menace, the magnitude of such problems is continuously on the rise. Labelle (2013) states that, "Corruption in education acts as a dangerous barrier to high-quality education and social and economic development. It jeopardises the academic benefits of higher education institutions and may even lead to the reputational collapse of a country's entire higher education system." The demand for growing number of students in higher education and the cross-border movement of international students will further necessitate the need for fair practices and quality education.

There is an urgent need to address the threat to quality higher education and formulate suitable strategies to ensure that educational institutions are able to achieve the purpose of their existence. It is essential to foster a culture of values and ethical practices for quality and excellence in higher education. The objective is to address the emerging challenges in higher education, values and ethics in quality education, and provide strategic implications for HEIs and regulatory bodies.

CORRUPTION AND FRAUD IN HIGHER EDUCATION

There is widespread corruption in the education sector. Mohamedbhai (2016) observes, "Corruption infected higher education has been known for decades, what is perhaps not realized is its magnitude, its extent and that it is constantly growing. Corruption in higher education has become global and affects the developed and the developing world equally." It is deep-rooted and affecting every aspect of education. Transparency International Report on Corruption in Education (2013) reveals, "Various forms of corruption include illicit payments in recruitment and admissions, nepotism in tenured postings, bribery in on-campus accommodation and grading, political and corporate undue influence in research, plagiarism, ghost authorship, and editorial misconduct in academic journals, degree, diploma and accreditation mills, the manipulation of job placement data, and corruption in degree recognition in

cross-border education." Corruption causes damage to society in a variety of ways. The Report further stated, "The young are the first victims of corruption in education, and this can affect the integrity and dignity of the person for life, as well as society at large. Not only society but even human life can be endangered by fake or untrained doctors, judges or engineers, or by bogus scientific research carried out by corrupt academics." The extent of damage is beyond imagination and will affect future generations. There is an urgent call to fight this menace to humanity.

ROLE OF VALUES AND ETHICS IN HIGHER EDUCATION

Institutions of higher education play an integral part in social and economic development of any nation by preparing young minds to accept different responsibilities. They not only provide required knowledge and skills for career, but also provide for holistic development of individuals. Pillay (2013) opines, "Education, in addition to being an entitlement, is instrumental in promoting development, social justice and other human rights.... and encourages a spirit of common and shared responsibility for our planet and for humanity. The values imparted through education are perhaps its most important product." Aristotle has rightly said, "Educating the mind without educating the heart is no education at all." The highest education is that which does not merely give us information, but makes our life in harmony with all existence. Formation of character in youth is one of the primary purposes of any University. In this perspective the Founder of Banaras Hindu University, Mahamana Pandit Madan Mohan Malviya Ji said, "A teaching university would but half perform its function if it does not seek to develop the heart-power of its scholars with the same solicitude with which it develops their brain-power…. the university would seek not merely to turn out men as engineers, scientists, doctors, merchants, theologists, but also as men of high character, probity and honour, whose conduct through life would show that they bear the hallmark of a great university." Value-based holistic education has to be the prime goal of HEIs.

Value orientation and ethical practices must be reflected in all the activities performed in educational institutions including core academic functions such as, teaching-learning, research and innovation, governance, and other activities. There should be a genuine concern, respect, and sensitivity towards the environment and for everyone and everything on the living planet including rivers and mountains, and animals, birds, plants, and other living organisms. The burgeoning problems related to society, nation, humanity, and planet can be effectively handled by value-strong individuals. India has a rich

tradition of value-based holistic education. The universities of Takshashila and Nalanda, which had been global centres of higher education in ancient India, were known for their quality education. Quality took a different form in such institutions. They followed the model of interactive residential education where the first step was building a bond between the teacher and the taught, through a process of dialogue for the inculcation of universal values and for building character. All the systems and processes of these universities were transparent, interactive, and participative, governed by well-defined codes of conduct and sound ethical practices.

FRAMEWORK FOR VALUES AND ETHICS FOR QUALITY HIGHER EDUCATION

In view of emerging challenges in higher education there is a need to ensure integration of value orientation and ethical practices in all round activities performed within any institution of higher education. It is only through a strong foundation of value- and ethics-based culture of performance that any educational institution can achieve its purpose of existence. The strategy for incorporating values and ethics in educational systems and processes must have clarity of focus, selection of right elements, and effective implementation tools (Fig. 1).

Strategic Core

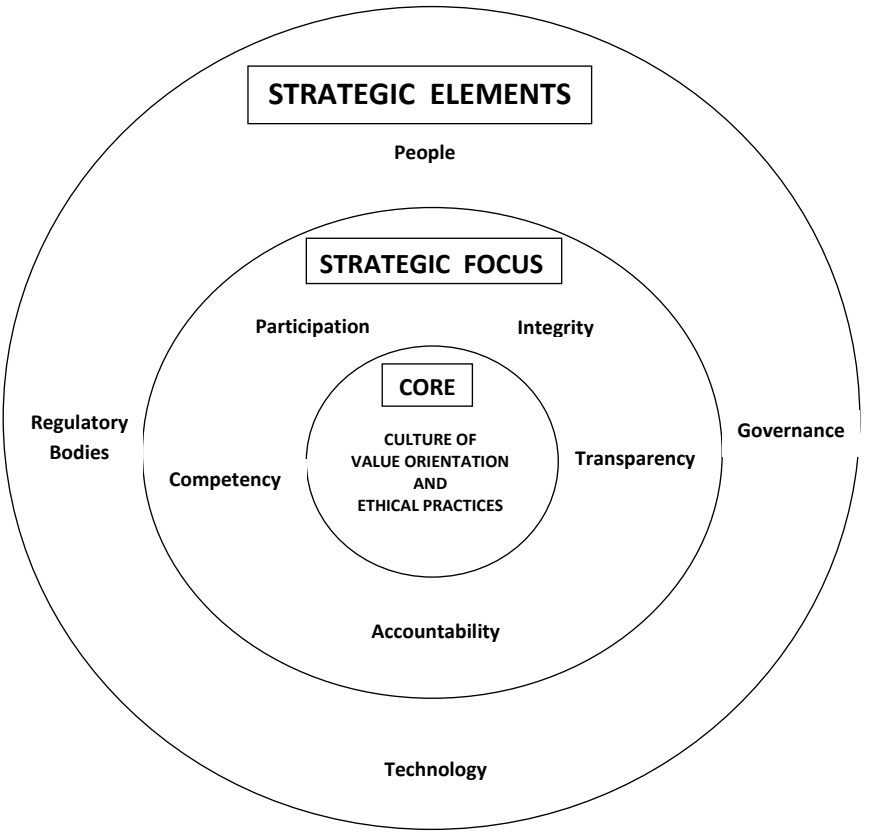
The heart of strategic framework for quality higher education is the culture of value orientation and ethical practices. Leadership of the institutions assume the prime responsibility for defining value-based vision and mission, which act as the guiding spirit for institutional goals, action plans, and performances. The culture of an institution has great impact on the conduct and behaviour of every individual — students, teachers, and staff members, and significantly contributes to image building.

Strategic Focus

Quality higher education must focus on five critical dimensions: Integrity, Transparency, Accountability, Competency, and Participation.

***Integrity*:** The first and foremost requirement is of Educational or Academic Integrity. Milovanovitch (2013) defines integrity in educational systems as, "The consistent application of actions, values, methods and principles that lead to equitable access to education, good-quality education, the professional treatment of staff and sound management of resources and the effective

Fig. 1
Values and Ethics for Quality Higher Education



prevention and detection of malpractice/corruption." Every individual must reflect values of integrity in his or her area of performance in the institution. Bretag (2013) describes academic integrity, according to the International Centre for Academic Integrity (ICAI), which encompasses the five values: honesty, trust, respect, fairness, and responsibility. It has to ensure that research, teaching, and learning are conducted honestly and fairly by faculty, staff, and students alike. It is equally important that people involved at all the levels in the educational system must reflect the highest level of integrity in areas of their performance. The Integrity Pledge introduced by Transparency International can also be effectively used to ensure educational integrity.

***Transparency*:** It is widely reported that transparency is one of the most effective weapons in fighting fraud and corruption. High financial stakes in the form of grants and other means of financial resources mobilization is a

major reason for corruption in higher education. The IIEP Policy Forum on Planning Higher Education Integrity (2015) brought together nearly 60 higher education experts and stakeholders from around the world to discuss recent and innovative initiatives aimed at improving transparency and reducing opportunities for fraud or corruption at the university level. Labelle (*op. cit.*) also asserts, "The roots of corrupt practices lie in a lack of transparency and accountability. The inability to access information prevents communities and individuals from being able to monitor budgets and demand answers from those in power." It calls for developing and implementing all systems and process with a view to provide openness and access to all the relevant information.

***Accountability*:** Hallak and Poisson (2007) suggest, "Creating and maintaining transparent regulatory systems, strengthening management capacities for greater accountability and enhancing ownership of the management process can help build a virtuous triangle that is favourable to educational system free from corruption." It is important to carry out the job as defined and specified for a particular purpose. Who is responsible for doing what, when, where, how, and for whom, needs to be clearly spelt out in policy, rules, procedures, or any other code of conduct. Compliance to such specified practices has to be carefully monitored to identify a person responsible for any lapses in performance.

***Participation*:** Greater participation of all the stakeholders at various levels in the institutions of higher education can build trust and confidence in the educational systems. Since quality is the responsibility of everyone in the institutions, it calls for empowering individuals to have greater say in decision making. Involvement of faculty, students, and staff in different decision-making bodies will enhance access to information and reduce the risk of corruption in the system. Zaman (2013) reports, "The Integrity Pledge is a micro-level social accountability tool built on the premise that ensuring people's participation in planning, budgeting, implementation and monitoring the process of service delivery can significantly reduce corruption at all stages." It can be effectively used in HEIs.

***Competency*:** Every individual responsible for a specific task must possess the required level of competency in terms of knowledge, skills, and expertise in the desired area of performance. Incompetency breeds corruption. Competent people do not resort to shortcuts for performing their tasks and achieving results. They exude self-confidence and develop self-respect, which further

prevents them to resort to any unethical measures. Institutions must not only recruit the best talent but also provide opportunities for regular upgradation and for developing core competencies.

Strategic Elements

The key elements for developing the strategic framework include: People (Academic and administrative staff and students, among others), Governance, Technology, and Regulatory Bodies.

***People*:** They are the key elements responsible for knowledge creation, advancement and dissemination, and quality higher education. Personal integrity and competence are the essential requirement for each individual involved in higher education. People should be strong in both values and competencies. Teachers, students, staff, and people involved in administrative processes must reflect the highest standards of ethical practices in all their endeavours.

***Governance*:** Quality higher education calls for well-defined, robust, and transparent systems, process, and practices for educational institutions. Well-defined organizational hierarchies, lines of interaction, policies, rules, legal or statutory requirements, procedures and other details help in increasing transparency and accountability. Institutions must evolve to reflect good governance practices.

Technology: Use of technology can help immensely to ensure quality in higher education. Information Communication Technology (ICT) enables ease of access to information and contributes to enhancing transparency in the process. Institutional websites, Educational Management Information Systems, social media, and mobile applications are very effective tools for the implementation and monitoring of educational activities. Judicious use of advancements in technology will continue to enhance quality in higher education.

***Regulatory Bodies*:** Public and private, international and national regulatory bodies such as UNESCO, OECD, Transparency International, Quality Assurance Agencies of different countries, Ministries of Education, University Grants Commissions, and other agencies will continue to play a key role in the planning, and implementation and control of quality in Higher Education. They act as guardians for the adoption of value-oriented ethical practices in the educational processes and systems.

Strategic Implementation

Effective implementation will require preparing institutions for value orientation and ethical practices in higher education. All the strategic elements need to be intelligently woven in the action plans. It also calls for undertaking a series of measures which would include: Defining value-based vision and mission statements of the institution; promoting a culture of value orientation and ethical activities in all areas of performance; developing and adhering to value policy and code of conduct for students, teachers and staff; integrity pledge; establishing centres for values and ethics for education, promotion, and training for the integration of values and ethics in teaching, research and governance; sensitization for sustainable development activities; value audits; and developing networks for sharing of practices. Implementing these measures demands strong leadership and committed efforts. Effective leadership will be able to integrate each element of the educational system for achieving the goals of higher education.

PROMOTION OF VALUES AND ETHICAL PRACTICES BY THE UNIVERSITY GRANTS COMMISSION (UGC)

As an apex body and key regulator of higher education in India, UGC plays a vital role in promoting values and ethical practices through a series of initiatives aimed at all the important stakeholders. In order to inculcate values and ethical practices among the students certain specific programmes are available:

- ***Deeksharambh*** (UGC 2019b), a student-induction programme, which includes mentoring sessions on universal human values.
- ***Jeevan Kaushal*** (UGC 2019e), an exclusive course on Life Skills, has been designed, which has modules on human values encompassing truth, love, compassion, peace, non-violence, righteousness, service, and renunciation.
- ***Guru Dakshata*** (UGC 2019d), to engage the faculty members in this mission, this Faculty Induction Programme includes modules on academic integrity, universal values and professional ethics, constitutional values, human rights and fundamental duties, environmental consciousness and sustainable development goals.

With a mission to address ethical practices in research and publications, UGC has taken major initiatives with:

- ***CARE*** — Consortium for Academic Research and Ethics (UGC 2019a), and

- ***GARP*** — Guidance Document on Good Academic and Research Practices (Patwardhan et al., 2020). Both these initiatives are aimed at promoting quality, impactful, ethical research and publications by creating awareness, promoting ethical practices, training on academic integrity and monitoring academic processes and outcomes.

  As an important regulatory initiative UGC has included Code of Professional Ethics for Vice Chancellor, Pro-Vice-Chancellor/Rector, Principal/Directors as well as teacher of universities and colleges as a chapter in Governance in Higher Education: Handbook for Vice Chancellors (UGC 2019c), as well as in UGC Regulations on Minimum Qualifications for Appointment of Teachers and Other Academic Staff in Universities and Colleges and Other Measures for the Maintenance of Standards in Higher Education, 2018.

- ***Mulya Pravah*** (UGC 2019f): As a big leap towards creating a culture, systems, and processes of values and ethical practices, UGC has brought out a policy document. It is major step towards providing a guiding framework with required details and methodology for the inculcation of human values and professional ethics in higher education. It suggests core values such as: integrity, trusteeship, harmony, accountability, inclusiveness, commitment, respectfulness, belongingness, and sustainability, to be adopted by all in the HEIs.

  These pathbreaking initiatives of UGC are expected to bring about major reforms in quality higher education through the promotion of values and ethical practices.

CONCLUSION

With the growing importance of education for a better planet and life, it becomes imperative to ensure value orientation and ethical practices in achieving quality higher education. Reforms are required to fight with the evils of corruption and frauds in educational systems. We have to recognize and face the challenges in higher education and ensure value-based knowledge creation, advancement, and dissemination. It places greater emphasis on sharpening our focus on integrity, transparency, accountability, competency, and participation in our quality orientation efforts. We need to formulate a well-crafted strategy involving people, governance, technology and regulatory body to achieve the goals of higher education. Inclusion of "Values and Ethical Practices", in the core ideology and fabric of HEIs will definitely provide a strong momentum to quality initiatives and good governance. Our regulatory

bodies and networks will have to adopt a much wider role in sharing their wisdom and practices for evolving value-based ethical practices for quality higher education.

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STUDENTS' INDUCTION PROGRAMME IN HIGHER EDUCATION INSTITUTES

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THE IMPORTANCE OF AN INDUCTION PROGRAMME

"He, who opens a school door, closes a prison."

Victor Hugo

This statement remains equally if not more, relevant in the present times as the importance of educating an individual cannot be overemphasized. Institutes of higher education play a very important role in this direction in imparting the technical and academic knowledge, which would equip a student to face the world. But then, as John Dewey has rightly said, "Education is not preparation for life; education is life itself."

Therefore, when a student steps into the corridors of an institution, there are mixed feelings. On the one hand — hope, curiosity, enthusiasm, and a thrill of the newly-acquired independence; on the other hand — anxiety, apprehension of the unknown, and the discomfort of facing a new environment, which is particularly felt by the relatively shy and introvert pupils. It therefore, becomes most essential to familiarize students to the new atmosphere in which they suddenly find themselves, because the slightest negligence in addressing this sensitive need can have dire consequences. A student will learn and comprehend the various details of a curriculum only if the overall atmosphere of the institution is conducive to this process, and here lies the importance of conducting an induction programme for them.

MEANING AND SIGNIFICANCE OF INDUCTION

Students entering a Higher Education Institute (HEI) have one thing in common — they belong to almost the same age group and are affected more or less, by the same emotions, motivations, and considerations. They find themselves on the threshold of adulthood, but are also driven by the youthful energy, which could turn them into leaders, renegades, or rebels — depending in which direction they channelize their energy.

Induction provides positive and dynamic direction to the energy, and simultaneously helps students to be comfortable with the institution, which is

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going to be their home for the next few years. This is crucial because it is here that they can get an opportunity to blossom, leave the stigmas of past failures behind, and get rid of any justified or unjustified sense of guilt that they may have carried.

This is not an easy task, and can be accomplished only with the wholehearted support and sincere participation of the teachers.

> *"Everyone who remembers his own education remembers teachers, not methods and techniques. The teacher is the heart of the educational system."*
>
> *Sydney Hook*

Teachers have the dual responsibility of introducing the students to the ethos and culture of the institution they join, encourage them towards self-exploration, and discovering the ultimate and larger purpose of life.

This is also the time when these students have to make new friends, develop healthy relationships with the teachers and staff, and gradually understand their roles as individuals and as group members. To help build these bridges, the teacher dons the mantle of a mentor.

THE INDUCTION PROCESS

To make students feel at home with the new environment, complete familiarization with the institutional policies, processes, practices, culture and values is required. It is at this time that the process of developing a bond with the institution commences — which can lead to an everlasting sense of belonging that would, in the long run, be beneficial for all concerned.

Coming from different social, cultural, and economic backgrounds, students are a heterogeneous group. During the process of acclimatization, none of them should feel ignored or relegated. To achieve this challenging aim, they need to be divided into smaller groups — each such group allotted to a teacher, who shall be the mentor for the entire duration of the induction programme.

Effective communication is the key to "break the ice" among individuals. An effective induction programme has to include the following four aspects:

Socializing: Interacting with other new students, seniors, students unions, and non-teaching staff, among others.

Associating: Visits to various departments of the college and university, important places on campus; getting acquainted with the town/city.

Governing: Knowing about the rules and regulations, student support, and other systems.

Experiencing: Getting an insight into the area of study through subject lectures, and study skills.

But education remains incomplete if it fails to turn out a value-oriented citizen.

> *"Education makes a greater difference between man and man, than nature has made between man and brute. The virtues and powers to which men may be trained, by early education and constant discipline, are truly sublime and astonishing."*
>
> *John Adams*

The programme has to be designed to develop sensitivity towards various issues of social relevance, and for imbibing human values among the students. Only then can complete, responsible, and righteous citizens be entrusted to the nation.

OBJECTIVES AND GOALS OF THE PROGRAMME

Important Objectives: The induction programme aims at:

1. Familiarizing students to the new environment, while helping them rediscover themselves and bringing out the best.
2. Inculcating such human values that will enrich their personality, making them assets for society.

Focused Activities: The goals can be achieved by including two different categories of activities that will help students:

1. Overcome their hesitation, open up their thoughts and feelings, and encourage them to experiment with their creativity.
2. Understand the importance of the human values.

Extra-curricular activities that would help to create an atmosphere of all-round interest and achieve the first objective:

- Creative arts — imaginative drawing and sketching; depicting stories through sketches; representing abstract qualities through shapes; making artistic representation of important people in life, and so on. Art is a universal language that we understand and use to communicate. It helps to express ourselves and communicate across time and space. We have an

inherent drive to create and understand visual imagery. The Arts help in developing creativity, academic performance, motor skills, confidence, visual learning, decision making, perseverance, and focus.

- Performing arts — theatre helps in overcoming stage fright, improving concentration, developing observation and listening skills, and improvizing. Theatre activities are an important tool for preparing students to live and work in a world that is increasingly team-oriented. Theatre helps to develop personality traits such as tolerance, cooperation and collaboration, problem-solving, sense of fun, trust, improved memory, social awareness, aesthetic appreciation, self-confidence, and empathy.
- Physical fitness and/or yoga — simple exercises for a healthy mind and body, physical activities of moderate or vigorous intensity are a daily requirement. Physical activity simply means adequate movement of the body that burns enough energy for health benefits. Walking, jogging, climbing stairs, and sports are all good examples of outdoor activities.
- Literary activities — spontaneous writing, group story narration, essay writing, debates, elocutions, extempore declamations, are all invaluable social yet intellectual activities. Interaction and communication enable us to express our emotions and thoughts, share ideas, develop new relationships, and strengthen bonds.
- Film appreciation — understanding layered cinema by delving deeper into the elements to be observed in a film; impact on the audience; the role of cinema in influencing society.
- Lectures by eminent people.
- Familiarization with the department and its staff.
- Visits to prominent places in the institution and city.
- Interactions with seniors, alumni, or student unions.

The above activities would promote enough interaction and generate adequate interest among the students to gradually ensure their uninhibited participation, which is the essential forerunner to the second set of activities designed for inculcating human values.

Mentoring: The success of this programme depends on the sincerity with which teachers perform their roles as mentors, because it will help students to connect with the faculty and set up healthy relationship with them.

Students have to be divided into groups of about 15-20 students with one teacher assigned as a mentor to each group. The mentor has to gradually build-up a level of confidence in the group, wherein students feel free to speak, exchange their views, and discuss various aspects of life. Conversation and interaction should be directed to the importance of human values, without which a fulfilling and noble life is not possible. As students get involved in these discussions, they will get to explore themselves and experience the joy of learning. A teacher may effectively use value clarification strategies in the interactive discussions. An understanding of the concept of values is imperative at this stage.

VALUES: MEANING AND TYPES

Derived from the Latin word 'Valerie', meaning "to be strong and vigorous", 'value' as a noun, indicates personal belief and attitude, in a broad sense. In the opinion of scholars, the word 'value', as a verb, could indicate appraising, estimating, respecting, or cherishing something as very important and dear.

Values are classified in various ways: personal and social, moral and cultural, traditional and modern, spiritual and religious. Such classifications include values such as compassion, cooperation, courage, courtesy, curiosity, discipline, duty, equality, integrity, justice, patriotism, social service, sincerity, and tolerance.

HUMAN VALUES

These are intrinsic to every human being and include faith, honesty, truth, integrity, love, and peace. Such values help to bring out the fundamental goodness of all human beings and of society at large.

Values such as gratitude and sympathy can only develop when our expectations from others can be weighed against what we do in reciprocation in fulfilling the expectations of others. Material and non-material aspirations of individuals have to be analysed for underlining the significance of this. And for this, value clarification is an important strategy.

Meaning of Value Clarification

Our values are influenced by our personal experiences, principles or priorities within the family, religious beliefs, and social norms. Based on these, we perceive certain acts or principles as right and others as wrong. With value clarification we can understand that behaviour may not necessarily always be good or bad, but it may differ with time and space. The same action may seem

wise at an occasion and foolish at another, according to the circumstances of each case.

Importance of Value Clarification

"It's not hard to make decisions when you know what your values are."

Roy E. Disney

Value clarification provides the opportunity to reflect on personal and moral dilemmas and analyse them rationally. It enables us to relate our thoughts and feelings and become more aware of our values. Value clarification in education plays a very important role in the moral development of a student. This in turn, is significant for those who are confused about their values, and are thus unable to perform up to full potential. Once values are clarified in the sphere of education, students are can make better and quicker decisions, think freely, explore their selves, and become more tolerant and confident.

Strategy of Value Clarification

The objective is not to teach specific values, but to make students aware of personally-held values and how their values compare with those of friends, adults, different groups in society, and even other societies in other times. As this awareness increases, students will reconsider and perhaps modify poorly-founded values and at the same time, confidently hold on to values that stand the test of review and comparison.

Value clarification as an integral part of our education system helps students to identify closely with, and develop and insight to, their core personality; directs them on the right path to become the type of person they want to be. Students become their own role models. . With clarity on values, students can strengthen and integrate them into their personality. Clarification of values, therefore helps students to create personal goals, set priorities, and manage time. Mentors play an important role in shaping the students as responsible citizens of a nation.

1. Value Clarification as an Exercise

Students may find it difficult to determine or to identify their core values. For all such instances, a teacher may use brainstorming activities. Although value clarification activities may be conducted in a variety of forms, teachers need to follow some basic procedures:

- Begin the session with "opening up" activities that focus on low risk issues.

- Design activities that require students to overtly and explicitly indicate their position or viewpoint on an issue. Accept the responses of students without any evaluation and judgement. Discourage any attempts by students to challenge or mock each other's position.
- Ask students to explain or provide reasons for holding a specific value position. This is the clarification aspect of the strategy.
- As far as possible, relate the activities to issues that have historical importance or are linked to personal, social, or political concerns.

With such an exercise, students will better understand their thoughts, feelings, and behaviour.

2. Process of Value Clarification

a) *Choosing Freely*

Students choices should be based only on what they feel and think and not under any pressure from elders or their peers. But, to affirm their point of view, mentors may ask questions like : "Where or when did you got that idea to begin with?" or "Are you the only one among your friends who feels this way?"

b) *Choosing From Alternatives*

Students are presented with different types of information. They need to critically analyse and choose wisely from the flood of information provided. They have to explore various alternatives before arriving at any conclusions. Sample questions that a mentor may ask to affirm this, could be:

- What reasons do you have for your choice? or
- How long did you think about this problem before you decided?

c) Choosing After Considering Consequences

Students reflect on their thought process, weigh the views expressed by others, and make considered choices. To affirm, mentors may ask:

- What will happen if this choice is implemented? What is the expected outcome if another choice is implemented?" or
- What is good or unique about this choice? What could be good or unique about the other choices?

d) *Prizing and Cherishing*

Students need to introspect and be aware of the values that they consider worthy and important. This is essential because then only is it possible for

them to identify the values that will ultimately form their core value-systems and build up their personalities. Mentors could ask :

- Are you happy about feeling this way? or
- Why is this important to you?

e) *Publicly Affirming*

Different strategies such as completing (incomplete) sentences, or answering controversial questions will help students to clarify their thoughts and views. Mentors could ask sample questions for affirming the students' opinions:

- Are you be willing to tell the class how you feel? or
- Should someone who feels as you do, publicly share how he or she feels?

f) Acting

After choosing what they consider relevant, motivate students to demonstrate their beliefs. They can be motivated through different activities. For affirmation, mentors can ask:

- What will you do about your choice? What will you do next? or
- Are you interested in joining your peers who think the same way as you do?

g) Acting with a Pattern, Consistency and Repetition

After they have clarified their values, students, have to be motivated to reflect the values that they 'choose' to 'cherish'. This is the final step in which they act with a definite pattern, consistency, and willingness in repeating what they cherish. To affirm, mentors may ask:

- Have you done anything about it? Will you do it again? or
- Would you like to get other people interested in this?

Conclusion: Under the 'Values Clarification Approach' students are encouraged to clarify and compare their own values with others and uphold the values that they find to be meaningful and useful. There is no pressure of pre-conceived notions on the choice of good values.

Mentors "break the ice" using very simple issues and then move on to more thought-provoking ones. Mentors can tell a story or incident and ask the students to share their views. They can play survival games or present moral dilemmas in which students are encouraged to choose between two equally important options.

Mentors can discuss issues such students' aspirations, family expectations, gratitude, peer pressure, prosperity, and relationships, but ensure that they do not impose personal views on morality and virtue. For the students to always feel free to express their views, mentors refrain from making judgemental comments There is the added responsibility of ensuring no student makes fun of any other student's comments or views. Sometimes, a handful of students tend to dominate or influence the views of other students. A preventive measure for this is to ask each student to clarify why he or she has given more significance to some values over others; or explain why he or she has accepted some values and rejected others.

Acting as facilitators, mentors provide suitable conditions and situations to help students to become aware of the values which they consider to be valid and worthwhile.

3. Pre-requisites for the Value Clarification Process

For a successful value clarification approach, it is essential that:

- Students are given the opportunity to freely and fearlessly express their views on different issues presented to them.
- They are made aware of the need to be patient listeners when others are expressing their views. While each individual has the freedom to speak, he or she has to also listen carefully to what others say, without being biased and self-centred.
- Positive and thought-provoking interactions take place between mentors and students, and among the students.
- No single person or group of persons dominates the discussion in a manner that intimidates others, making them afraid to speak.
- Students do not get overwhelmed or influenced by others impelling them to accept their views merely to avoid arguments.
- Mentors maintain the decorum of the sessions and ensure that students feel free to express views. Students must not remain aloof or feel unable to participate in discussions.
- Mentors do not moralize.
- Students have the opportunity to critically analyse, clarify, and develop values that they consider worthwhile.

4. Inculcating Important Human Values

The process of value clarification indicates a good strategy for inculcating values. This can be used effectively by teachers for helping students to identify

and clarify the values that they cherish. There are several values, which are essential for individuals to create a humane society. During student induction, prominent values that are significant and relevant for the student community and its future, may be discussed and highlighted. The following examples of selected values and the process for their value clarification are significant:

a) Aspirations and Family Expectations

Aspirations are abstract statements or values and beliefs that students express regarding future educational and/or employment plans. 'Aspiration' is different to 'Ambition'. While ambition is more of a desire for achieving success, 'Aspiration' is more about becoming better and capable, and focused on a higher accomplishment. This difference should be brought out during discussion.

Students' aspirations and family expectations need to be discussed with students. Questions such as: What I wish to be? What kind of professional career and personal goals do I have? How do I project myself? What I wish to do in my life through a career or otherwise? All such questions are appropriate starters. Thereafter, students can continue to interact on: Understanding goals, desires, feelings; reflecting on actions and /or behaviour. Students need clarity in terms of proper goal setting. The concepts of balanced growth, material growth, physical growth, relationships and giving back to society need to be discussed.

To understand family expectations students are encouraged to talk about their family, and their expectations from their family members. Teachers can present a dilemma or issue about family expectations or aspirations and cite incidents from real life to utilize the value clarification process for further in-depth discussion.

b) Gratitude

Gratitude is an emotion that expresses appreciation for what one has. It recognizes a value independent of its monetary worth. When spontaneously generated from within, gratitude is an affirmation of goodness.

Students should identify people who have done anything for them in the past or are doing anything for them presently; identify those who have helped both directly and indirectly. This may include people from family, society, school, and elsewhere. This helps to establish that whatever or wherever they are today

is a result of efforts of several people around us. The next connected thought is, "How many people have I helped?" Students must reflect on both their past and present experiences and candidly ask, "How many people am I helping now?" Most students might realize that they are actually doing very little for others.

During the discussion teachers may present a dilemma or issue about gratitude, citing incidences from real life and use the value clarification process for further in-depth discussion. The discussion needs to cover the ground along the lines that gratitude is a natural phenomenon, which has to come from the core of the heart. Extending help to others is a way of expressing gratitude for what we have in our lives.

c) Peer Pressure

Peer Pressure is the influence of a Peer Group that compels a person to change attitudes, values, behaviours, or action to conform to the Peer Group. Peers play a large role in the social and emotional development of students and adolescents. Their influence begins at an early age and increases through the teenage. Responding to peer pressure is part of human nature but some people are more likely to give in, and others are able to resist and stand their ground. Peer pressure is not always negative. But the objective is to be self-organized. It is important to discuss how to differentiate between positive and negative peer pressure. How to utilize peer pressure for self-development? How to avoid it if it is negative?

Teachers may raise an issue or present a dilemma about peer pressure citing incidences from real life and use the value clarification process for further in-depth discussion**.** As students listen to experiences of their fellow students, an understanding to withstand peer pressure and take courageous decisions automatically develop.

d) Prosperity

Generally, prosperity is associated with physical needs; we are prosperous when we have more than our actual physical needs. The teacher elucidates the meaning of prosperity to students by elaborating various types of needs, and most importantly point of the difference between the *needs of the self* and the *needs of the body*, and that one cannot be fulfilled by the other. To know and see the difference between *needs* and *wants* is extremely important. Teachers can pose this very interesting perspective or question "Is there any relationship

between prosperity and happiness"? Generate a discussion around utilizing surplus wealth for the benefit of society. The true meaning of prosperity will dawn on the students in due course, as they are able to analyse the role of money in life, and learn to differentiate between the momentary materialistic affluence and the genuine and long-lasting sense of well-being.

e) *Relationship in Family*

A family constitutes people who are related to each other and share an emotional bond possibly with similar values. Family members can be related by birth, marriage, or adoption. The immediate family includes parents, siblings, spouse, and children.

Seven Relationships

- Parents-children (*mata-pita* and *putra-putri*)
- Husband-wife (*pati-patni*)
- Brother–sister (*bhai-behan*)
- Teacher-student (*guru-shishya*)
- Friend (*mitra*)
- Companion-assistant at workplace (*saathi-sahayogi*)
- System related (*vyavasthaagata sambandh*)

It is important to discuss the need of various relationships and the responsibilities in each. The mentor can initiate a discussion on how good relations are a key parameter for happiness in life. Relationships thrive on 'giving' and not on just 'taking'. Deliberations on feelings such as gratitude and trust help students to be aware of the significance of relationships and to be sensitive towards others.

THE TEACHER AS A MENTOR

> *"The best teacher is the one who suggests rather than dogmatize, and inspires his listener with the wish to teach himself."*
>
> *Edward Bulwar-Lytton*

This statement assumes immense significance in the context of the sessions on human values that mentors conduct. Teachers must never appear to be prescribing a certain thought process or a preferred course of action, but let this emerge as naturally as possible. Thus, there would be no dictums of "do's and don'ts", but only dialogues and discussions. If mentors substantiate such discussions by sharing personal experiences, they boost the confidence levels

of the participants, who would then muster the courage to speak about their experiences.

It may appear that these two sets of activities are distinct from each other, but they are complementary. For example, if a student discusses his or her aspirations in the session on 'Aspiration' under human values, the same emotion is expressed when he or she sketches the feeling on paper. Similarly, virtues such as compassion and gratitude find a place in literary activities of writing anecdotes, experiences and stories. Students discuss camaraderie, trust, and respect in a session on human values, and later implement it when they work as a team for writing, casting, and enacting a play.

PLANNING AND TIME TABLE

The induction programme should ideally be scheduled at the beginning of an academic session, before regular classes start. It could be designed to cover an entire week, the activities being divided between morning and afternoon sessions.

The morning sessions could have various types of activities or interactions, the afternoon sessions could be dedicated to deliberations on human values.

Mentoring, must not be ended abruptly with the conclusion of the induction programme. It is an ongoing process, which has to continue for the entire duration of the course, assisting students through interaction on contemporary concerns and helping them to develop their competencies and talents to be successful in their future ventures.

PARTNERS IN INDUCTION

1. Newly-admitted students
2. Head of the institution
3. Important functionaries
4. Faculty mentors
5. Students council/association
6. Selected senior students (student guides)
7. Selected alumni
8. Civil society
9. Invited distinguished people

PREPARATIONS BEFORE INDUCTION

Induction is a well-planned process for introducing the new students to higher education, to the institutional culture. Before it is conducted, it is essential to plan all the activities in advance. The following preparations are recommended:

1. Create a hyper-link on the induction of new students on the institution's web-site giving information about the induction, detailed schedule, provision for daily reporting, feedback, etc.
2. Organize a joint meeting of all the partners involved in influencing the process of education. Get full support from the head of the institution and top management.
3. Inform new students that the induction is a mandatory non-credit or credit course for which a certificate will be issued by the institution.
4. Ensure compulsory participation by teachers and other partners.
5. Share detailed scheduling of the activities based on the nature, size, and location of the institution.
6. Prepare the Induction Policy and charter for students, stating their responsibilities.
7. Constitute an Induction Committee chaired by the Dean, or the Vice Principal, or a senior teacher, which will prepare the detailed induction programme in consultation with the head of the institution, facilitate in conducting, monitoring, and coordinating the whole induction programme.
8. Conduct a half-day workshop for partners on how to proceed with induction.
9. Appoint a mentor-coordinator before the induction programme begins. His/her responsibility is to form mentor groups, ensure smooth running of the universal human values group discussions, and hold periodic meetings for mentors.
10. Organize a training programme for the faculty on how to mentor students, based on universal human values, and imparting holistic education and a larger vision of life.

FOLLOW UP AFTER INDUCTION

What would be the follow up programme after the formal Student Induction Programme (SIP)? The groups formed have to function as a mentor-mentee

network. Student should feel free to approach their faculty mentor or student guide, if facing any kind of problem, whether academic or financial or psychological. For every ten undergraduate first-year students, there would be a senior student as a student guide, and for every twenty students, there would be a faculty mentor. Such groups need to remain functional for the entire duration of stay of students in the institution. The students-teachers groups would be from the same school or department. Having said that, it is good to mix students of different departments in the hostels, for example, giving them rooms in alphabetical order by name.

Follow Up: Same Semester

The mentor groups within the same semester need to meet with their faculty mentors for an hour every week, after the induction is over. This should be a scheduled meeting shown in the timetable. The groups are, of course, free to meet more often on their own. Faculty mentors could invite student groups to their respective home to tea or dinner. There could also be other group activities such as nature walk, etc.

Follow Up: Subsequent Semesters

It is useful to maintain continuity in subsequent semesters. At the start of the subsequent semesters, three days could be set aside for activities related to follow up. Show inspiring films, arrange collective artwork and cultural programme, conduct group discussions, and organize lectures by eminent people. Subsequently, group discussions be arranged once a month.

RECOMMENDED ACTIONS

Recommended actions during the SIP:

- Set objectives for the induction programme
- Make induction a team effort
- Prepare a well-structured induction programme
- Provide a timetable of events
- Have induction co-ordinators for all the incoming undergraduate/post-graduate students
- Generate opportunities for active engagement
- Make programmes student-centred, and respond to diversity
- Incorporate icebreaking activities
- Reduce lectures

- Provide opportunities for group events
- Include creative and performing arts and literary activities
- Ensure alumni-Industry expert interaction
- Use senior student-guides
- Give attention to stimulating early social integration of students amongst themselves and with faculty
- Update unit and course information as provided to students
- Circulate information on safety and security, health and hygiene facilities
- Promote environmental consciousness, human values
- Coordinate movie shows, clubsShare Information about sports and cultural opportunities
- Introduce NSS/NCC
- Collect feedback on the induction programme.

DEVI AHILYA VISHWAVIDYALAYA, INDORE (DAVV) : CASE STUDY

The Devi Ahilya University is a state university in Madhya Pradesh accredited A+ by NAAC. It has 29 teaching departments, which offer 195 undergraduate, postgraduate, and research programmes in 16 faculties catering to more than 11,500 regular students. More than 4000 students are admitted every year through a common admission test and other suitable processes. For the new students a two-tier induction programme is carried out at the university.

Two-tier Induction Programme for Beginners

DAVV has always been in the forefront of creativity and excellence in education. Inducting new students with great care and affection has been a long-nurtured tradition here. Every year, in July- August the university organizes a special induction programme for all the newly admitted students. This programme is organized at two levels:

- Centralized Orientation Programme for all university teaching departments (UTDs).
- Department Level induction.

Level I: Orientation Programme for all UTDs

Objectives

- Acquaint the students with various centralized activities and facilities available at the university.

- Create a platform for direct interaction of the authorities of the university including the Vice Chancellor, Registrar, Dean Student Welfare, with the students.
- Make the students appreciate and value the opportunity that they have got for higher education.

Design of the "Level I" programme

The university level programme is conducted over half a day, organized in two batches separately for UG and PG students. Around 2000 students in each batch, from all departments gather in the central auditorium The programme consists of following activities:

- Kulgeet of the University is played. It highlights the importance of the holistic development of students. It also instills a sense of pride and oneness among students from all departments.
- A short film introducing the university is shown so that the students get to know the other departments and centralized facilities.
- Short motivational films of about 10 to 15 minutes are shown. These films carry small but very important messages such as — no ragging, follow traffic rules, the value of hard work, and never give up.
- A brief overview is given by the Dean Student's Affairs and Director Sports on the opportunities available for students such as youth festivals, sports events, scholarships.
- The Vice Chancellor addresses the students and encourages them to give their best performance and become assets for the university.
- A special guest from the District Administration or Police is invited to brief about law and order, drug abuse, traffic rules, etc.

This programme makes the students feel that the university as a whole cares for them and is concerned for their future.

Level II: Departmental Induction Programme

Objectives

- Familiarize the students with the faculty, classmates, and seniors and make them feel comfortable in the new environment.
- Acquaint the students with the discipline of study and opportunities at large.
- Mentor the students for understanding and exploring their potential and their responsibilities and become sensitive towards society.

The departmental level induction programme spans six days. The students represent diverse groups in terms of learning capacities and experience. During this period, the students are engaged in cohesive group-forming activities. They are encouraged to come out of their shells and become expressive. Mentors are assigned to groups of students. The mentors then interact with the students and assess their capabilities and existing skill sets.

The induction programme is designed with activities such as mentoring sessions; theatre, literary and artistic activities, film appreciation, alumni interaction, physical activities, visits, cultural activities, expert sessions, mentoring sessions etc. The faculty members and students participate with zeal in conducting the induction programme.

Design of the Programme "Level II"

The department level induction programme is designed on the guidelines given by UGC in its "Deeksharambha" programme and drawing from the suggestions of the UGC Committee on Mentoring for Human Values. This programme is intended to cover four key aspects known as SAGEsocializing, associating, governing, and experiencing. The specific activities are designed in two categories:

- Generic — for ice-breaking, familiarizing, information-sharing, and inspiring students
- Specific — comprising human values (HV) oriented activities

The departments organize various "generic sessions" depending on the nature of their programme. Some of the sessions are:

- *Know Your Programme* — The students are apprised of the relevant aspects of the programme in which they have taken admission: details of subjects, syllabi, attendance, discipline, timings, internships, placements, extra-curricular activities, alumni activities, projects, assignments, office assistance, general administration, amenities, and facilities provided by the institute.
- *Know the Ordinance 14* — The university programmes are governed under specific ordinance 14, which covers rules for CBCS, system of internal evaluation, final evaluation, grades attendance, etc.
- *Innovative Extra-curricular Sessions* — Departments exhibit a lot of creativity in organizing sessions, based on extra-curricular activities, aimed

at drawing students out of their shells: theatre, literary, sports, fine arts, film appreciation, yoga and meditation, quizzes, team-building games. Field visits to industry, old-age homes, and orphanages are also organized. All students are encouraged to participate in these activities. These sessions help in two ways — students mingle with each other and develop confidence, and teachers are able to identify students' talents so that they can be promoted in several inter-college activities in due course of time.

The second set of activities is woven around "Human Values":

- Values relevant to student life are identified. For example, gratitude, handling peer pressure, relationships, and family expectations, etc.
- Students are divided in groups and mentors are assigned to each group. Activities such as group discussions, role plays, and contemplative sessions are conducted by mentors.

The senior students along with faculty members organize this weeklong programme. This completely removes the inhibitions between seniors and juniors. The seniors automatically don the role of caring and mentoring their juniors. By the end of the induction, the entire new batch is charged up with enthusiasm and is cohesive and ready to start the session on a very positive note.

Outcome of the Two-tier Induction Programme

This two-tier induction programme has yielded encouraging results at DAVV. The department level induction has resulted in increased cohesiveness among classmates. It has also resulted into an environment of mutual support among junior and seniors leading to almost zero instances of ragging on campus. The strengthened bond between students and teachers has created a happy campus. Moreover, the activities that are performed during induction help in identifying skill sets of students who are then encouraged to participate in competitions' at inter college levels. In the last few years, DAVV has shown substantial increase in participation in youth festivals, sports, literary events, etc. The sense of belonging has increased in the students. There is increased inter-departmental cohesiveness among students of different UTDs. They identity with DAVV as a whole, not with just their respective departments. This has contributed to the brand image of DAVV.

Students Feedback

- If anyone from among us, the freshers, has to describe the whole experience at the induction ceremony of DAVV, then it would simply add up to just one word — Astounding.

- It was a really an entrancing event as we all got to introduce each other in the form of groups. The uniqueness about this induction week was the different activities designated to each day namely, theatre, fine arts, literary, physical and cinematic activities. The programme's last day was successfully concluded with cultural events in which students created a wonderful ambience with singing, dancing, recitation, plays, mono-act shows, a blend of some foot-tapping numbers. Everybody sat glued through the session as it presented ice-breaking activities.
- We were truly delighted and now look forward, with great expectation, that such super occasions will to be repeated encouraging the students to show their abilities frequently. Building a positive association with our mentor enabled us to feel comfortable in the surroundings.
- The second phase of the one-week long induction programme focused on the inter-personal session between the students and mentors. it takes efforts and assurance for a teacher to let the students know what we are in our own space and what we desire. Undoubtedly, the mentors valued those efforts of ours — discussing each and every aspect of a student's life, be it yearnings, objectives, desires (materialistic as well as non-materialistic), or past encounters. The mentors influenced us to comprehend that time after time we think little of the intensity of a touch, a smile, a kind word, a listening ear, a fair compliment, or the littlest demonstration of heeding, all of which can possibly turn a life around.
- The entire induction week made us contemplate upon the path, which would lead us to being successful in our careers as well as a responsible citizens of the nation.

Students Speak

- With the introduction speech constantly running in my mind, I arrived with butterflies in my stomach. But with the week-long chit-chat sessions and festivals, we had got to know our seniors, classmates, and the institution better. The first week was both exciting and full of apprehensions. But as it ended, I found in my immediate seniors the kind of good company I was looking for.
- I participated in activities related to literature and theatre. The engagements helped us to share our talent and learn about the qualities of our fellow classmates. The interactive session with alumni motivated us a great deal. Overall, it was a positive and enlightening experience and I made like-minded friends too.

Experts Feedback

- It was a very well-organized induction programme. It helped us to know the strengths of our students, which will help us in shaping and honing their skills in the future. Informal and deep discussions on various issues, especially on human values, were very encouraging. Many students became emotional while expressing their views. All students participated with full enthusiasm and serious alertness in the activities. Even within a short span of a few days, we could feel a distinct change in their perceptions towards what they consider important in life, particularly in the context of human values. We may introduce more innovative activities in the future to enrich the programme.
- It was possible for us to turn this programme into a genuinely structured and yet intimate series of activities because of the advantage of a compact group. This aspect however, may be more challenging in colleges or institutes, which are running a number of courses having sizeable number of students, but with fewer teachers to mentor them.

Alumni Feedback

- I would have loved such an induction programme back when I was a fresher. We were so lost, and we took time to open up to our seniors. This model will completely dissolve the senior-junior distance and foster the culture of a 'buddy' system.
- We are thankful to DAVV for inviting us to the Induction Session. We presented our play 'Pukar' in front of them. We found the freshers very interested in the activities that we shared with them. They were enthusiastic about the theatre activity and wanted to engage themselves more prominently with the current issues of the society and address them through dramatics.

Suggested Readings

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THE ROLE OF ICT IN HIGHER EDUCATION IN INDIA

Amita Chatterjee*

It appears that the digital turn in India has come to stay. It is time that we familiarize ourselves with the new technologies and use it as "an omnibus support" in our teaching-learning environment to the benefit of all. Information Communication Technology (ICT) has been harnessed to promote quality education in the developed world. The Indian system of education can also go forward by deploying ICT on a mass scale.

According to UNESCO, ICT is a scientific, technological, and engineering discipline and management technique used in handling information, its application and association with social, economic and cultural matters. A Google search results in another oft-used description of ICT as all devices, tools, content, resources, forums and services, digital and those that can be connected into or delivered through digital forms, which can be deployed for realizing the goal of teaching-learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system.

By combining information technology with communication technology we get various ICT tools, which enable us to supplement successfully and effectively the older talk-and-chalk teaching-learning method. In an ICT-enabled environment, therefore, older technologies of telecommunication are combined with newer information technologies. It involves the use of radio, television, computers, cell phones, digital cameras, scanners, sound recorders, interactive boards, and other audio-video equipment, Internet and wireless networks, e-mails, various different search engines for web-browsing and net-surfing.

From the beginning of the 21st century, the Indian Government started emphasizing the use of ICT in school education and the National Policy of ICT in School Education was finalized in 2012. The vision statement of the said policy mentions that, "It aims at preparing youth to participate creatively in the establishment, sustenance, and growth of a knowledge society leading to all round socio-economic development of the nation and global competitiveness."[1] Accordingly, ICT has already been introduced at the school level with the objective to create an ICT-literate community that can deploy,

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utilize, and benefit from ICT and successfully contribute to nation building. The introduction of ICT requires a digital infrastructure, which is expensive. The ideal infrastructure entails:

- Each trainee has a laptop or tablet with an inbuilt effective software.
- Libraries are digitized.
- Sufficient number of e-readers, which can hold hundreds of books in digital forms are available for trainees.
- Digital contents be customized in local languages.

POTENTIAL OF ICT IN HIGHER EDUCATION

Assuming the government has already provided the basic infrastructure for the use of all stake-holders all over the country, and both trainees and trainers have become at least ICT literate, we propose that ICT be used in higher education to promote the threefold aim of increasing access, upholding equity, and enhancing quality as enshrined in our recent education policies. It has already been proved that ICT has tremendous potential for enhancing outreach and improving efficiency and quality of education. The use of ICT is expected to meet various challenges encountered by the current system of education, such as, how to:

- make educated undergraduates employable;
- adapt, adopt, translate, and distribute sparse educational resources across different media and forms to promote their accessibility and extensive use by all;
- digitize and disseminate existing print resources;
- contribute to teacher-capacity building;
- promote creative, aesthetic, analytical, and problem-solving abilities of teachers and students; and most significantly,
- introduce new curricula and new pedagogy in higher education, appropriate for accomplishing these ends.

The above-mentioned policy document suggests that ICT literacy may be organized in three levels.

Basic level: Trainees to be acquainted with the basics of computers and search engines to the extent: familiarize themselves with Word and data-processing tasks, use and troubleshoot storage, input and output devices, connect to the Internet, use email, and different social media.

Intermediate level: Teachers and trainees learn to create and manage content, tools, and resources and to learn software applications.

Advanced level: Trainees learn to use different software applications to enhance self-learning, create and participate in web-based networks for co-operative and collaborative learning, and know issues of cyber-security, copyright, and plagiarism, among others.

The time needed to successfully complete each stage depends on the local situation and availability of the digital environment, digital tools and technology, and willingness of students, teachers, and education administrators to participate in the process.

PEDAGOGICAL AND CURRICULAR REFORM

ICT supports, and in turn is supported by, pedagogical and curricular reform. In the traditional teaching-learning environment teachers were the source of knowledge and learners were passive recipients. This kind of unidirectional oral transmission of information was considered the best means of imparting knowledge. But majority of students failed to realize their potential in this climate of rote learning and became demotivated degree-earners. ICT, on the other hand, creates a learner-centric teaching-learning environment. Students are encouraged to 'construct' meaning or new knowledge based on their prior knowledge and experience and develop into active learners. They get knowingly and enthusiastically involved in attaining certain information. They are aware of what information they need, why they need it, how they will have access to that information, and how much of that information they can understand and internalize. Researches in cognitive neuroscience show that active learning generates deeper grasp of subjects, lowers the rate of forgetting, and increases the possibility of transfer of knowledge to new problem situations. Active learning leads to independent learning. Students no longer need to be spoon-fed by teachers; they can access whatever information they need for their assigned projects through the Internet and thus become less dependent on their teachers. They learn to manage projects on their own and they become self-motivated, responsible knowledge-seekers who are likely to maximally utilize resources available to them. They learn to adapt themselves to changed knowledge situations and are able to respond to new information by using different digital platforms, such as blogs, tweets, chatrooms, etc. They do not have to wait for the publication of revised texts since with the advancement of digital technologies, printed resources have started yielding to on-line resources.

DYNAMIC AND COLLABORATIVE LEARNING

Another consequence of using ICT is the promotion of dynamic and collaborative learning. With anytime, anywhere access to the Internet, geographical location does not stand in the way of acquiring information. Students can access different informative web-sites outside school hours, sitting at home, in a library, or a cyber cafe. Cognitive neuroscientists maintain that the brain is a very individualized organ. Different brains learn differently. ICT allows students to learn at their own pace and therefore helps develop diverse talents and potentials. With the Internet facility the rural-urban divide can also be bridged. Students from remote rural communities can have access to the same set of information as their urban counterparts through the Internet. Learning with ICT does not make anyone a lone enquirer because it not only facilitates human-machine interaction but also human-human interaction. Students can interact with their peers and teachers through different web platforms. Usually, institutions encouraging e-learning provide LAN or intranet and WAN or extranet facilities, whenever they need some clarification or feedback, thus making the learning process a collaborative enterprise. Being thus interactively engaged students can be more analytical and creative and enjoy the learning experience that much more.

With the use of ICT students or learners become conscious of the learning process. With a little self-observation they understand how they learn best. In other words, ICT-based learning contributes to self-appraisal and self-understanding which again boosts self-confidence by increasing awareness of the level of competence and proficiency. As they becomes more competent and proficient, the students can transfer whatever they have learnt in the classroom to real-life problem situations, choose and successfully apply appropriate strategies in unknown contexts.

THE ROAD BLOCKS

In spite of all the advantages, many have not welcomed the introduction of ICT. In several cases, teachers are extremely reticent, mainly because of the following reasons:

- Teachers of older generation do not have sufficient exposure to new technologies, nor do they receive immediate technical support when they get stuck in the classroom.
- Many teachers are afraid that ICT will undermine their role in the classroom and are afraid of becoming superfluous and eventually, losing their jobs.

- Managements are least enthusiastic because of heavy initial expenditure involved and also because easy Internet access appears to provide students with opportunities to plagiarize and download pornographic materials.

All these apprehensions and misperceptions, however, can be removed. Teachers can be properly trained for handling new technologies and hands-on technical support can be provided in classrooms. While it is difficult to remove the negative perception of ICT, teachers need to be convinced that ICT can never replace a teacher; but the role of teacher will change in the new environment. Undoubtedly, teachers are no longer the only source of knowledge in the new circumstances, but they need to multi-task and become valuable facilitators, supervisors, and instruction providers in the learning process.

Managements have to make all concerned aware of the principles of Internet ethics and thus reduce the possibility of its misuse. They can block access to pornographic sites from the institutional LAN by using filters and site-blockers.

FLIPPED CLASSROOM TEACHING-LEARNING

The constructive theory of learning that fits well with ICT is the flipped classroom method of teaching-learning. This is a blended learning method where students come prepared with lessons through e-learning resources and during class time they participate in discussions and interaction with teachers and peers. Face-to-face teaching time is not used for listening to lectures or to exchange information. Teachers guide the students to engage in open-ended discussions for deeper understanding of subjects and for honing their intellect.

The advantages of flipped classroom:.

1. With on-line resources students can revisit information whenever they want if they feel the need to review some salient concepts.
2. Class time can be better utilized by holding debates and answering questions on specific topics. Teachers can suggest areas for further study when the trainees have mastered what they are supposed to have learnt.
3. Teachers have more time and opportunity to give valuable feedback to the students.
4. Lessons can be made more personalized in accordance with the level and ability of a learner. The content of learning can be personalized for the benefit of the individual trainees in a digital environment.

MASSIVE OPEN ONLINE COURSES (MOOCs)

In a vast country like India, building brick-and-mortar educational institutions in remote areas with facilities comparable to well-known older institutions of higher learning, is very difficult. Here also ICT can play a very significant role in expanding global learning networks. For the democratic expansion of education another useful contribution of ICT is in the area of launching and supporting MOOCs. These courses are in vogue in Europe, USA, Canada, and in developed Asian countries, in spite of controversies surrounding them. Surprisingly 27 per cent of the total enrollment till 2017 in American MOOCs, such as Coursera, are from India. That shows the growing demand for online courses among Indian learners. Top institutes, such as the Indian institutes of technology, management, and science — IITs, IIMs, IISc — have launched MOOCs. What exactly is a MOOC?

One definition of MOOCs is:

> MOOCs are courses designed for large number of participants, that can be accessed by anyone anywhere as long as they have an internet connection, are open to every-one without entry qualifications, and offer a full/complete course experience online for free.[2]

The acronym needs to be explained further. Open Online Courses are qualified as 'massive' because these are for a large number of participants. Usually the number of participants is much larger than that can be taught in a normal campus classroom. The limit of a campus classroom is usually defined by Dunbar's Number. Stephen Downes (2013), sets 150 as the Dunbar's Number, the limit to the number of people with whom one can maintain stable social relationship. In a massive course, however, the number of participants may easily exceed 150, although there is bound to be some technical resource constraint. It is claimed that the pedagogical model of a massive courseware is such that the costs of services and efforts involved do not increase significantly in proportion with the increase in the number of participants.

'Open' implies the freedom from constraints of space, time, and pace. Although, as of now, most MOOCs have a fixed starting and ending dates, these are not the necessary features of a MOOC. If a course is to be taken as a partial requirement of acquiring a degree, then start and end date have to be specified. Consequent upon that, the pace also becomes somewhat pre-determined. Completely self-paced courses constitute only 6 per cent of all MOOCs offered so far. Sometimes, some MOOC providers set an age-limit and the cut-off line is 16 or 18 years. Participants from some sanctioned countries are found to be blocked out. The levels of MOOC courses may

vary. All courses are not meant for beginners. Therefore, any advanced course should be preceded by an introductory course in the same area.

Such courses are called 'online' because the digital content is devised, delivered, and assessed through the Internet. The educational content may comprise videos, audios, texts, games including simulations, animations, and social media. Online interaction can take place through various social media channels, blogs, and forums. Feedback can be received online from peers and teachers through chatrooms. Assessment may be done, if required, through quizzes. Sometimes, online courses may be supplemented by some offline face-to-face activities. But these are optional and additional and may not be free of cost. Usually, a certificate of completion is given to takers of a MOOC.. But in most cases although the courseware is open and free, one needs to make some payment for a formal certification.

On an average the total study time of a MOOC is between 1 and 4 ECTs, where one ECT (expected completion time) is 25-30 study hours.

There are several MOOC platforms in India launched and prepared by academic institutions and the Government besides popular MOOC providers such as edX, Coursera, Udacity, and Khan Academy. Initially, these platforms concentrated on creating and providing e-resources and consolidating network connectivity. The Government of India started some programmes to offer online courses and also supported such initiatives of a few academic institutes and universities. National Programme on Technology Enhanced Learning (NPTEL) is one such joint initiative of seven IITS and IISc funded by Ministry of Human Resource Development (MHRD) for offering courses on engineering and science. NPTEL has offered online courses on computer science, electrical, mechanical, and marine engineering and some courses on management, humanities, and music. Using open source technology, it offers course contents mainly in video format along with text meta data for possible conversions to all Indian languages. Although in the beginning these courses were not sufficiently interactive, the quality and interactivity of the courses have improved with time. NPTEL is planning to operate as a MOOC provider by introducing assessment and tests.

mooKIT: In 2014, Indian Institute of Technology Kanpur introduced mooKIT, a MOOC management system, to offer 15 courses with about 100,000 registered learners. This system has been especially designed to tackle the problems arising from low-bandwidth and low-computing power. The system can warn in case of bad connections and provide alternative resources in audio format together with slides in place of video resources. If the bandwidth is low

even for audio texts, a learner can use just a basic phone for audio lessons and learn. This is very convenient for rural learners who do not have good Internet connectivity or high bandwidth. MooKIT also uses open source technology and its core engine runs on JavaScript based technology. Depending on the requirement of the learner mooKIT offers four solutions:

1. mooKIT Standard helps run a single course. It does not contain inbuilt videos but YouTube videos can be accessed.
2. mooKIT Enterprise can be used to run a number of courses.
3. mooKIT Replicated is specially designed for low bandwidth areas. It allows content to be cached in local servers with update facilities.
4. mooKIT Personal or Mobi-mooKIT can run on devices with low computation and low storage capacity, say, on mobile devices. Due to device constraint , however, it cannot provide social networking facility.

IITBombayX: IIT Bombay developed this non-profit MOOC system around the same time, using the open source platform Open edX. This system offers blended learning MOOCs and by using this platform some Indian universities are running open online courses for local college students. That is why course completion is compulsory for those who opt for these MOOCs.

SWAYAM — Study Webs of Active-Learning for Young Aspiring Minds: Our list of MOOC platforms developed and used in India will remain incomplete if we do not mention SWAYAM, a platform launched in 2016 by MHRD. For running SWAYAM courses an independent platform was developed in collaboration with Microsoft. It was launched with the objective of combining on-line and off-line education. It's declared goal is to develop, launch, and run 2000 open on-line courses. These are all meant as credit courses and SWAYAM courses allow the transfer of credits between institutions. It has been decided by UGC that an academic institute in India would be allowed to offer up to 20 per cent of its syllabus adopted for a particular programme via SWAYAM.

The courses hosted on SWAYAM platform are offered by following nine National Coordinators:

1. AICTE (All India Council for Technical Education) for self-paced international courses
2. NPTEL (National Programme on Technology Enhanced Learning) for Engineering
3. UGC (University Grants Commission) for non-technical postgraduate education

4. CEC (Consortium for Educational Communication) for undergraduate education
5. NCERT (National Council of Educational Research and Training) for school education
6. NIOS (National Institute of Open Schooling) for school education
7. IGNOU (Indira Gandhi National Open University) for out-of-school students
8. IIMB (Indian Institute of Management, Bangalore) for management studies
9. NITTR (National Institute of Technical Teachers Training and Research) for Teacher Training programme.

Stumbling Blocks

The major stumbling blocks in implementing MOOCs for higher education in India are: "The lack of technological infrastructure, investment, diversified population, quality of courses, adoption of MOOC among learners, and their acceptance by the academic institutions." (Jyoti Chauhan 2017). The Government of India has taken special initiatives to provide the necessary technological backbone for launching MOOCs nationally. GOI may even invite public-private-partnership projects for creating the necessary infrastructure. Although connectivity and bandwidth are not yet satisfactory everywhere, especially in remote and rural areas, we hope that the situation will improve in the near future. We have that IIT Kanpur has developed a MOOC platform like mooKIT to especially address this issue. The Government is also partnering in creating content with specialized academic institutions and universities. Teachers and instructors are being especially trained to use MOOC platforms extensively.

To hasten the progress in implementation of MOOCs the Government has entered into a deal of Rupees 38 crores with Microsoft for launching and maintaining SWAYAM. All institutions contributing to SWAYAM have received additional funds from the Indian Government for developing specialized contents.

To minimize the problems arising out of lack of language proficiency the SWAYAM platform allows both English and Hindi. We expect that the platform will be available in other Indian languages as well.

Concerns

Two major concerns that have often been voiced against the effectiveness of MOOCS:

1. Although by using MOOCs it is possible to efficiently disseminate information with extensive outreach, mere access to information does not amount to knowledge. Learners learn a lot by interacting directly with teachers. Students often emulate their teachers and such interactions contribute positively to character-building.
2. Because dissemination of information takes place mainly through written communication in MOOCs, there is a dip in the oral communication skill of the learners. In the absence of company many a times learners feel demotivated and drop out of the courses.

To counteract these concerns SWAYAM encourages blended learning. Taking on-line courses does not prohibit face-to-face interaction. After digitally accessing on-line courses, learners can attend their college or institution. MOOCs have been most successful as supplemental courses. This answers both the concerns.

The quality of SWAYAM courses is monitored by experts and adopting MOOCs at least ensures that academic modules of the same quality will be available all over the country. Differential development of learners can be attempted on top of this basic foundation without ignoring the ethnicity and gender of the learners. MOOCs do not take away the right of the teachers to restructure or design courses in accordance with the need of the learners. Unfortunately, in India, more than 90 per cent of those who sign up for MOOC courses do not complete the courses and that makes people skeptical about the efficacy of MOOCs.

There are a few more hitches to be sorted out. The assessment mode for these courses has not yet been standardized and MOOCs need to be supplemented by laboratory experiments and hands-on training. It is true that MOOCs have been a great help to professionals and students from engineering and technology background to upgrade their existing knowledge-base. But in the global scenario, MOOC platforms have been scaled down because it has become difficult to sustain them. Because of a decline in enthusiasm about MOOCs, enrollment has gone down. Now MOOCs 2.0 is in vogue offering a mix of free and paid courses, which is known as the freemium model. Of course, the Government of India is still projecting and supporting MOOCs as free courses, since they are the most potent means of democratizing higher education and bridging the gaps across many divides that plague a vast country like India. But, as Apoorvanand asks, will this not divide the world again into two neat categories, the learner and knowledge providers? Will every learner be able to cherry-pick courses according to her or his choice? He writes, “the

final question on my mind is: would those who can afford to go to the top-end universities stop going there in favor of the virtual learning space called MOOCs? We know the answer." (2018, p.200).

CONCLUSION

Whenever something new is proposed, people find it difficult to accept. That is human nature. We are more for maintaining status quo. So it is not surprising that so many questions are being raised regarding MOOCs. Undoubtedly, ICT and virtual-learning space will not solve all problems — epistemological, moral and economic. But we must endeavour derive the best for Indian Higher Education by the judicious application of ICT, sticking to our end of providing quality education for all. At the same time, we need to keep our minds open for retracing our steps if we meet with insurmountable obstacles. Let us give ICT a fair trial as a means to reach the benchmark in higher education, remembering William Cobbett's popular adage, "You never know what you can do till you try."

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ENDNOTES

1 https://www.mhrd.gov.in. 23 March 2012; downloaded on 20.08. 2019.

2 Home and OpenupEd Document, March 2015.

Table 1: R&D attributes of select countries excelling in scientific innovations

Rank in Global Innovation Index (2019)[a]	*Country*	*Rank in Research Publications*[b] *(2018)*	*Rank in H-Index*[a] *(2019)*	*Rank in IPR*[c] *(2018)*	*Rank in University-Industry Collaborations in R&D*[a]	*R&D Exp. (PPP Billion USD)*[d]	*R&D as % of GDP*[d] *(2017)*	*% Contribution by Private Sector*[d]
1	Switzerland	18	9	3	3	14.7	2.98	71.5
2	Sweden	20	11	9	9	14.2	3.31	67
3	USA	1	1	2	1	476.5	2.83	71.5
4	Netherlands	15	8	5	4	16.4	2.10	56
5	UK	3	1	7	7	43.8	1.73	65.1
6	Finland	37	19	1	5	7.2	3.50	67.7
8	Singapore	34	23	16	10	10.1	2.62	61.2
9	Germany	4	3	10	6	109.6	2.84	67.7
10	Israel	33	16	20	2	11.8	4.05	84.6
11	S. Korea	13	18	29	26	73.1	4.30	78.2
12	Ireland	42	28	18	11	3.6	1.75	NA
14	China	2	13	50	27	370.6	1.96	77.3

Rank in Global Innovation Index (2019)[a]	*Country*	*Rank in Research Publications[b] (2018)*	*Rank in H-Index[a] (2019)*	*Rank in IPR[c] (2018)*	*Rank in University-Industry Collaborations in R&D[a]*	*R&D Exp. (PPP Billion USD)[d]*	*R&D as % of GDP[d] (2017)*	*% Contribution by Private Sector[d]*
15	Japan	6	6	6	18	169.6	3.50	77.8
52	**India**	**5**	**21**	**52**	**23**	**48.1**	**0.84**	**35.5**

Source: a: Global Innovation Index Report 2019

b: https://www.scimagojr.com/countryrank.php

c: https://www.internationalpropertyrightsindex.org/countries

d: http://uis.unesco.org/apps/visualisations/research-and-development-spending

GDP: Gross Domestic Product

GERD: Gross Expenditure in Research and Development

PPP: Purchasing Power Parity

USD: United States Dollar

FTP/mnpopn: Full Time Equivalent per million population (inhabitants)

IPR-Intellectual Property Right

Figure 1. Aspirations of academia and industry from each other.

Table 2: Major public private partnership programmes in R&D initiated by various agencies/organizations

S. No.	Department/Agencies	Programmes/Schemes/Initiatives
Government		
1.	Department of Science and Technology (DST; www.dst.gov.in)	➢ India Innovation Growth Programme 2.0 ➢ Technology Development Programme (TDP) ➢ Science and Technology International Cooperation Division Programmes ➢ Drugs and Pharmaceutical Research Programme
	a) Science and Engineering Research Board (SERB; www.serb.giv.in)	➢ Prime Minister's Fellowship for Doctoral Research
	b) National Science and Technology Entrepreneurship Development Board (NSTEDB; www.nstedb.com)	➢ National Initiative for Developing and Harnessing Innovations (NIDHI)

S. No.	Department/Agencies	Programmes/Schemes/Initiatives
2.	Technology Development Board (TDB; www.tdb.gov.in)	➢ Financial Assistance Programme (TDB) ➢ Seed Support Scheme and Venture Capital Fund
3.	Global Innovation and Technology Alliance (GITA; www.gita.org.in)	➢ Bilateral Programmes ➢ Multilateral Programmes ➢ Technology Acquisition Fund Programme (TAFP) ➢ Technology Acquisition and Development Fund (TADF)
4.	Technology Information, Forecasting and Assessment Council (TIFAC; www.tifac.org.in)	➢ Advanced Composites Programme ➢ Revolving Technology Innovation Fund ➢ MSME-Technical Upgradation
5.	Department of Scientific and Industrial Research (DSIR; www.dsir.gov.in)	➢ Patent Acquisition and Collaborative Research and Technology Development (PACE) ➢ Promoting Innovations in Individuals, Start-ups and MSMEs (PRISM) ➢ Consultancy Promotion Programme (CPP)
	a) Council of Scientific and Industrial Research (CSIR; www.scirhrdg.res.in)	➢ New Millennium Indian Technology Leadership Initiative (NMITLI)
	b) National Research Development Cooperation (NRDC; www.nrdcindia.com)	➢ Knowledge Management System for Technology Promotion
6.	Department of Biotechnology (DBT www.dbtindia.gov.in);	➢ Scientific Infrastructure Access for Harnessing Academia University Research Joint Collaboration (SAHAJ) ➢ Biotech Science Clusters
7.	Biotechnology Industry Research Assistance Council (BIRAC; www.birac.nic.in)	➢ Small Business Innovation Research Initiative (SBIRI) ➢ Biotechnology Industry Partnership Programme (BIPP) ➢ Promoting Academic Research Conversion to Enterprise (PACE) ➢ National Bio-pharma Mission ➢ Industry Innovation Programme on Medical Electronics (IIPME) ➢ Bio-incubators Nurturing Entrepreneurship for Scaling Technologies (BioNest) ➢ Biotechnology Ignition Grant (BIG) ➢ Sustainable Entrepreneurship and Enterprise Development (SEED) Fund

S. No.	Department/Agencies	Programmes/Schemes/Initiatives
8.	Ministry of Electronics and Information Technology (MeitY; www.meity.gov.in)	➢ Multiplier Grant Scheme (MGS) ➢ Modified Special Incentive Package Scheme(M-SIPS)
9.	Ministry of Micro, Small and Medium Enterprises (M/o MSME; www.msme.gov.in)	➢ A Scheme for promoting Innovation, Rural Industry and Entrepreneurship (ASPIRE) ➢ Credit Linked Capital Subsidy for Technology Up-gradation (CLCSS) ➢ Science and Technology Scheme (STS)
10.	Indian Council of Agricultural Research (ICAR; www.icar.org.in)	➢ National Agriculture Innovation Fund ➢ National Agriculture Science Fund ➢ Agrinnovate India Ltd. ➢ Venture Capital Assistance Scheme
11.	Department of Pharmaceuticals (www.pharmaceuticals.gov.in)	➢ Cluster Development Programme for Pharma Sector (CDP-PS)
12.	Department of Industrial Policy and Promotion (DIPP; www.dipp.nic.in)	➢ Invest India ➢ Make in India ➢ Start-up India
13.	Defence Research and Development Organization (DRDO; www.drdo.gov.in)	➢ The DRDO-FICCI Accelerated Technology Assessment and Commercialization (ATAC) Programme ➢ Directorate of Industry Interface and Technology Management (DI2TM) ➢ Innovations for Defence Excellence [iDEX; under Defence Innovation Organization (DIO)]
14.	Principal Scientific Advisor to the Government of India (PSA; www.psa.gov.in)	➢ Accelerating Growth of New India's Innovations (AGNIi) ➢ India Science, Technology and Innovation Portal (ISTI)
15.	Indian Space Research Organization (ISRO; www.isro.gov.in)	➢ Sponsored Research (RESPOND) ➢ ISRO Technology Transfer Group
16.	Ministry of Heavy Industries and Public Enterprises www.dhi.nic.in	➢ Public-Private Partnership (PPP) for Fast Development of New Technology/Systems ➢ Core Group on Automotive Research (CAR)
17.	Ministry of Textiles (MoT; www.texmin.nic.in)	➢ Technology Upgradation Fund Scheme ➢ Textile Research Associations

S. No.	Department/Agencies	Programmes/Schemes/Initiatives
18.	Ministry of Drinking Water and Sanitation (www.mdws.gov.in)	➢ Swachh Bharat Mission
Education Sector		
19.	Ministry of Human Resource Development (MHRD; www.mhrd.gov.in)	➢ Institutes Innovation Council (IIC) ➢ Council for Industry Higher Education Cooperation (CIHEC) ➢ Research Parks ➢ Technical Education Quality Improvement Programme (TEQIP) ➢ Impacting Research Innovation and Technology (IMPRINT) India Initiative
	a) University Grants Commission (UGC; www.ugc.ac.in)	➢ University-Industry Inter Linkage (UIL) Centres
	b) All India Council for Technical Education (AICTE; www.aicte-india.org)	➢ Industry Institute Partnership Cell (IIPC) ➢ Innovation Promotion Scheme (IPS) ➢ AICTE-CII Survey of Industry-Linked Technical Institutes 2016
Private Sector		
20.	Federation of Indian Chambers of Commerce and Industry (FICCI; www.ficci.in)	➢ DRDO-FICCI initiative for Accelerated Technology Assessment and Commercialization (ATAC) ➢ National Knowledge Functional Hub ➢ DST-Lockheed Martin-TATA Trusts India Innovation Growth Programme (IIGP) ➢ ASEAN-India Innovation Platform
21.	Confederation of Indian Industry (CII; www.cii.in)	➢ AICTE-CII Survey of Industry-Linked Technical Institutes ➢ CII-BESU Innovation Centre ➢ Global Innovation and Technology Alliance (GITA) ➢ Prime Minister Fellowship Scheme for Doctorate Research
22.	National Associations of Software and Services Companies (NASSCOM; www.nasscom.in)	➢ Centre of Excellence for Internet of Things (IoT) and Artificial Intelligence (AI) ➢ India Innovation Fund

S. No.	Department/Agencies	Programmes/Schemes/Initiatives
Banking Sector		
23.	National Bank for Agriculture and Rural Development (NABARD; www.nabard.org)	➢ Credit Linked Capital Subsidy Scheme ➢ Corpus fund of ₹50 crores for R&D
24.	Syndicate Bank (www.syndicatebank.in)	➢ Syndicate Bank Entrepreneurship Research and Training Centre at IIT-Kanpur (SBERTC-IITK).
25.	Small Industries Development Bank of India (SIDBI; www.sidbi.in/en)	➢ SIDBI Innovation and Incubation Centre (SIIC) at IIT Kanpur ➢ TIFAC-SIDBI Revolving Fund for Technology (SRIJAN Scheme)
26.	Industrial Credit and Investment Corporation of India (ICICI; www.icicibank.com)	➢ Creation of Sponsored Research and Development Board (SPREAD) ➢ ICICI Bank's Technology Finance Group (TFG) ➢ ICICI Foundation for Inclusive Growth
27.	a) Industrial Development Bank of India (IDBI; www.idbibank.com) b) Industrial Finance Corporation of India (IFCI; www.ifciltd.com) c) State Bank of India (SBI; www.onlinesbi.com) d) ICICI (ICICI; www.icicibank.com)	➢ Creation of Entrepreneurship Development Institute of India with the financial support from conglomerate of banks

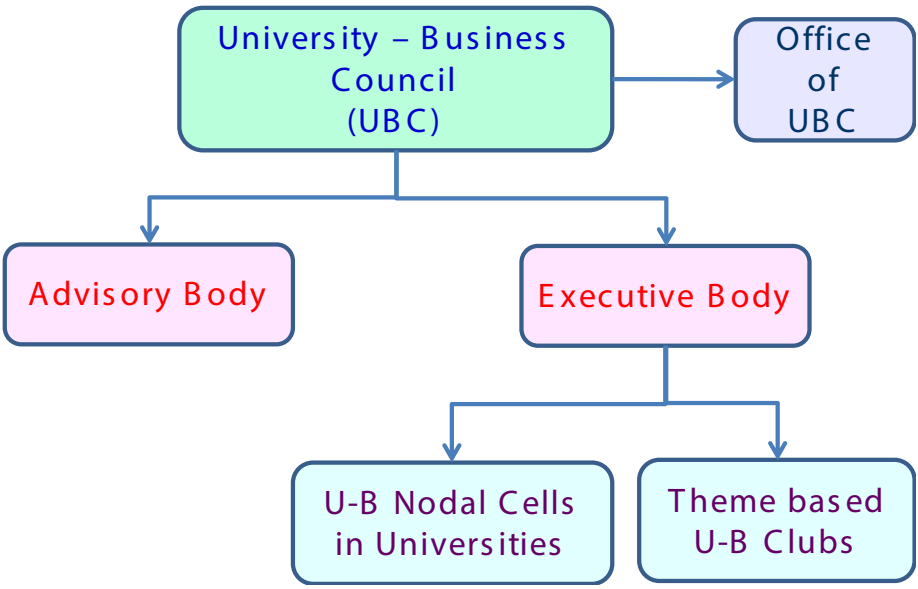

Figure 2. University-Business Council framework.

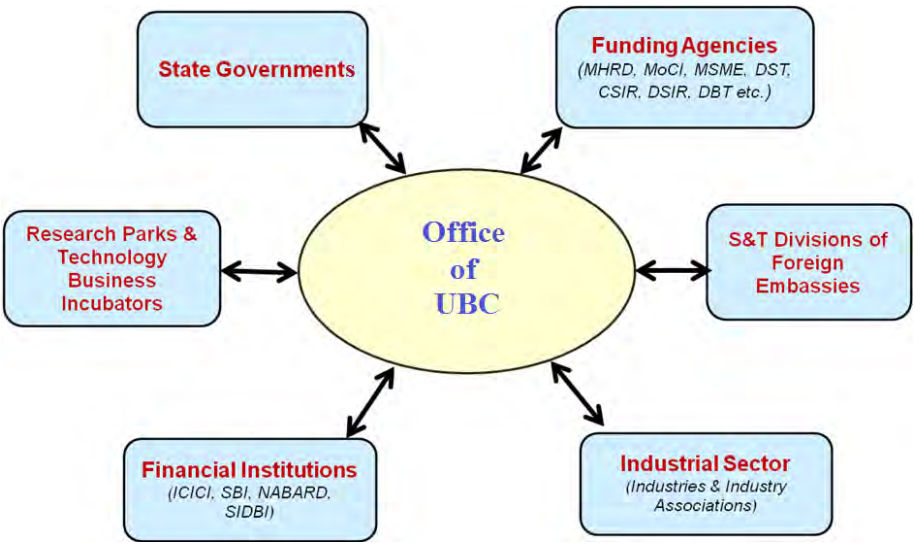

Figure 3. Networking of the University-Business Council with different bodies, agencies, organizations.

Table 3: BIRAC schemes for various stages for innovations

Stage	Schemes	
Incubation	BioNEST/UIC	***Idea***
Ideation to early stage	BIG/SITARE/eYUVA	↓
Ideation to late stage	SBIRI/BIPP	↓
PoC to late stage	ETA	↓
Translation research	PACE (AIR/CRS)	↓
Equity	SEED Fund/AcE Fund/LEAP Fund/ Product Commercialization Fund	***Innovation***

Abbreviations:

BioNEST — Bioincubators Nurturing Entrepreneurship and Scaling Technologies
UIC — University Innovation Clusters
BIG — Biotechnology Ignition Grant
SITARE — Students Innovations for Advancement of Research Explorations
eYUVA — Encouraging Youth for Undertaking Innovative Research Through Vibrant Acceleration
SBIRI — Small Business Innovation Research Initiative
BIPP — Biotechnology Industry Partnership Programmed;
ETA — Early Translation Accelerators
PACE — Promoting Academic Research to Enterprise
AIR — Academic Innovation Research
CRS — Contract Research Scheme
AcE — Accelerating Entrepreneurs Fund
SEED Fund — Sustainable Entrepreneurship and Enterprise Development Fund
LEAP Fund — Launching Entrepreneurial Driven Affordable Products Fund
PoC — Proof of Concept

Table 4: Engagement of industry with academia for R&D project

Stage	Industry Involvement	Financial Contribution by Industry
I	Desirable	Optional
II	Desirable	Desirable
III	Yes	Yes (partial/complete)
IV	Yes	Yes (partial/complete)

Figure 4: Home page of Industry-Academia CRIKC web portal.

UNIVERSITY-SOCIETY CONNECT

Darshan Shankar*

INTRODUCTION

The university-society connect is recognized by policy makers and educationists as an essential feature of the educational process. However, in the absence of a sharp analysis of the strategy on "how to connect", the approaches adopted in Indian universities have been fragmented. The feature needs to be built into the teaching and research processes instead of being positioned as one that needs to be appended outside of the basic educational processes.

For the last 180 years or so, since the British established the first higher education institution (HEI) in India, the intellectual content of university education has been culturally alienated from the Indian society's roots. Because of this background the university-society connect has remained weak. Furthermore the disproportionate emphasis on the western pedagogy of abstract learning in classrooms and laboratories, adopted by the Indian university system prevents students and faculty from getting a first-hand exposure to social reality. Experiential learning is therefore an urgent requirement. An unconventional analysis of the strategies to achieve the university-society connect are discussed here.

DEEPENING UNIVERSITY-SOCIETY CONNECT:

Synergizing the Three Basic Functions

In conventional perception of universities, 'teaching' is seen to be the central function (Draft National Education Policy 2019, [DNEP] p. 205). Undoubtedly, teaching is a primary function of a university because dissemination of knowledge is an essential social function of university systems. Teaching sows the seeds of knowledge in students for them to become carriers of that knowledge to transform themselves and society. Majority of colleges and universities in India are focused on the teaching function. But universities that are focused exclusively on the teaching function, are unlikely to have the capacity to sufficiently impart contemporary knowledge because they can only teach what is discovered by others (*ibid.*).

Critical educationists have observed that excellent teaching institution evolve when they are organically linked to high-quality research (*ibid.*) and socially impactful outreach programmes. In such institutions, students benefit much more because the teaching function focuses on problem solving and is constantly

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refreshed by insights from research and outreach endeavours. Students from such universities are likely to become future innovators (Chandra, 2017, ch. 6), who develop capacity to build upon the known to solve new problems arising from constant changes that occur in nature and society.

The importance of research is not sufficiently recognized in university systems. This is borne out by the fact that there are few universities and colleges, which have a track record of excellent research and the country has very few research-oriented universities (DNEP, *op. cit.*). This scenario of poor or negligible research in universities suggests that in educational practice research is viewed as an optional function by higher education institutions in India.

The outreach function is the most neglected in Indian university education. This function is about the creative societal application of knowledge as generated by the university or as made available to faculty and students. The purpose of the outreach function is to demonstrate scalable proof of concept solutions, to societal problems. Today the outreach, which is the cutting edge of the "university-society connect function" is believed to be peripheral and even expendable. Possibly because of the fragmented way in which the university-society function was visualized in the 1960s, the Kothari Commission Report (1964–66) explains how the society connect has been viewed in a peripheral manner.

To deepen the university-society connect there is a need to develop synergistic relationships between the three functions of teaching, research, and outreach. This becomes clear when we review the basic purpose and goals of a university.

BASIC SOCIETAL PURPOSE OF UNIVERSITY SYSTEMS

The basic purpose of university systems can be derived from the first principle by asking, what is a university and therefore what is its role. In the broadest vision, a university is a place to enable study and learning about multiple facets of existence, that is the entire universe, our own planet, its inanimate and living forms, its ecosystems, diverse human cultures, the interconnectedness among all these facets of existence and equally important their connect with the learner.[1] The university-society connect is perhaps an intrinsic part of this basic purpose.

It is pertinent, therefore, to ask if students can learn about the complexities of nature and society within the limited precincts of a university? Can reading books in the library, teachers lecturing in the classrooms, experiments conducted in the laboratories, the information culled on the web, teach, with sufficient

insights, the huge diversity that exists and the recurrent changes? When we examine the limitations of the ivory tower strategy to fulfil the purpose of education, the role of the outreach and research function becomes clear (Mathai, 1985). This impels both teachers and students to interact directly with nature and society. While books, classrooms, and laboratories do indeed provide an indirect introduction to nature and offer distilled insights from specific perspectives, they cannot substitute the direct interaction of the learner with social and natural reality. The functions of research, outreach, and teaching are interconnected and ideally need to seamlessly integrate with a multidisciplinary framework (DNEP *op. cit.*, ch. 9; Chandra *op. cit.*, ch. 5). When they are separated, they dilute the quality of the education process. Universities with exclusive focus on teaching, inevitably impart incomplete education, devoid of a holistic world-view.

Research-oriented universities reveal that initially, they admit only doctoral and masters students because such students can work alongside faculty and can actively participate in research. During the first 70 years of its existence, the Indian Institute of Science (IISc), Bangalore, for example, was mainly a research university and largely admitted doctoral students. The very best research universities constantly take initiative to design and develop translational or outreach programmes to apply research for solving real problems. After such universities have built stable knowledge-generation processes, they gradually move into the second phase where they participate more actively in the teaching function by admitting undergraduate, diploma, certificate, and vocational skill students, in order to share their first-hand insights on nature and society at different levels of learning. In research universities, integration of research and outreach into active teaching programmes takes place in this second phase. Universities attain the level of excellence when they achieve synergy between the research, outreach, and teaching functions. Such synergy however, cannot be achieved overnight. It happens over a few decades, starting with research and outreach and then integrating the results and insights with the teaching function.

The disconnect between teaching, research, and outreach is the first cause of the university-society alienation in the Indian University system.

CULTURAL ALIENATION OF THE INDIAN UNIVERSITY EDUCATION

Knowledge is a cultural product (Iaccarino, 2003). Intellectual traditions in different cultures categorize the study of the universe, our planet, life, society, and

self into various subjects. In Indian society one of the schemes in its mainstream cultural and intellectual traditions, classified subjects as *darshana*s, *kala*s and *vidya*s (*Bharatvani*, 1999) to understand the universe and our planet. There are, however, variations in the classification schemes and subjects of study in various indigenous subcultures in the country. In fact, it is evident from the history of the evolution of knowledge systems across world cultures, continents, and nationalities that schemes for the classifying the universe, life, nature, and society into subjects for study, are conditioned by perceptions of local cultures (Kumar, 2013). However in the post-colonization era in all developing countries, due to the tremendous success of colonial politics, the indigenous knowledge systems of most cultures were eclipsed (Dooh Joon-Chien, 1980) and mainstream Western classification of subjects and pedagogies for teaching and learning were adopted and assumed to be the best approaches to study natural and social reality. They were adopted universally by national elites. This holds true even today as they are visible in the modern Indian university system and in similar education systems of most countries. In 19th-century India (in the 1840s) the British Government laid the seeds of the Western scheme of higher education, by setting up the Presidency Colleges in Madras, Calcutta, and Bombay, which copied the mainstream Western scheme of knowledge categories to understand nature and society. Today two of these institutes survive, as Presidency College, Chennai and Kolkata Presidency University. The entire modern university system across India mimicked the model and pattern of the Presidency Colleges and therefore, even today, the Indian university system is almost entirely based on western cultural and intellectual traditions. Those unfamiliar with the relativity of the schemes of classification of nature, assume that the subjects and knowledge categories in the Western university system and the methods of study adopted, that is, epistemologies and the recognition of reality perceived by western ontologies are the only ways available to understand and view nature and society. Educationists barely realize that the content and model of higher education in India and most developing countries with all its strengths and limitations, is an 18th century European construct.

Beneficial knowledge from any culture in the world is a civilizational legacy and deserves respectful study, particularly in university systems. Rabindranath Tagore, the great modern seer, summed up the Indian intellectual outlook to knowledge when he advised — let winds blow in from all sides but let them not sweep us off our feet. Bright students and faculty from Indian universities, trained in Western sciences, arts and humanities, have excelled on the global

stage and this is evident from India's achievements in atomic energy, space, telecommunications, information technology, natural and social sciences. Indians have established world standards in different segments of industry, medicine, agriculture, and the arts. However, for several generations, since the 19th century, the intelligentsia has received only Western education in reputed Indian and foreign universities across various domains of knowledge. This has undoubtedly resulted in a serious cultural gap in the best Indian minds due to the limitations of the form and content of the Indian education system. Harsh critics of modern Indian university education refer to its community as "colonized minds" (Nandy, 1983). On account of the monocultural nature of Indian higher education, faculty and young students are alienated from their roots and at times, due to sheer ignorance or under the influence of the writings of insensitive or biased Indologists, harbour an unfounded suspicion that the indigenous and traditional knowledge is obsolete.

While knowledge from any cultural and intellectual source is potentially enlightening within the limitations of its world-view and methods of enquiry, it is certainly short-sighted to assume that any particular intellectual tradition, however illuminating, provides the only or the best way of knowing nature. Every culture has generated universally applicable knowledge of nature and society. The difference in knowledge generated across cultures arises due to differing world-views and the culturally unique manner in which they use the human sensory and mental faculties.

A big myth perpetuated by the colonization process, is the positioning of tradition and modernity as opposites. They lie on a continuum. This dichotomy is a mischievous colonial creation. It is a sociological and political red herring. This fallacious division between the modern and the traditional is responsible for the skewed pattern of western ethno-culture-inspired national development, in many nations, including India. The colonial fraud that was committed on our society as also on other societies in Asia, Africa, and South America was a powerful propagation of the lie that modernity had to be imported from an advanced West and that indigenous traditional knowledge systems, in spite of being functional, alive, and evolving, was not credit worthy. Therefore, Indian modernity, as is the case in other colonized countries even in the 21st century, is largely based on the transplanted modernization of European traditions.

Ironically, the modern history of Europe bears testimony to the appropriate and natural process of modernization. Its history reveals how a dogmatic

Europe in the 14th century drew core inspiration and light essentially from its own classical Greek tradition. It also learnt from other traditional cultures, for example, mathematics and surgery from India and gunpowder arms from China. European modernity has its roots in and is centrally derived primarily from its own and partly from borrowed traditions.

Modernity rooted in tradition is actually the natural sociological process of modernization. Just as the past, present and future lie on a continuum and there can be no present without a past and no future without the present, so also there can be no modernity without tradition. An intelligent and realistic definition of modernity is "Evolving Tradition".

In the Indian context, discerning scholars with some familiarity with Indian knowledge, are aware of its systemic outlook on nature and society. The Indian perspective on nature is based on the *panchmahabhuta siddhanta* and it is different from the atomic and cellular view of modern western knowledge. While it is very open-minded of the Indian intellectual leadership to learn, adapt, and assimilate knowledge from foreign cultures, it is suicidal to give up the endeavour to contemporize Indian endogenous knowledge systems (Heimstra, 2003).

India can strengthen her modernization and education processes by substantial investments in researching the contemporary relevance of our indigenous knowledge systems in various fields such fine and performing arts, healthcare, agriculture, architecture, grammar, music, mathematics, philosophy, and logic. It is a cultural absurdity that , even after over 70 years of post-independence evolution, Indian higher education remains alienated from indigenous knowledge in domains of its strength and thus from the country's rich cultural and intellectual diversity. However, in the context of education reform, the solution to future education in India does not lie in the extreme strategies of discarding Western science and technology, which have had a profound impact in shaping the modern world. The strategy should be to blend, combine, and where warranted, replace Western knowledge and paradigms, with indigenous knowledge. University education will blossom when we put multicultural processes of learning in every university. This is one of the most important and urgent challenges in higher education in the 21st century — injecting contemporary indigenous knowledge into the Indian university as the trans-disciplinary approach.

The trans-disciplinary approach is essentially broadening the mono-cultural content and deepening its scope by adopting a cross-cultural strategy for

content development in education. For example in health sciences the cross cultural domain called "Ayurveda-biology" seeded by Dr. M.S. Valiathan in 2005 is a trans-disciplinary domain. This is different from biophysics, which, while it is interdisciplinary, is not cross-cultural and trans-disciplinary like Ayurveda-biology. Similarly fusion music and dance, which are cross cultural, are examples of trans-disciplinarity. Trans-disciplinary knowledge can be developed in mathematics, architecture, agriculture, logic, linguistics, philosophy and in practically any domain except domains like information technology, which today, is inherently a mono-cultural innovation.[2]

EXPERIENTIAL PEDAGOGIES

The second and related challenge to bridge the university-society connect, is to balance the pedagogy that imparts distilled but secondary classroom and book-derived knowledge with an experiential learning scheme. Such a scheme would provide first-hand exposure of students and faculty to relevant facets of Indian society as it functions on multiple planes. Besides industry, and translational research centres, experiential spaces need to be explored in the large informal and cultural spaces, in the diverse worlds of tribal and rural communities, the worlds of farmers, artisans, crafts-persons, monasteries, artists, and across diverse natural ecosystems. The direct exposure to society and nature can help both students and faculty get a real sense of emerging challenges, societal needs, and a feel for the uniquely Indian innovation space. Critical exposure to the real world and its practicing knowledge holders can seed enquiry, discover strengths, contradictions, identify needs and give both faculty and students a feel and an idea of their own role in social transformation. The almost total absence of experiential education is the second big gap in higher education in India.

These two major gaps related to alienation from Indian cultural and intellectual traditions and the absence of experiential learning opportunities in Indian universities reflect the second major reason for the deep disconnect of the university system from society.

OVERVIEW OF PAST INITIATIVES TO BRIDGE UNIVERSITY-SOCIETY CONNECT

Since the 1970s the need for university-society connect was recognized. But a meaningful strategy to realize the connect does not appear to have been developed thus far. The National Service Scheme (NSS) was the first strategy applied in the general university system. The Kothari Commission Report

(*op. cit.*) narrates the scope of NSS. In most universities this scheme was a programme isolated from all knowledge domains coordinated by an independent university NSS coordinator. The coordinator was expected to engage students in community service by encouraging them to volunteer their manual labour (*shramdan*) for building some community asset. While the programme did create social empathy, it did not involve various knowledge domains in the university to creatively explore the application of knowledge to solve real-life problems. This initiative was therefore extremely limited in its appreciation of the scope of university-society relationship.

Two innovative initiatives were conceived in the north and west of India in the 1970s:

- The Birla Institute of Technology and Science (BITS), Pillani introduced the Practice School (PS) programme in 1973 for all disciplines and the Bombay University (BU), undergraduate (UG), and postgraduate (PG) experiential learning programme for students from multiple disciplines. Although the PS programme began in 1973 with merely 12 students and four faculty members at HINDALCO, Renukoot, it has been growing steadily since.
- The University of Bombay (BU) initiated a post-graduate experiential learning programme in 1993-1980; UGC endorsed the programme and the Union Education Ministry funded it.

Both these programmes consciously recognized the gap between the university and society and while the BITS programme emphasized exposure to industry problems, the BU programme had opportunities for much wider exposures in multiple societal settings ranging from medicine and agriculture to performing arts, and to rural or urban settings depending on the knowledge background of the students and the location of relevant exposure.

Today, as part of a developing university-society connect, especially in professional courses such as medicine, law, and engineering there are short-duration internships for students towards the end of their formal classroom education. There are also schemes in the UG programmes for socially useful work and environment education. There are a few universities, globally, that encourage "practice or action-oriented research" at the doctoral levels.

Agriculture universities are an exception. They treat extension as an independent academic discipline. But it is weakly conceived because it is disconnected from its research and general teaching function.

On the whole, the strategies for university-society connect in Indian universities are weak. Exploration of societal connects is perceived as a burden and as a non-academic activity; it is tolerated only because it is a policy mandate.

KEY STRATEGIES FOR CONNECTING UNIVERSITY EDUCATION TO SOCIETY

Four key strategies are critical to restore the university-society connect:

1. Support teaching colleges and universities to invest in research and outreach. All universities must move towards synergizing the three basic functions of the university system. The practical strategy will have to be implemented in phases. Pilots can be launched by incentivizing the best research organizations in various localities to adopt a few teaching institutions and plant relevant research in them.
2. Encourage universities academic councils to identify and induct traditional scholars for advice on the integration of subjects derived from indigenous knowledge systems in fields such as mathematics, logic, grammar, linguistics, medicine, agriculture, fine and performing arts, engineering, and biology. This is a serious exercise and has to be done with care avoiding ideological considerations and narrow chauvinism. This intervention needs a judicious and rigorous system of peer review of the learning regimen. It should start with pilots in the best institutions.
3. Assign credits in all courses for participation of faculty and students in the designing and execution of knowledge-based outreach programmes in all domains.
4. Introduce a bold policy to reserve up to 50 per cent of learning time in educational programmes across all domains for experiential learning. This strategy must involve students and faculty in problem-solving projects that focus on real life and contemporary society. Such projects can be conceived by universities in consultations with stakeholders in both applied and basic sciences covering mathematics, history, fine and performing arts, the social, natural and engineering science and architecture, law and philosophy.

CONCLUSION

University authorities have to realize that the university-society connect or the outreach function is not an additional, separate, or extraneous feature of the learning process. It has to be built into the basic functions of both teaching and research. Experiential learning, research orientation, and pilot

experiments focused on societal applications need to be woven into the learning process. Academic councils need to revisit the existing content and categories of knowledge, to objectively examine relevant contemporary aspects of Indian intellectual and cultural traditions that can be judiciously introduced into mainstream subjects in epistemologically sensitive ways. All these tasks cannot be achieved overnight. It may take up to five years in phases because the changes need expertise, sufficient deliberation, and consensus building. It is only such a holistic strategy that can develop a sustainable university-society connect in the Indian university system.

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RESEARCH AND INNOVATION IN UNIVERSITIES
Why and How These Should be Promoted

S.C. Lakhotia*

WHAT IS A UNIVERSITY?

A university is a place where scholars and teachers participate for the advancement, acquisition, and communication of knowledge in a liberal spirit and thus prepare students for their chosen professions and other aspects of life. Besides disseminating knowledge, universities also 'create' new knowledge through research and consequently, provide platforms for updated 'learning', based on existing as well as new knowledge 'created' through research. Therefore, a university faculty is expected to engage as much in research as in teaching. Any system that promotes one activity at the cost of the other (teaching versus research) weakens the university.

University and college teachers have a somewhat different role in teaching than teachers at the school level. The students that come to universities/colleges are in the most impressionable age of their life and, therefore, can be variably moulded by the system. This decides, to a large measure, what they will be. In addition to being the "friend, philosopher and guide", a university teacher has additional academic responsibilities. He or she is required to unravel and disseminate the deeper strata of current knowledge in a given field to students at the final stages of formal learning, and thus act as a significant guiding force in their future professional life. A university student, unlike a school kid, should be able to learn to be content with guidance rather than by teaching. As stated by S. Alexander (Alexander, 1931) "University and secondary education themselves differ, not so much in kind, as in the relatively greater open-eyedness with which the object is pursued" in the university so that "one does not need to go to a University to enjoy English literature, but one does in order to enjoy it with understanding."

The true end of education is not just the acquisition of information or technical skill but a superior outlook going beyond these two. It should deepen insight, widen the horizon, and create a meaningful outlook. Education aims at developing the uniqueness and potentialities of each individual's special talents and prepares an individual for a vocation and for citizenship in a democratic community. Therefore, a good teacher is not one who merely provides more information or knowledge but is also the one who stimulates students to be

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more curious and ask more questions. Students must not be left in a state where they have 'learnt' so much that they lose interest for further questioning. Good teaching must stimulate the mind to keep questioning and searching.

Research is not discovering something totally new that did not exist earlier. We only re-search and know about something that is already existing in nature, but is perhaps unknown to us. In very general terms, research is directed to identify and understand phenomena/processes that are not understood till then and/or to find alternative and better interpretation of already known phenomena/processes. The first, and the most crucial, step in any research activity, therefore, defines the question to be answered. A successful research activity should, on completion, generate more questions so that the quest remains dynamic.

INTER-DEPENDENCE OF RESEARCH AND TEACHING

Teaching essentially generates new questions in the minds of learners who, while seeking answers engage in research and, thereby, generate next levels of questions. In this sense, the two activities are complimentary. Accordingly, quality research generally helps the teaching activity. A good academic atmosphere is essential for quality teaching at any centre of education. Since the universities are required to not only disseminate knowledge but also to create new knowledge, good research activity is necessary for a good academic environment. Although a good researcher may not necessarily be a good teacher and vice-versa, a good researcher is generally expected to also be a good teacher because of some or all of the following reasons:

1. A good researcher has innate curiosity and, therefore, is more likely to encourage students to ask questions, a primary requirement of good teaching practice.
2. A good researcher has to remain up-to-date with developments in the field and therefore, by habit, would share the latest developments with the students.
3. A good infrastructure is necessary for active research, which in turn exposes students to good research methods and practices.
4. Researchers continue to learn like students, and this helps in developing better rapport and communication with students in the class.
5. Since researchers have to remain receptive to criticism from peers, they also benefit from positive critical comments by students in the class room.

6. Teaching requires a much wider base of understanding, which would greatly expand the intellectual horizon of the researcher-teacher and thus promote more in-depth questions for research.

There is not much distinction, therefore, between a good researcher and a good teacher since the latter enables students to ask informed questions, which lead to more research and more material for the teacher to teach. And the cycle continues. Further, since the award of a PhD degree, the highest academic recognition, is based on the capability of the candidate to generate new knowledge through research, the supervisor has to be a good researcher.

Quality research cannot be driven by compulsion (as required for promotions!) or fashion (everyone does it!). It has to be an outcome of individual drive and passion.

CURRENT STATE OF UNIVERSITY EDUCATION AND RESEARCH

India has had a long tradition of academic excellence as reflected in the existence of universities like Taxila and Nalanda in historical times. Contributions by scholars in ancient India in diverse fields such as, health-care (Ayurveda), astronomy, mathematics, philosophy, linguistics, and political science are widely recognized. This tradition, however, got disrupted in the middle ages. About two centuries ago, after middle of the 19th century, the British started planning the structure of formal school and university education in India, which led to the establishment of a few large universities with affiliating colleges. A primary objective of imparting formal college and university education to Indians by the British government, as stated by Thomas Macaulay in 1835, was to produce, "a class who may be interpreters between us and the millions whom we govern, a class of persons Indian in blood and colour, but English in tastes, in opinions, in morals and in intellect" (Cutts, 1953). And, this class of persons was to serve the 'Raj'.

The universities thus established in the late 19th century fueled research in science and technology, following the western model. Starting with 27 universities in 1951–52, the number of universities (and colleges) in the country has grown exponentially; as on 31st March 2019, the University Grants Commission (UGC) recognized 907 universities in the country (399 State Universities, 126 Deemed to be Universities, 48 Central Universities, and 334 Private Universities). This number, however, remains much less than what is required for the huge population since the Gross Enrollment Ratio (GER), which reflects the percentage of 18-23-year-olds enrolled in a college or university, is still only about 25 per cent.

It is paradoxical that while the number of universities and colleges and their reach for the young populace has increased, India as a country has not made any notable mark in terms of its quality of education or research (Scaria and Ray, 2018; Shukla, 2005). More paradoxical is that many of those who acquired their higher education in India and moved to other countries for their professional life, have achieved high international acclaim but their academic 'sibs' working within the country have, generally, not come into the limelight for academic excellence. Obviously, something is amiss in the teaching and research environment of the universities and other institutions. At the national level, recognition of university faculty for national awards and honours is much lower than of those working at research institutions or other institutions of national importance. For example, only about 15-20 per cent of the current fellowship of the three national science academies (Indian National Science Academy, Indian Academy of Sciences and National Academy of Sciences India) is associated with typical universities (excluding Indian Institutes of Technology [IITs], Indian Institutes of Science Education and Research [IISERs], and the Indian Institute of Science [IISc]), although the number of faculty in these disciplines in the typical university system is much greater than those in research institutions and in the IITs, IISERs, and IISc. More worrying is the fact that a large number of graduate, postgraduate (PG), or doctoral degree-holders remain unemployable to the extent that even for a position that requires minimum qualification of having just passed class 5 of school, a large number of the applicants are PGs or even PhDs. Obviously, the quality of education is so poor that such degree-holders find themselves 'unemployable' at a level commensurate with their educational degrees.

This state is also reflected in the fact that Indian universities are way down in world rankings. Even though the world ranking of some universities in India has improved during the past several years, none of the typical universities in India ranked within the top 600 universities in world in 2019. The IISc (Indian Institute of Science) and some of the IITs (Indian Institute of Technology) ranked between 250 and 600 top institutions in the global perspective.[1]

A comparison of research activity in different areas of Science, Technology, Engineering and Mathematics (STEM) in India with those from other countries, like the SAARC and BRICS, shows that while there has been a substantially greater increase in number of researchers and research papers in the BRICS countries as a whole, the increase in China is greater than in India (Hasan and Luthra, 2014). Interestingly, these authors also found "the

performance of Indian researchers per billion US$ in publishing science and engineering research papers was better than all BRICS countries, including China." Among the SAARC countries, India's R&D expenditure and research output is better than other members but when compared with members of the BRICS, India's position is poor (Janodia, 2015). Another recent study (Banshal *et al.*, 2019) found that some of the private universities have shown good performance in the rate of their growth and research output but in terms of quality and productivity per unit expenditure, it is much less than the centrally-funded universities.

Educationists and administrators have recognized for long that 'health' of the education system in India is not great. Several commissions and task forces were set up in the past six decades to suggest ways and means to improve the quality of education and research. Despite the well-formulated recommendations provided by these commissions and task-forces, the overall picture remains disappointing (Chatterjee and Sahasranamam, 2018; Lakhotia, 1994, 2005, 2015d, 2016; Lakhotia and Anand, 2015; Tilak, 2007).

FACTORS THAT AFFECT QUALITY OF EDUCATION, RESEARCH AND INNOVATION IN HIGHER EDUCATIONAL INSTITUTIONS (HEI) IN INDIA

To impart quality education and undertake research in frontier areas, any institution involved in education and research needs:

1. Competent manpower and deserving students
2. Adequate infrastructure
3. Conducive environment and governance

The perception of the prevailing state of each of these in our HEIs is briefly given here. For the present discussion, however, only the universities (including central, state, private and other deemed-to-be-universities) and colleges, typically under the purview of the UGC, are considered in the context of HEIs; the IITs, IISERs, IISc, and various research institutions and discipline-specific (for example, medicine, agriculture, law, and management) universities or colleges are generally excluded, even though they would, *sensu stricto*, qualify as HEI.

1. Competent Manpower and Deserving Students

The 'manpower' in an academic institution includes faculty who teach, administrative and support staff who facilitate the teachers to teach, and students who learn. As an analogy, the relation between teacher and student can

be compared with the fundamental biological process that occurs at every step of development of an organism in which an unspecialized target cell (student) becomes specialized (educated and ready to take the desired profession) after receiving the appropriate signal/s (information, knowledge, and mentoring) from an inducer cell (teacher). For this process to successfully culminate in attaining a specialized state by the unspecialized target cell, it must be *competent* to recognize the specific signal coming at the appropriate time and space from the *inducer* cells so that it can respond appropriately. Similarly, students need to be competent to 'learn' what the appropriately qualified teacher is teaching. If anyone of the 'manpower' is not adequately competent/qualified or if the time and space (infrastructure) are inappropriate, the learning outcome is poor or even negative. In fact, bright and enthusiastic students stimulate competent teachers to be more effective and better. The present system of education suffers from the inadequate quality of teachers and poor learning environment, beginning from the early school level itself. Consequently, students at secondary levels and at HEIs in general do not become competent enough and fail to acquire the desired level of understanding and intellectual development. Since some of today's students become the teachers of tomorrow, the scenario presents the dismally perfect vicious circle!

In the absence of adequate opportunities for vocational streams and social respect for traditional vocations, a large fraction of enrollment in colleges and universities is accounted for by those who join these courses, not by choice, but because they do not have appropriate alternatives. Such students, dictated by the prevailing job and social requirements, just want to get a degree in the hope of improved employability. The unjustifiably low cost of education in the central and state universities also encourages the 'rush' for getting a degree. The large number of supposedly job-oriented, self-financing courses, started at most universities and colleges, without adequate infrastructure, academic planning, and competent teachers, contribute to denial of wholesome education to the potential graduates and PGs. Reservations of various kinds add to frustration of meritorious students.

The start of this vicious circle of poor teachers, poor students, and lack-lustre environment in most of the HEIs can be traced to the fact that the teaching profession has not been a profession of choice, at least for the qualified persons. This is because of:

- poorer remunerations and social recognition,
- woefully poor infrastructure and availability of funds for teaching and/or research in typical schools, colleges, and universities, and

- unethical selection of un-deserving or less-deserving candidates as faculty because of the faulty recruitment system that does not prioritize nor promote excellence.

The generally less-than-desired quality of the average faculty and students, combined with severe shortages of teachers in almost all universities and colleges, has seriously compromised the academic environment. All these factors contribute to the increasingly demoralized state of faculty in the university system and to their being largely alienated from the policy-making and implementing bodies.

2. Infrastructure

The financial resources available for HEIs in India have always been grossly sub-critical. With the increase in the number of HEIs and the number of students in each of them, without corresponding increase in financial inputs, the infrastructure has progressively become more limiting and has thus contributed to the spiraling decline in the quality of teaching-learning This is more so in disciplines that require laboratory work. Despite several schemes started by the UGC and other agencies to refurbish the infrastructure in universities and colleges, the support continues to be much less than the minimum needed for meaningful teaching or research. Although in recent years, the UGC is providing some start-up grant for research to new faculty, the amount is too small to permit a newcomer, especially in the science stream, to initiate impact-making research. When compared with the startup grant provided to new faculty in the IITs and IISERs, the grant provided in typical central or state universities is a pittance. This adds to the reluctance of bright young faculty to join the university system for an academic career. The absence of the minimally required infrastructure often 'kills' the enthusiasm of those who join the university/college system with plans to seriously embark upon a teaching and research path. This poor state of infrastructure in the university system directly correlates with the very small allocation of funds for education and research in the national budget. Compared to the condition in central universities, that in most state universities is indeed poorer and more depressing. It is obvious that the Government of India must substantially increase expenditure on R&D activities if the aim is to promote quality research and a culture of innovation (Janodia, 2015; Lakhotia, 2005; Ligade and Dengale, 2019).

Contemporary research in STEM disciplines is highly dependent on investment-intensive facilities and manpower. Universities with grossly limited

intramural funding often do not even have basic facilities, leave aside the high-end setups. Extramural funding in recent decades has helped in reducing this deficit to some extent. However, the gulf is further widened when it comes to competitive grants — a university faculty is more likely to lose to a research scientist from a better organized research institution. With basic research floundering, and in the absence of any meaningful academic links between universities and research institutions, innovative and applied research output from the university sector has generally remained low.

In order to improve the infrastructure in universities and colleges, several special schemes have been floated by different agencies over the years:

- The UGC has formulated schemes like the Special Assistance Programmes which includes DSA, SAP, and CAS levels of support, COSIST, and University of Potential Excellence (UPE).
- The Department of Science & Technology (DST) has supported many university/college departments through its FIST and PURSE programmes.
- The Department of Biotechnology (DBT) has floated several schemes that support higher education in disciplines related to the life science. Another of the DBT's programmes, the STAR College scheme, aims to improve undergraduate (UG) education in all disciplines of science in identified colleges.

Such supports are indeed very useful. However, the full positive impact of these schemes is not realized because quantum of the support and the monitoring of the programmes have often remained suboptimal. Additionally, inadequate provision for long-term maintenance and the general lack of the spirit of sharing have also limited the optimal exploitation of the facilities.

A generally less appreciated limitation of infrastructure in universities and colleges is the grossly imbalanced support for and quality of teaching and research in STEM versus other disciplines (arts, humanities, social sciences, performing, and visual arts, among others). Since much of the current ranking system relies on research output (publications and patents), the quantum of research funds generated, international collaborations, disciplines other than STEM generally contribute much less to the ranking score and thus remain neglected. Because of the societal perception that bright students have better career prospects if they join the science stream in school, other disciplines often remain deprived of enthusiastic and bright students. Consequently,

even universities and colleges that achieve relatively better ranking, fare poorly when other disciplines are considered (Prathap, 2019).

The prevailing compartmentalized system of education ensures that our universities and colleges do not provide 'liberal' and holistic education. The relatively poor state of research in fields other than STEM is also reflected in the fewer funding agencies for extramural research support in these areas. This obviously has damaging consequences for the educated youth because they come out of these institutions without a holistic perception of life. The very wide range of negative factors not only adversely impacts the overall effectiveness of HEIs but of the society as well.

3. Conducive Environment and Governance

Individual excellence cannot achieve its potential without support from peers. With the high level of mediocrity prevailing in most of our universities and colleges, those few with some potential also fail to fulfill their dreams because of negative peer pressure. The few with greater levels of determination and passion do survive but cannot achieve what they could have if the surroundings were more positively conducive.

The current process and practices involved in the selection of vice-chancellors of universities leave much to be desired. This, in combination with the sub-critical funding, poor academic vision, and capability of administrative and supporting staff in typical universities, has promoted bureaucracy and red-tape at the cost of academic progress. Governance plays a very significant role in creating or destroying the academic atmosphere. A comparison of Banaras Hindu University (BHU) and IISc, two premier institutions in the country, illustrates what good governance and positive environment can do to establish and maintain academic excellence. BHU was started in 1916 with an unparalleled grand vision and was well governed with great care and professionalism during the first few decades of its existence. Within a short time the University achieved high academic excellence, and national and international acclaim. However, a decline in the quality of its governance because of limited visions and administrative capabilities, together with dwindling resources during the past many decades, led to a perceptible academic decline, notwithstanding its continuing to have relatively high rank among Indian universities. The IISc was started about two decades before the BHU, with a great vision and has since been adroitly led by competent academicians and administrators, supported by better funding but with

little outside interference. Good academic leadership at IISc, combined with better financial support and robust faculty recruitment procedures, has helped this institution to maintain its character and eminence. Compared to many currently active universities outside India, which have maintained their quality and reputation for centuries, universities established in India during the past two centuries have aged very fast (Dattagupta, 2019). Obviously, the rapid decline, largely because of poor governance, sub-critical funding and unwarranted interference, is a matter of serious concern.

The mediocrity currently prevailing at every level does not promote an ambience of excitement and enquiry; instead it leads the institution in the direction of diminishing returns.

RESURRECTING RESEARCH AND INNOVATION IN UNIVERSITIES

For a university faculty, involvement in research is as essential a component as is teaching. The relative emphasis can vary to some extent, but a university without good research output is not a university in the true sense. The primary responsibility of faculty in a typical UG college, on the other hand, is teaching. However, college faculty are encouraged to be involved in research since this improves the academic environment and the training of students, many of whom are expected to take up an academic career. Some suggestions are presented here to resurrect research and innovation in universities in India:

1. Academic Manpower

Researchers who ask relevant questions are obviously at the centre-stage in research activity. The selection and mentoring of faculty, and the support provided to them greatly influence the research output. Teaching ability and competence for independent research of the would-be faculty must be rigorously evaluated prior to selection. The current system of Academic Performance Indicators (API) prescribed by the UGC lays greater emphasis on quantity rather than quality. This perspective should change. The method of faculty selection process in IISERs and IITs is a good model to follow in all universities. However, these institutions overly emphasize candidates' experience abroad. While experience abroad, especially in STEM disciplines, will help in enhancing research experience, the existing differences in working conditions in universities in India and abroad can be counter-productive and reduce the performance of such faculty when they are back home. Bright and young PhDs who have qualified in India could be hired as faculty and then

provided with opportunities to visit institutions in India and abroad to widen their academic horizon and develop the desired collaborations.

Following the general practice in STEM disciplines, one fallacy in the criteria for selection as faculty in universities is the unduly high emphasis placed on research publications in all disciplines. Such undue emphasis on research in disciplines such as the performing arts, visual arts, and health-care has a negative impact since the creative capabilities in these disciplines cannot be effectively assessed on the basis of typical research publications. For example, artists in any stream of performing or visual arts need to be assessed more on their musical or artistic talents and their ability to infuse that talent into their disciples, rather than in 'research papers'. Likewise expecting a faculty in a medical college to engage in high-intensity research is also unfair especially in view of the high load of patients needing their priority attention. Research in health-care related disciplines needs positions of research scientists in medical colleges who, making use of the clinical data generated by medical professionals, collaboratively publish novel and useful research results (Lakhotia and Anand, 2015). Therefore, discipline-specific yardsticks need to be used to assess the creative and teaching abilities of potential faculty.

The many vacancies that exist in almost all universities and colleges across the country need to be rapidly filled in a phased manner. To attract competent and enthusiastic young faculty to the university system, job conditions have to be made more attractive through improved infrastructural support and good governance. Subsequent vacancies should not be allowed to accumulate, since as a good administrative practice, new appointments should be staggered. This not only improves the chances of finding good candidates but also ensures against the sudden depletion of faculty in the future due to super-annuation within a limited time window.

Young faculty need to be supported and mentored well for teaching skills and research management. Universities should organize periodic training sessions for young faculty about sources of funding, applying for project funding, administrative issues associated with the implementation of externally-funded projects, ethical practices in conduct of research and dissemination of its output (Hasan, 2019). Instead of 'loading' the new young faculty with teaching from the very beginning, it may be better to start with less teaching so that they can spend adequate time in 'learning' good teaching methods and in consolidating research plans.

Good research needs competent and committed research students. We need to encourage them to take up their doctoral research within the country instead of driving them abroad! This would become possible when the academic environment and infrastructure in our universities improve. A related aspect that needs substantial and radical improvement is the quality of the various national tests, including the more common UGC-CSIR NET, for research fellowships. The present tests do not adequately examine the candidates with respect to their concepts, aptitude, and competence for research. Promoting the post-doctoral research culture within the country would go a long way in improving the quality of research in universities (Lakhotia, 2015c). Appropriate facilities and opportunities for post-doctoral research and subsequent absorption of those who do well as faculty would certainly prove rewarding, and encourage fresh PhDs to find good options in India.

The prevailing examination system, which promotes rote memory through greater emphasis on poorly framed MCQs in conjunction with very liberal marking is contributing to the declining quality of unemployable degree holders. The quality of students who enroll in post-graduate and PhD programmes in various universities needs to be improved. Admissions at most universities are based solely on marks obtained at a qualifying examination. There is an absence of real counseling to determine the capability and interest of the student. Currently, many students join these courses by default rather than by choice; better alternatives are not available. Appropriate counseling for students and their families about different courses of study and career options prior to finalizing admissions to various courses would go a long way to encourage students to make a conscious choice. A large number, who find the higher degree a 'burden' in the job market, would actually be much better off if they could be given opportunities in choosing a vocational career instead of chasing a higher academic pursuit. Besides guidance about careers, we need to develop appropriately designed and attractive vocational training courses for a large number of students by strengthening the existing Industrial Training Institutes (ITI) and appropriate stand-alone courses in colleges and universities. Opportunities for some vocational training should also be made available to all students.

2. Technical Manpower

Appropriately trained and competent in-house technical support manpower is almost absent in our educational system. In the wake of this, a large number of basic as well as advanced STEM facilities remain sub-optimally operative or

even unused. In some cases, the data collected through sophisticated facilities may not be of the desired quality just because the users are not familiar with appropriate operative principles and usages. There is an urgent need for starting appropriate training programmes and creating avenues for developing a technical support cadre. This would provide appropriate employment opportunities to many young persons who are not interested in an academic career. Such young people can provide excellent technical support so that researchers can utilize their time more gainfully in actual research rather than in trouble-shooting.

3. Infrastructure

The infrastructure required for good research output varies from discipline to discipline. A common requirement in all disciplines is accessibility to published works — books and journals. A system has to be evolved that provides free access to all published works to every faculty in the country (Chakraborty *et al.*, 2020).

Research in STEM needs more extensive infrastructure and monetary resources. In addition to providing basic laboratory facilities and need-based assured recurring grant to each faculty in all universities, additional advanced facilities need to be created and maintained at the level of individual department or university. For more expensive and advanced requirements, centralized and professionally maintained state-of-the-art facilities as inter-university centres would be invaluable. Many facilities become ineffective in the absence of competent technical staff and subsequent maintenance support. Therefore, as already stated, technical cadre and their regular intensive training are required to ensure efficient maintenance and performance of all facilities.

Depending upon the extent of usage and requirement, individual laboratories of proven accomplishments and competence could house specific advanced facilities so that their own work could progress smoothly and effectively and they could also help other researchers in optimal usage of the same.

Following up on earlier schemes of the UGC and other agencies for improving infrastructure at universities and colleges, more intensive and wholesome schemes need to be formulated and implemented. If basic infrastructure becomes available to every faculty, the sense of insecurity would decrease and the spirit of sharing would improve the utilization and output of the new state-of-the-art facilities. Encouraging collaborative studies will also help maximize the utility of facilities and of course would promote innovative research outcomes.

4. Good Governance

Vice-chancellors of universities must have a wide-angled academic vision and integrity and at the same time they should be good administrators, who can enthuse all segments of the university to achieve academic excellence. The administrative staff, especially the senior ones, should be provided formal training in administration and ICT usage so that they act as catalysts.

Rules and procedures for the implementation and utilization of project funds need to be simplified with greater freedom provided to the faculty primarily responsible for the project work. Central agencies must not attempt micro-managing the governance of universities and colleges. Autonomy of HEIs needs to be fully respected. However, it must be associated with accountability.

The fee structures in private and public (state or central) universities are generally at two extremes. The public universities must hike their fee structure to more realistic levels so that instead of subsidizing many 'students' who join various courses in the absence of any alternative or because of it being an affordable option, the resources can be utilized in providing better education and research environment to the deserving students. At the same time, adequate support should, be provided to the genuinely needy. At the other end, the extremely high fees charged by many private universities need to be checked.

The increasing number of private universities is a welcome trend. But many of the them have not invested sufficiently in developing a suitable research environment and infrastructure (Banshal *et al.*, 2019). This unfortunate situation needs to be corrected through serious monitoring with respect to the infrastructure, fee structure, remunerations to faculty and staff, and academic content. Private academic institutions must not reduce education to a business. Support for education and basic research is primarily a philanthropic activity and a responsibility of both the state and society.

Reservations of various kinds in higher education need careful re-examination and rationalization. The present system falls short of the objectives of social inclusiveness and ensuring merit as the major determinant.

5. Research in Areas Other Than STEM

A discussion on issues relating to research gets generally focused on STEM disciplines. The general lack of concern about the quality of research output in all other disciplines itself is worrying since the status of research (and education

in general) in the other domains is usually worse than in the STEM domain. This deficit needs to be addressed with priority to provide more funding opportunities in these disciplines as well.

The new Scheme for Trans-disciplinary Research for India's Developing Economy (STRIDE) recently introduced by the UGC[2] is expected to bring other disciplines in the mainstream research and creative activities since this scheme is envisaged to support:

1. Research capacity building and human resource development in all disciplines at colleges and universities,
2. trans-disciplinary research and inclusive innovation in all disciplines, and
3. high impact trans-disciplinary research in humanities and human sciences.

Hopefully the funds provided through this scheme would be based on objectivity and would be monitored for their academic excellence.

6. Assessment of Research

In principle, any research activity is self-driven. Yet it needs peer-review, mentoring, and monitoring to facilitate course-correction, if required, and to ensure accountability for funds and the faith reposed. Thus any research project funds provided directly to individual faculty or group of collaborating faculty need periodic monitoring by appropriate experts. Likewise, all departmental or institutional funds released by the UGC and other funding bodies need regular monitoring by peers and experts. This monitoring should include not only the proper and timely utilization of the earmarked and released funds but also an assessment of the proposed/expected deliverables. The funding agencies, however, need to ensure that they act as 'facilitators', not just 'monitors'. Delay in release of due grants is a common factor that derails planned work. Funding agencies must ensure timely release of funds. Investigators, especially the young investigators, may need mentoring and training for appropriate and timely utilization of funds and timely submission of correctly prepared progress reports and utilization certificates.

We need to change our parameters of assessment of research output of individuals and institutions. The current practice of using certain scientometric parameters, such as "impact factor", is widely recognized[3] to seriously damage the basic philosophy of research. Similarly, number of research papers published during

a certain period must not be the core for quantitative and relative assessment. Quality research that has some impact often requires sustained efforts over a period of time. The prevailing rules/practices that require a certain number of research publications in a defined period of time severely curb long-term research planning. Such pressures reduce the chance of any breakthrough.

Quality of research work and its output is more important. The Indian National Science Academy (INSA) has formulated detailed guidelines for the assessment of research output (Chaddah and Lakhotia, 2018). These should be followed.

7. Quality of Research Journals Published in India

A major stumbling block for research in India is the generally poor recognition of research journals, which even our own established researchers do not generally like to consider for publishing their articles (Lakhotia, 2018). At the same time, misconceived and mis-implemented policies that place undue emphasis on quantity over quality have led to the uncontrolled flourishing of 'predatory' or bogus journals (Lakhotia, 2015b, 2017; Patwardhan et al., 2018; Priyadarshini, 2017), adding to the national shame. We must effectively weed out the 'predatory' or bogus journals. The CARE unit recently set up by the UGC is expected to reduce the menace of bogus journals. Action also needs to be taken against those who deliberately continue to publish in such journals. Unfortunately, even the 'genuine' journals published by different universities/colleges in the country, although not 'predatory' in nature, are of low quality. They should either improve or be discontinued. Any research journal to be worthy of being a forum for scholarly publication must meet certain minimal standards.

India needs to develop policies that support and promote the publication of good quality and internationally-competitive research journals. Since a research journal's quality primarily depends on the quality of manuscripts submitted by authors, we need to first encourage our researchers to submit some of their research findings to established peer-reviewed journals published in India. To promote this, it may be made mandatory that at least 20–25 per cent of research output from a publicly-funded research grant is published in Indian journals with green open access. Improving the quality of journals published in India would also substantially reduce the huge expenditure incurred by different institutions and researchers in the country on 'publication' and open-access charges levied by many of the journals published by commercial houses

(Chakraborty *et al*., 2020). Dr. C. V. Raman, who was instrumental in starting the *Current Science* journal, firmly believed that for science to be good in India, the country must have good journals as well. Promotion of publication of good research journals in India needs changes in policies for assessment of individuals and institutions as well as in the mind-set of those who make the assessment. As stated in the INSA guidelines, we need to assess, "What is published rather than where it is published" (Chaddah and Lakhotia, 2018).

8. Ethics in Research

Ethical behaviour is essential, as for any other sphere of human activity, for quality research output. Unfortunately, the general global perception about research carried out in India is not high when perceived from the research ethics point of view. Besides the inordinately large number of articles published in predatory journals, instances of data manipulation, plagiarism, and other ethical misconduct in research papers as published by Indian researchers in recognized journals are also known. Unfortunately, the pressure of "publish or perish" policies and the easy availability of diverse software that facilitate the fabrication and manipulation of text, data, and images have led to a significant increase in incidences of unethical research practices. Such instances also affect the credibility of research output of more serious researchers in the country.

All faculty as well as UG, PG, and research students need to be trained in academic and research ethics. Simultaneously, a system needs to be in place for appropriate corrective or punitive action against recurrent unethical practices. At present there does not appear to be any effective institution level monitoring of the ethical conduct of faculty.

The detailed guidelines on ethics in education and research prepared by INSA[4] and the draft on the national policy on academic ethics issued by the office of the Principal Scientific Advisor to Govt. of India[5] are welcome steps. Every academic and research institution must not only ensure that such guidelines are followed in letter and spirit but also take appropriate remedial action against those found guilty of ethical mis-conduct.

9. Undergraduate Research

Except for a few universities and the newly established IISERs, most universities in India do not directly teach UG courses. These courses are largely taught at affiliating or autonomous colleges. It is generally recognized that students imbibe better quality of learning if the same set of teachers, who guide PhD and teach at PG level, interact with and teach UG students. Implementing this policy at more universities is a welcome step. But to be effective and useful,

adequate preparation in terms of faculty and infrastructure must be ensured before embarking upon UG education and research on university campuses.

It is believed that involving UG students in small research projects helps instill a sense of enquiry as part of the learning process. While this is generally true, we need to examine the justifiability and feasibility of introducing UG research projects as part of curricula in diverse disciplines under the prevailing conditions in colleges in India. Since research output of the majority of teachers in colleges and even in universities is either non-existent or of less than the desired quality, the process of defining meaningful questions and adequately guiding UG students is actually leaving a negative impact. A few students may get excited and participate in small research projects but the learning outcome for the vast majority is negative. They are actually 'learning' to fake and fudge data and plagiarize to get good grades! The teacher : student ratio is a critical factor that determines good or damaging outcome of UG research. There is a serious imbalance here, given the large number of students on the one hand, and the near absence of basic laboratory facilities and the chronic shortage of teachers on the other. The outcome of mandatory research projects at the UG and PG levels across the colleges and universities in the country is, therefore, far from satisfactory.

We need a large number of good quality open-ended laboratory and field exercises as part of the regular curriculum so that students learn basic ideas of collection, analysis, and interpretation of data and relate these with theoretical learning. Typical research projects by UG students should be carried out only in those institutions that have a track record of research by faculty and this should be optional, based on students' inclination and competence. Even at the PG level, the institution and faculty must develop basic classroom facilities and environment for research before involving all PG students in research projects.

Students in the humanities and social science streams have to be encouraged to take up socially relevant field studies to learn to collect and interpret data and using them for novel social modalities. Besides becoming aware of social issues, students would get trained to carry out investigations in social milieu.

10. Basic versus Applied and 'Mission-oriented' Research and Innovation

An oft-debated issue, especially in recent times, relates to the relative emphasis on basic and applied research. As part of this debate, innovation has also been

erroneously linked with applied research. Innovation, however, is equally applicable to basic and applied or translational research. It is of course true that innovation that results in economic gains through new product or process becomes more appealing.

A globally accepted primary philosophical underpinning in establishing universities and research institutes was that universities would largely engage in creating new knowledge while research institutes would generally be "mission-oriented" and would also act as the translators between the creators of knowledge and the industry, the ultimate utilizer of new applied knowledge. Unfortunately, for a variety of reasons this model did not effectively work in India with the result that there are very few instances of innovative research that could be effectively applied and translated into new products or processes. Since the research institutes were setup as stand-alone organizations with different governance principles and with better funding than the universities, strong academic linkages between universities and research institutions never developed.

While undertaking and promoting basic research, issues that are of local relevance also need to be emphasized. For example, the very rich biodiversity in the country needs to be exploited for research in all domains of biological sciences, rather than for just cataloguing of the diversity. The oft-emphasized 'glorious' achievements in science in ancient India need to be extensively researched through unbiased enquiry rather than being initiated only to "prove the point". Well-planned studies undertaken with the required scientific temper alone will help us separate myths from reality and thus provide meaningful interpretations of the ancient wisdom. Such unbiased studies may also generate new processes and products useful for applications.

Mission-oriented research may be considered in two different contexts:

- Research carried out in institutions that have their defined missions and priorities, and
- Research undertaken by university faculty, individually or in inter- or intra-institutional collaboration, under a programme or project specifically funded for research in a defined national mission.

The participation of university faculty in such national mission-oriented research programmes should not be mandatory but should be based on individual competence and choice.

Applied or translational research, especially in relation to national requirements is necessary. However, mandating or even over-emphasizing it in the university system, at the cost of basic research, is not desirable (Lakhotia, 2015a). Quality basic research remains the fountainhead for applied research. Therefore, in the absence of new basic knowledge, innovative application would remain a mirage. More importantly, expecting innovative high-quality translational work from the present system may appear premature. While promoting and improving basic research in the university system, it is useful to provide opportunities for testing innovative ideas for their translatability. In this context, the many innovation parks and bio-clusters being setup in typical universities to nurture and mentor start-ups is a welcome step and should bring good dividends. In the name of translatability, however, poor quality 'applied' research must not be promoted, as may happen when funding for basic research is curtailed while the meagre available funds are diverted to the so-called "mission-oriented" projects. Primary focus in the university system must be on high quality basic research in all disciplines since that alone can create inquisitive minds, the primary responsibility of the university system in any society.

Functional and academically productive linkages between research institutions and university system have to be promoted and strengthened. Unlike in India, most advanced countries known for high quality basic as well as applied research have not segregated research institutes and universities. It may neither be possible, nor desirable at this stage, to bring about a radical change in the current organizational setup. However, adjunct appointments across the two systems could provide a beginning for improved academic exchanges between the two streams and mutually beneficial research collaborations. New research institutions must be opened within the ambit of the university system.

It is in the long-term interest of the industry to invest liberally in promoting quality basic research in universities. This will not only facilitate the development of good infrastructure and a competitive environment in universities but will also provide better linkage and understanding between academia and industry, which is essential for innovative applied ideas to fructify. Stringent quality control measures on the part of local industry will go a long way in generating the public's confidence in industry-supported indigenous R&D efforts leading to commercial products/processes.

11. Societal Confidence in Indigenous Technology

As a society, we place high confidence on 'imported' goods and machines or equipment, despite the powerful *Swadeshi* movement in pre-independent

India. Such societal preferences have thwarted industry from supporting research leading to develop novel indigenous technologies, which in turn has discouraged many researchers from developing innovative technologies and processes (Lakhotia, 2015a). Even when developed and patented, majority of these innovations remain unexplored. Societal preference is rooted in the generally poor-quality control exercised by authorities as well as by the industry so that, even if less expensive, the utility and quality of indigenous products often remains less than desired. To break this vicious circle, we need a multi-pronged approach, especially in the rigorous maintenance of quality control and supporting sincere efforts of our researchers in innovating and developing appropriate technologies that meet the country's conditions. Importing technologies for manufacturing within the country, as seems to be happening under the "Make in India' programme, would not really catalyse and support indigenous innovative technologies. We need another *Swadeshi* movement for promoting innovative, robust, and reliable translational research. The industry must proactively participate in such research and ensure stringent quality control at every level. However, as stated earlier, high quality basic research must remain the primary focus in the university system.

12. Internationalization of Education

With a view to attract more resources for higher education in India and with a view to improve word ranking of our HEIs, considerable emphasis is being placed on 'internationalization' of education so that campuses of renowned international universities can be setup here. Indian universities are encouraged to sign agreements with foreign universities for research collaborations and to attract more students from abroad to study in India's HEIs. All these steps are laudable. But, we need to ensure that we internationalize our HEIs on a competitive basis on a level platform, rather than remaining at the receiving end. Many of the MOUs between universities in India and abroad have remained ineffective because of the absence of a level-field. We need to ensure that the existing HEIs do not get depleted of their competent faculty because the working conditions in the international institutions become much better. The existing HEIs need to be brought to a much higher level to provide an equitable playing field for healthy competition and collaboration.

There is a need to attract more international students in India's HEIs. This requires that the academic quality of incoming students as well as the quality of education offered must remain excellent. It would be counterproductive to have a large number of international students to join here primarily because,

even after paying higher fees than local students, the costs work out to be much less than what they would pay in advanced countries and they would still get the desired degree with relative ease. This leaves a scope for 'buying' a degree without acquiring the required expertise and knowledge. Such a situation would obviously have a negative impact in the long-term. Instead of encouraging the enrolment of a large number of 'international' students in various universities and colleges just to improve the 'ranking' or 'earning', it is essential to ensure that the quality of education imparted is high and that the international students who come here are genuinely attracted and interested in the learning and acquiring skill, rather than just getting a degree at relatively low cost.

CURRENT 'RANKING' SYSTEMS

A variety of 'ranking' parameters, aimed at providing pointers to different stake-holders (funders, prospective faculty, students), are currently in vogue at the global and national levels to provide relative ranking of different universities and other academic institutions (Pietrucha, 2018). A major factor that influences the ranking relates to research and international collaborations. It is important that the standing of our HEIs is improved on these counts.

Most of our HEIs are not able to take advantage of achievements of their alumni because of the absence of any meaningful archives of former students. We also pay an indirect cost of the "brain-drain" on our institutions' ranking. The competence of our alumni, primarily developed in India, gets exploited by institutions in other countries where they undertake further research. We need to develop effective mechanisms to facilitate the country's best brains to continue working successfully within the country's HEIs. This would ensure that their ranking would be much better than what it is now.

The present ranking systems seem to emphasize quantity over quality. Besides examining societal benefits through scientific discovery, economic outcomes, and public health impact (Vernon *et al.*, 2018), assessment of research output from universities should place equally important emphasis on novel concepts that emerge from basic research. The three dimensions of research outcomes: scientific impact, economic outcomes, and public health impact (Vernon *et al.*, 2018) must be judiciously and rationally used for evaluating research performance of universities.

The diverse "ranking parameters" being developed and used by different agencies will have their own commercial and vested interests. This happened

when the "impact factor" of journals was inappropriately applied to rank individuals and institutions; and this led to an unhealthy race between journals to secure a higher impact factor. The high emphasis on parameters such as patents, research grants, industrial and international collaborations for ranking is pushing the other academic disciplines into the background. This does not bode well for the inclusive academic excellence and scholarly atmosphere across a university.

CONCLUSION

Quality of research and innovation primarily depends upon the quality of education that our HEIs provide. Education is not a process of filling an "empty vessel" with information and the learners are not passive recipients of "ready-to-use" packages of information. Education or teaching is a bidirectional interaction between the teacher and the learner. Dr. Sarvepalli Radhakrishnan, one of the greatest educationist and philosophers of recent times, stated, "To help the students to earn a living is one of the functions of education, *earthakari ca vidya*" but "education, according to the Indian tradition, is not merely a means of earning a living …. It is initiation into the life of spirit, a training of the human soul in the pursuit of truth and the practice of virtue." Dr. Radhakrishnan also said, "all education is, on the one side, a search for truth; on the other side, it is pursuit of social betterment" and, therefore, "any satisfactory system of education should ….. insist on both knowledge and wisdom, *Jnanamvijnana-sahitam*. It should not only train the intellect but bring grace into the heart of man."

Creating a good academic ambience at HEIs would ensure quality education that meets the above objectives. It would also keep faculty and students excited and curious, and thus initiate and catalyse high-quality research and innovation. For this, the process of hiring faculty in HEIs needs to be radically modified to make it robust and objective so that only those who are interested in, and competent for teaching and research, join the universities and colleges. They need to be mentored and supported well. At the same time, the government needs to initiate a quantum leap in its investment to develop and maintain an optimally essential infrastructure and academic environment across the universities and colleges so that they become attractive for competent and interested faculty. The UGC obviously has a major role to play in framing appropriate policy guidelines, providing the required optimal financial support and autonomy with accountability to the different universities and colleges. Long-term sustained high quality of research and innovation in HEIs

is essential for India's global leadership. The country's enormous youth power is looking forward to good and holistic education.

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CAPACITY BUILDING OF FACULTY FROM HIGHER EDUCATION

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INTRODUCTION

Global forces, such as the growth of the knowledge economy and recognition of the important role of higher education (HE) in national development has put Higher Education Systems (HESs) worldwide under tremendous pressure to increase performance. (Power, Millington and Bengtsson, 2015). If HE has to contribute to the national development, its product the graduates must have the knowledge base, attitude and skill set to contribute significantly. It is disheartening to see research findings that 70 to 90 per cent of graduates of various streams of the Indian HES are unemployable. Employability is not the only criterion for judging the performance of the HES but it is one of the most important criteria.

Why does our system fail to deliver? The answer can be found in the three main areas: Funding, Governance, and Pedagogy.

Here we are relating more specifically to the third area, that is, Pedagogy which has the following lacunae:

1. Curriculum
2. Teaching-learning strategies
3. Assessment system

In addition to these three lacunae, there are two more areas that need attention in the HE field: updated knowledge base in one's domain area; and research capabilities of faculty members. These areas are directly concerned with the faculty in HE. That is why capacity building of faculty is an essential function of the HES. We shall discuss here how capacity building of faculty can be enhanced, geared up, and made functionally effective.

CAPACITY BUILDING AND CAPACITY DEVELOPMENT

The most important factor in the success of Higher Education Institutions (HEIs) is the quality and engagement of its faculty (DNEP, 2019).

In the Indian HES, faculty members are appointed as Assistant Professors with required minimum educational qualification. This is the beginning of

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their career. They generally join with a Master's degree and now recently, with a PhD degree. But there is no requirement of any previous teaching-related knowledge or skill set. Hence it is important to arrange for capacity building. This refers to building something new. Capacity development refers to developing existing skills and knowledge. For the new entrants it is capacity building of teaching-related knowledge, attitude and skill sets, whereas for those with some experience it will be a Capacity Development Process.

The United Nations Development Programme (UNDP) sees capacity development as the process through which individuals, organizations and societies obtain, strengthen, and maintain the capabilities to set and achieve their own development objectives over time. Simply put, if capacity is the means to plan and achieve, then capacity development describes the ways to those means. An essential ingredient in the UNDP capacity development approach is *transformation.* For an activity to meet the standard of capacity development as practiced and promoted by UNDP, it must *bring about transformation that is generated and sustained over time from within.* Transformation of this kind goes beyond performing tasks; instead, it is more a matter of changing mindsets and attitudes. (UNDP, n.d.)

NHSRC (n.d.) defines capacity building (or capacity development) as a process that improves the ability of a person, group, organization, or system to meet objectives or to perform better. The terms Capacity Building and Capacity Development are used interchangeably here.

INDIAN HES AND CAPACITY BUILDING OF FACULTY

The Indian HES is one of the largest in the world in its tremendous spread and scope. According to All India Survey of Higher Education (AISHE, 2019) there are 14,16,299 teachers presently serving in the HES in India It is a great challenge to provide continuous professional development to all the teachers every year or even at least once in three years.

The Ministry of Human Resource Development (MHRD), Government of India, has been publishing reports of AISHE every year, since the Survey was initiated in 2011. Table 7.1 gives an idea of the vast scope of the Indian HES.

Table 7.1: Number of Institutions, Students and Teachers in Higher Education

	No. of Universities	Colleges	SAI	Teachers	Students (in Lakh)	GER	PTR
2011-12	642	34,852	11,157	12,47,453	292	20.8	21
2012-13	667	35,525	11,565	13,08,571	302	21.5	20
2013-14	723	36,634	11,664	13,67,535	323	23.0	21
2014-15	760	38,498	12,276	14,73,255	342	24.3	21
2015-16	799	39,071	11,923	15,18,813	346	24.5	20
2016-17	864	40,026	11,669	13,65,786	357	25.2	22
2017-18	903	39,050	10,011	12,84,755	366	25.8	30
2018-19	993	39,931	10,725	14,16,299	374	26.3	29

SAI: Stand Alone Institution
GER: Gross Enrolment Ratio
PTR: Pupil Teacher Ratio
Source: AISHE reports, MHRD. 2012-2019

With 993 universities, about 40,000 colleges, a little less than 11,000 stand-alone institutions (not affiliated with universities, which are not empowered to provide a degree and therefore run diploma level programmes), 14 lakh teachers and 374 lakh students (in 2019) the Indian HES is one of the largest education systems in the world. (in 2018, China had 480 lakh students and its GER was 48 per cent as against India's GER of 25.8 per cent in 2018.)

In the Indian HES, at present, pre-service teacher training is not an entry-level job requirement (assistant professor level) and hence almost all teachers entering into the HES are untrained to 'teach' especially to 21st-century HE learners. They need capacity building in pedagogy, which can be one of the important component of the Capacity Building Programme for the teachers of HE.

MHRD has initiated many capacity building programmes or schemes. Faculty Capacity Building (FCB) for HEIs was envisaged in 1986 after the National Policy on Education (NPE) was introduced and Academic Staff Colleges (ASCs) were established in universities from 1987. In each Five Year Plan the number of ASCs increased. In the twelfth-plan period there were 66 ASCs.

The University Grants Commission (UGC), in pursuance of NPE-1986 and its programme of action, set up the 66 ASCs in different universities and institutions in the country. The ASCs conduct especially designed orientation

programmes for newly appointed lecturers and refresher courses for in-service teachers (UGC Guidelines, 2012).

The NPE-1986 in its programme of action makes a pointed reference to the crucial link between teacher motivation and the quality of education. It recognizes the need for improving the status of teachers and proposes providing opportunities for professional and career development so that teachers may fulfil their role and responsibility within the system of HE. It also proposes enhancing their motivation skills and knowledge through systematic orientation in specific subjects, techniques and methodologies, and thereby inculcates in teachers the right kind of values that would encourage them to take initiatives for innovative and creative work.

The name Academic Staff College (ASC) was changed to Human Resource Development Centre (HRDC). Presently there are 66 HRDCs in India, which conduct faculty orientation as well as refresher courses in various areas.

The Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching scheme (PMMMNMTT) was introduced during the Twelfth Five Year Plan (2012-17) and was formally launched by the Hon'ble Prime Minister on 25th December, 2014. It has been extended till March 2021.

In November 2018, the Annual Refresher Programme in Teaching (ARPIT) was launched by the MHRD under PMMMNMTT. It is a major and unique initiative of online professional development of 15 lakh HE faculty using the Massive Open Online Course (MOOC) platform, Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM). For implementing ARPIT, 75 discipline-specific National Resource Centres (NRCs) were been identified in the first phase, tasked to prepare as specified (ARPIT, 2018):

- online training material with focus on latest developments in the discipline,
- new and emerging trends,
- pedagogical improvements, and
- methodologies for transacting revised curriculum.

In 2018, the NRCs were expected to cater to around 13-lakh faculty of the total 15-lakh faculty in HE. The courses were opened in 2018-2019. The second round of ARPIT was initiated in 2019-20.

Teacher Training under Education Quality Upgradation and Inclusive Programme (Equip) Of UGC

EQUIP (focused on the period of 2019-2024) very aptly distinguishes two types of training programmes: for the newly recruited assistant professors in the first five years of their job; and for those already serving in the HEIs for more than five years. For them it would be a Continuous Faculty Development Programme (CFDP). EQUIP has made some significant suggestions for achieving teacher professional development (Chapter 2) some of those are listed here:

1. Develop professional standards for faculty in HEIs.
2. Expand institutional structures for organizing Faculty Induction Programmes (FIPs) and train newly appointed assistant professors.
3. Expand institutional structures for organizing programmes aimed at continuous professional development of faculty.

Within the next five years it plans to take refresher programmes for the continuous professional development to six lakh teachers in HEIs (about 1,20,000 per year).

UNDERSTANDING 21st CENTURY LEARNERS

In 2020, there are 374 lakhs youth studying in the HES in India (with a GER of 26.8 per cent) and it is expected that by 2030, there will be more than 700 lakh youth in HE (50 per cent GER). All these are 21st-century learners and they have peculiar characteristics and attributes. Unless the faculty is well versed with them, the 'teaching' process they plan for them will prove futile.

Learning Skills

The 21st-century skills under the Fourth Industrial Revolution (Education 4.0) for 2020 are listed by the World Economic Forum as follows (Schwab , 2019):

- Complex problem solving
- Critical thinking
- Creativity
- People management
- Coordinating with others

To help students develop these skills, it is essential that faculty from HEIs possess them and also know how to help learners develop them. These skills cannot be developed through lecturing. Faculty must master the instructional design through which these skills can be developed effectively and efficiently.

Learners' Expectations

The NextGen learners have high expectations from the HEI where he or she spends three to five years. Two primary expectations are:

1. Employability. Each student expects to get a job where the skills and knowledge base developed during degree or diploma programme will be applicable and useful.
2. The use of ICTs. The NextGen is an "always connected" generation and has grown up using technology. They have been using various technology tools for many years and therefore expect the teachers to use such technology tools to a great extent (and not just lecture with PowerPoint presentations). They have information at their fingertips and hence do not appreciate the mere transmission of such information from the teachers. They are also used to creating small communities and addressing any problems or issues themselves.

Available Technology

Several types of ICT tools and platforms are available today (which are also ever-changing) for the 21st-century learners and their teachers. The main advantage of these tools and platforms is that they support communities of learners (provided the teachers use them as well). This technology allows learners to generate content (user-generated content and not just teacher-generated content) in such forms as videos, podcasts, texts, multimedia, games, maps, and models. This phenome provides immense opportunities to teachers to interact differently (and not only in one to many communication) with their learners.

AREAS OF FACULTY CAPACITY BUILDING

More than 55 per cent faculty members in the HES are assistant professors, the new entrants, or with maximum four-to-six years of experience of teaching. It is important at this stage to learn about research and developments in one's own domain area. It is also essential to learn new trends in pedagogy appropriate for the 21st-century learners in HE. In this technology era, information is growing at a faster pace. To keep up with it, the faculty also need to learn

the integration of information and communication technologies, which are changing the environment of HE.

As the faculty moves up the ladder of seniority from Assistant Professors to Associate Professor and then Full Professor, they are expected to contribute more to the development of their institution as well.

The British Council (2014) report on "Understanding India" discusses teacher development. The report is based on over fifty face-to-face interviews with HE leaders, academics, and policy makers in India. The report states:

The primary concern for all institutions interviewed was the poor quality of teaching in HE across all levels of study, particularly at undergraduate level. Interviewees recognized that poor learning outcomes in many Indian institutions had at its roots the following interrelated issues:

- Lack of teaching skills in faculty and limited understanding of the learning process.
- The use of outdated pedagogies (input-oriented, lecture-based approaches, rather than student-centred, enquiry-driven and outcomes-based).
- Outdated and inflexible curricula.
- A rigid assessment system, which encourages rote-learning and does not test students' broader skills or deeper learning.
- Lack of an effective quality assurance system for teaching and learning.

The DNEP-2019 suggests that each institution that prepares its own Faculty Development Plan should include capacity development in:

- field/discipline
- pedagogical capacities
- research
- contribution to practice

Institutions could consider putting in place a mentorship programme for young faculty members and a self-assessment tracking system that would encourage faculty to assess their own progress and learning. (DNEP-2019: 13.1.7)

The concerns about the quality of HE should be addressed and one of the solutions is FCB. This needs to be arranged in four major areas:

1. Curriculum Design and Implementation
2. Twenty-first Century Pedagogy and Integration of ICT: Teaching-learning-assessment strategies appropriate for GenNext learners including integration of Information and Communication Technologies (ICT)
3. New Developments in the Domain Area
4. Research-related Capacities

The senior faculty of the Associate and Full Professor levels should have components of management and administration of HE in their capacity-building programmes. They also may need inputs on mentoring as their role as mentors gets progressively more important.

1. Curriculum Design and Implementation

Although the curriculum is designed by a separate board or committee, the teaching faculty should have a say and must know the process and importance of curricular reforms.

"Curricular reform is not just a matter of changing the curriculum. It often requires a paradigm shift among all involved: the higher education institution administration, the teachers, the students, especially if stakeholders outside the higher education institution are to be involved" (Erasmus+, 2016).

There are many universities in India which are either reluctant or find it challenging, to reframe the curricula and modernize those appropriately for the 21st century especially for Education 4.0.

2. Twenty-first Century Pedagogy and Integration of ICT

Education for the 21st century needs to be very different from that of the 20th century. The teaching learning strategies need to be different. The focus has changed:

- Shift from teacher-determined strategies to learner determined;
- Provide more control to the learner;
- Transfer facts and information to co-creation of knowledge by the learners,
- Change focus on inputs to focus on outcomes, and
- Improve the learning process.

The focus on outcomes also has transformed the assessment and evaluation process from memory-based and fact-based evaluation to assessing higher

order learning outcomes such as applying, analysing, evaluating, and creating. Student learning is of utmost importance.

These changes are transformatory and faculty need to learn about the same. In India, most faculty members are not aware of these changes and hence the area of teaching-learning and assessment remains an important area of FCB.

Information and Communication Technology (ICT) is transforming all aspects of life including professional life. Without ICT it would just not be possible to interact with others: colleagues, learners, experts from around the world, and build a team. Today the process of learning is taking place both in the face-to-face and blended and online mode. ICT is becoming the base of all processes in education, assisting teachers and learners to attain their maximum potential.

3. New Developments in the Domain Area

In HE, as opposed to school education, the generation of new knowledge is of paramount importance. Our learners must be tuned to this aim. Faculty would therefore need to keep themselves abreast with the new developments in their domains and in the allied fields of knowledge. There are no watertight compartments within various fields of knowledge (silos) and therefore understanding other related (and unrelated fields of study) are very important. Each field of study has its own methods of generating new knowledge and that also becomes important content of the FCB.

4. Research-related Capacities

New knowledge is generated mostly through research. Research methods, tools, and techniques of data collection and data analysis, get advanced and with the advancement of technology many tools and platforms get available to address phases of research in a more sophisticated manner. Interdisciplinary research also proves important in addressing many comprehensive issues related to societal problems. Faculty needs to keep abreast with these developments in the area of research.

TYPES OF CAPACITY BUILDING PROGRAMMES

The FCB programmes will be varied in nature, as they may have to be organized in the content (domain) areas, in pedagogy, management of educational institutions, research, and such other areas. Each of these will be required for the teachers at various levels of their professional career. The variety of capacity building programmes must be provided to satisfy varied needs.

The modes of such training programmes can be face-to-face, blended, and online. Even if different modes are used, the central idea must be to implement learner-centred pedagogy. If the attributes for graduates such as innovative, problem solving, investigative, team member, and creative are aimed at then the pedagogy cannot be teacher-centred. It must be learner-centred and the teachers must practice the same in their classrooms. The teachers need to master this pedagogy. Hence the training programmes must use this pedagogy to provide first-hand experience (immersive technique) to participating teachers.

FCB is a fulltime training programme of two-to-three-week duration. But there are many types of capacity-building programmes that can be conducted. Some examples of these could be:

- Study visits to industries or related organizations
- MOOC-Online courses (as offered on SWAYAM and ARPIT)
- Participation in online community of practices
- Participation in mentoring programme (attach a mentor to faculty members).

Approach to FCB

While using many different approaches, planners and organizers of FCB programmes must ensure that this is not an arbitrary and ad hoc activity. FCB must be based on rigorous planning, sound instructional design and national, State, and institutional needs.

A five-phase instructional design approach is suggested::

1. Prepare teaching standards for HE teachers.
2. Assess capacity needs of faculty members against the standards.
3. Prepare a capacity building plan.
4. Implement the plan.
5. Assess the programme outcomes.

Based on the capacity needs a comprehensive capacity building plan for an institution, the State, or for the whole country can be prepared. Since education is on a concurrent list, both the State and Central governments need to shoulder the responsibility.

MODES AND MODELS OF FACULTY CAPACITY BUILDING

FCB programmes are conducted using three modes:

- Face-to-face mode
- Blended mode
- Online mode

Face-to-face: This mode is the most prevalent and widely-accepted mode. Faculty members from different parts of the country are invited to a two-to-three-week programme. Resource persons are also invited from different parts of the country. An orientation programme of refresher courses is usually used to implement this mode.

The programmes, generally, do not state higher order learning outcomes. The two lowest ones remembering and understanding, are mainly aimed at. The higher order learning outcomes like applying, analysing, evaluating, and creating are generally not addressed. This can also be a drawback of other modes like blended and online modes.

Drawbacks of the face-to-face mode

The resource persons may not have an overview of the programme and who is conducting which session so there may either be overlapping or omissions. This happens because, generally, the resource persons are invited from different places and are not invited on any online platform together.

1. The resource persons, who are mainly domain experts, may not be aware about the pedagogy appropriate for FCB. Most resource persons use the 'lecture' method supported by some presentation, overburdened with text.
2. There is no connectedness of learners (the faculty members in this case) and resource persons before, during, or after the workshop. The faculty members do not have anyone to approach in case of some guidance is required.
3. High expenditure is incurred for the lodging and boarding of the participants. Time and human-power is invested in ensuring the smooth operations of staying arrangements of 35-40 participants for two-to-three weeks.
4. Many experts around the world are willing to share their valuable expertise. They cannot be invited to face-to-face programmes due to overall cost. The participants therefore, miss the interaction with such experts.

Keeping these drawbacks in mind, the use of face-to-face mode needs to be reduced and alternative modes explored. Four models of FCB, which have been explored and used extensively are listed and discussed here:

1. Technology Integrated Model (Blended Learning)
2. Fully Online Model
3. Workplace Situated Model
4. Learning Communities Model

1. Technology Integrated Model (Blended Learning)

The characteristic feature of the 21st-century learners is that they are "always connected" using some electronic device. We certainly cannot teach them using 19th- and 20th-century teaching methods! Faculty members need to integrate technologies into their teaching-learning-evaluation processes.

Faculty members' use of ICT in their teaching-learning process

As observed in a study on the participants of twelve FCB programmes:

- more than 90 per cent teachers do not use blogs;
- more than 80 per cent teachers have not used any Learning Management System (LMS);
- more than 60 per cent teachers have not used Google drive (and hence have no knowledge of "sharing resources");
- about 75 per cent teachers have not used the Google calendar;
- more than 70 per cent have neither heard of nor used any sharing tool (such as Slideshare)
- Many consider the use of a PowerPoint presentation as the ultimate use of ICTs.

More than 99 per cent use WhatsApp as a mobile-based communication tool but very few have used it as teaching-learning-assessment platform. They have not used the mobile phone for teaching purposes. Many use it for administrative purposes for example, for giving instructions and, sharing schedule)

Learning takes place through active participation. There are ICT tools available by which the lectures and presentations can be shared. Even the resource persons invited for FCB programmes do not integrate ICTs into their teaching sessions. They also rely mostly on PowerPoint Presentations.

How faculty members can integrate ICTs into their teaching:

- The resource persons must use appropriate technology tools in their session.
- Give first-hand experience to participants. Instead of explaining the concept of features of a blog, the resource person should create a blog and invite participants to write their comments and posts. This applies to all new pedagogies and technologies.
- Instead of lecturing participants about the concept of cooperative learning the resource person could 'teach' a topic through the Jigsaw teaching strategy and then explain the concept of the strategy called 'Jigsaw'.

The blended learning model provides the opportunity to the resource person to use technology platforms such as LMS, or technology tools for creating, storing, sharing learning resources, and for assessment. In the blended learning model face-to-face and online modes are suitably blended. The important parameters are:

a) If the programme is for three-weeks and faculty are invited from different parts of India, interactions could be conducted using following combinations:

- In the first and third weeks in online mode and the second week in face-to-face mode.
- First two weeks in online mode and the last week in face-to-face mode.
- First week in the face-to-face and last two weeks in the online mode.

If the programme is workplace based (at the home institution) these two modes can be gainfully employed even on alternate days.

b) Extensive planning is essential for a programme in the blended learning mode. Learning objectives and learning outcomes for each week's interactions must be spelt out. The appropriate blend of face-to-face and online activities ensured.

c) Blended learning has a component of online learning and hence the technology accessibility has to be checked. It is advisable to use LMS (for example, Moodle — an open source learning system). A class has to be created and prior invitations sent to all participants. This enables the organisers to confirm that all participants have access to LMS from their device. In recent studies it was confirmed that 90 per cent or more students

in HE in India do have access to Internet on their devices. (Bhagat, 2019; Koneru, 2019, Chan Mow, 2019; Shinde, 2016)

d) The advantage of using LMS in the FCB programme is that all resource persons are invited as teachers to the online class and they creates the resources for their sessions. The resources are accessible to all resource persons unlike the face-to-face mode. The resources are available to participants even after the programme is over.

e) Since all the learning resources are shared with participants well in advance there is no need for lectures. Many activities, such as, cooperative learning strategies, can be organized in the face-to-face mode to involve learners. Learning takes place when the learner is actively involved in the process of "meaning making".

f) The online component of blended learning allows group work asynchronously..

g) Face-to-face interaction can be used for creating a product, for example, using online resources. Excellent group work can be achieved using synchronous (in face-to-face) and asynchronous (in online) modes.

h) Formative assessment tools can be fruitfully integrated in the online mode giving adequate time to participants to check their progress.

The role of the organizer of the blended learning programme is critical. He or she must be very well conversant with both face-to-face and online modes of interactions to blend the two profitably. It is time to move away from the face-to-face mode towards the blended learning model.

2. Fully Online Model

The online learning model will essentially be used in the immediate future. We are all witnessing a great shift in the interactions of teachers-students in the HES today. Today it is a compulsion for all teachers to go online. Everyone is exploring ICT platforms and tools to go online and to take classes. But so far, this has only meant "lecturing online". The teachers are using tools such as Zoom, Facebook, and GMeet to deliver 'online' lectures to their students. in the face-to-face mode. This is abuse of a technology that has immense potential of making teaching-learning interactive, actively involving students in the process of learning, using various tools that are mostly freely available (although may not be open source).

The online learning model of FCB implies that there is no face-to-face interaction between the teacher and learners, (resource persons and faculty

members). The use of LMS and other plug-ins for synchronous interaction, such as BigBluButton, Skype, A-VIEW, and Google Meet are necessary. This is a live interaction model. An alternative model is designing, developing, and implementing an online course (for example, MOOC) where live interaction is restricted to posts on discussion forums.

Online workshop as a part of a larger face-to-face model

In this prototype the participants (ranging from 35 to 60) were sitting at one university for a face-to-face capacity building programme. I conducted the workshops (duration three hours to two full days) from my place. Skype was used for the synchronous interaction (projected on a screen placed in the classroom) and other collaborative tools, such as, Google Drive (slides, drawing, forms, documents), Padlet, Blog were used, where learner interaction was sought. LMS was also introduced. Participants were initially surprised to experience this remote teaching where the teacher knew what was happening in various groups, with the help of collaborative tools. The students' or learners' queries and difficulties were clarified on Skype. The live synchronous interaction was as pairs, as small groups, and as a bigger group. Participants also enjoyed asynchronous interaction with others using online tools, such as discussion forum, blog interaction through comments, and new posts.

The participants were happy in actively participating in the process of learning, formative assessment, and creating something new, like, learning resources.

Online workshops by the Teaching-learning Centre (TLC) of SNDT Women's University, Mumbai

One more prototype was tested during the period of social distancing with a project of the Teaching-learning Centre (TLC) of SNDT Women's University, Mumbai. The TLC organised eight online workshops (three hours per day for eight days) and 750 participants (Faculty from colleges and universities) from 23 states of India registered for these workshops. TLC created 15 online classes of 50 participants each on Moodle LMS. There were 15 mentors assigned to these 15 classes. There were also 15 WhatsApp groups for these participants.

Two ICT tools were introduced everyday through synchronous sessions of one hour each. For this purpose, the "Facebook Live" platform was used along with OBS, Studio which provided the facility of simultaneous video and screen-sharing. Many such synchronous combinations, –such as, BigBlueButton, A-View, Video conferencing or live streaming platforms such as Lark, Facebook

Live, Google Meet, Skype, and Microsoft Meet, for screen sharing, could also be explored and used. It was a combination, which facilitated live interaction between the resource person and participants. The participants' queries were seen on the screen and the resource person answered some; amazingly, some participants, who understood the tool well or may have used the tool previously, commented on the queries, and answered them as well. This was a very valuable interaction format.

The participants were free to interact on the WhatsApp group as well as on the discussion forum of the Moodle LMS of their class after the daily workshop. The feedback from the participants about this prototype of Online Learning Model was very encouraging.

Online Courses (MOOC)

The regular approach to the online learning model for FCB is joining an online course, such as MOOC. MHRD has created a SWAYAM platform to offer MOOCs both for faculty and students of HE. As stated above, ARPIT was launched by the MHRD in 2018 especially for the faculty members and is offered in a fully online mode.

The online course model becomes effective if it plans and invite learners to interact, form groups, work with small groups online to discuss or to create something new. Without such interactions, only recorded videos and text become monotonous and limited. These MOOCs can be called as xMOOCs (structured design).

George Siemens and Stephen Downes, two experts from the online learning field and pioneers, are credited with the first ever cMOOC (MOOC based on Connectivism) in 2008. What made it more appealing to learners is a web of interaction among the learners through variety of tools and processes.

Resource persons designing and developing MOOCs must be oriented towards the role of interaction among learners during the process of learning (Social Constructivism as proposed by Lev Vygotsky). Presently, many MOOCs on SWAYAM are of xMOOC type and invite no or very little interaction. The whole purpose of learning and applying the knowledge and skills in the workplace will be defeated through such radarless efforts.

Webinars

Many experts are organising Webinars for interested faculty members worldwide. Department of Educational Technology, SNDT Women's

University introduced Webinars more than 12 years ago in their Master's degree programme on eLearning.

Webinar is a useful method of online interaction. A panel of experts present their ideas on the topic and then there are question-answers from participants-expert panellists. This is an online version of a face-to-face seminar and is effective in discussing relevant issues.

3. Workplace Situated Model

Workplace situated capacity building is when all or most faculty members are provided capacity building in their own institution, thus improving the chances of applying the skills learnt. A 'training' model away from the workplace is generally of didactic' in nature. A short-term training programme away from the faculty's institution, could be fragmented.. One or two teachers are invited from one institution for a national or state level FCB programme they are not able to apply what they have learned. This is primarily because there is no "critical mass" of faculty members from the institution to take forward the skills learned and the knowledge base. Three case studies of FCB learning at workplace are given here:

Case Studies: FCB at Workplace

Case 1: PVDT College of Education, SNDT Women's University Training at workplace

The principal, Smt. Shakuntala Mehta felt that sending one person training organised at another institution, would mean quality loss in communicating those skills and knowledge bases to other members of the teaching faculty. She invited experts including proponents like Dr. Bruce Joyce, from NCERT, and other organisations to SNDT Women's University and first-hand experience of learning new trends, such as microteaching, models of teaching, and new assessment strategies were provided to faculty.

Post-training discussions among the faculty members, on application of new techniques to B. Ed. programme were immensely useful. It was a very successful FCB model.

Case 2: Workshop on Flipped Learning for an Autonomous College in Mumbai

A four-day workshop on Flipped Learning was conducted for Master trainers who were expected to train at least 50 faculty members in a year in the HEIs

in their vicinity. There were 60 participants — 30 from the host institution and 30 were from six other States.

Continuous interaction between the participants was ensured through a WhatsApp Group.

After a year the effect was measured in terms of faculty members trained by the participants of the master trainer workshop, as also their use of ICT tools and blended learning activities.

Several participants from the host institution conducted training for other faculty members. Due to their interest in various areas, many other workshops such as Curriculum Development, Assessment, etc. were conducted. Moodle was introduced as LMS (and also google classroom). Participants started exploring the LMS, which helped in introducing blended learning approach.

The quest for exploring new areas has continued even after three years.

Apart from workplace training, one more important variable was handholding by the resource persons. Shinde and Kamat (2019) have shared their views on this approach.

Case 3: Workshop on Flipped Learning for an Autonomous College in Goa

An autonomous college in Goa conducted a two-day workshop on Flipped Learning for their 29 faculty members from all disciplines (Workplace based TPD model). The author conducted a hands-on workshop on the process of Flipped Learning and how to integrate and use ICT tools such as Padlet for in-class and out-of-class activities.

How the College used Flipped Learning after the workshop:

Process/Method

During class, the faculty delivers lectures and lead activities. students do further enrichment and reinforcement activities independently. This is possible through the college MOODLE LMS wherein through the LMS the students watch videos and other multimedia materials that the faculty uploads before a lecture. Via the materials/resources available the Faculty explains concepts as he or she does during a lecture.

Teachings and Implementation:

- Faculty representatives from each department were introduced to Flipped Learning in a two-day Flipped Learning Workshop conducted in the Centre

for Teaching and Learning by Prof. Vasudha Kamat Former VC, SNDT Women's University, Mumbai.

- The techniques/methods covered were Four Corners, Team-Pair-Solo, Round Robin, Three Step Interview etc. Besides the 4 Pillars of F-L-I-P (Flexible Environment, L: Learning Culture, I: Intentional Content: Professional Educator); how to Flip the class using activities that can be done in-class and out-of-class by cooperative Learning Strategies.
- Interesting ICT tools that can be employed for in-class and out-of-class activities and assessment strategies. Some of the tools taught: Blogs, Padlet, Moodle, Edpuzzle, Polleverywhere, Google Forms, Google drawings, Rubistar, and E-portfolio.
- Each participant identified and implemented a topic in the syllabus using one of the Flipped Learning Strategies that they found was most suitable.
- To facilitate the full process some templates for the Flipped Learning Session Plan were distributed to the faculty, which they duly filed in and followed the implementation.
- Feedback of the implementation was taken up by the Head of the Institution at periodic HOD meetings.
- The Centre for Teaching and Learning (CTL), has some trained faculty who have undergone a week long training on the different methodologies. Therefore, any difficulties encountered were handled at the CTL.

Outcomes:

- The feedback of students indicated that the concepts were well accepted.
- Consequently, there is a move whereby more faculty, papers, and subjects will experiment with this method for the ensuing semesters and academic years.

4. Learning Community Model

Learning Community or Community of Practice (CoP) is an online group of practitioners from a similar field, who have similar concerns about improvement. Faculty members learn from each other and in the process improve their practices.

In the Indian scenario, teachers feel isolated without a support system. There are many experimentative teachers who can inspire and motivate others. Such faculty members, who exchange ideas, share experiences, learning resources, and new developments in the domain, research, or pedagogy fields, are most productive. They develop together and the student population is benefited in the process.

Some such communities already exist (e.g. on curriki.org or merlot.com). MERLOT categorizes communities as:

- Academic Discipline Communities
- Academic Support Communities
- Partner Communities

Such communities can be created online and many platforms are available. The easiest and mostly widely used is the WhatsApp tool. We worked with a group of participants of the workshop on Flipped Learning — 60 faculty members from nine states participated in this face-to-face workshop in 2018, for one year. The functions and achievements, along with handholding by the experts, were presented at PCF9 (Shinde and Kamat, 2019).

There could be more such models of FCB and while experiencing the faster developments in the field of ICT (now Artificial Intelligence is added to the field) one needs to explore more to make the capacity building programmes more effective in helping faculty members perform better.

CAPACITY BUILDING MANAGEMENT SYSTEM

When planning for FCB at the national, state or institutional level, it is advisable to do need assessment as against the teacher standards. Although five-year planning is expected at these levels, implementation can be year-wise. For this purpose, using the Capacity Building Management System (or Teacher Training Management System —TTMS) would be valuable.

Since there are 14 lakh faculty members to be oriented or trained at least every three years, many teacher training programmes have to be planned. It is observed that many TLCs, FDPs and such other centres created under PMMMNMTT are conducting the capacity building programmes in the same area at the same time. Finding resource persons is also a challenge.

The TTMS can keep track of capacity building programmes and planning programmes well in advance, providing freedom and choice to faculty members. Many States have developed TTMS and are using it for teacher training at the school level. Karnataka State Department of Public Instruction has developed TTMS in collaboration with the Azim Premji Foundation, Bangalore.

A similar system can be developed at the MHRD level and shared with States and institutions. The system provides a list of capacity building programmes planned during the year with programme details, names of the coordinator

and resource persons. Faculty members can register for programmes as per their needs and requirement. The system takes care of collecting, collating, analysing all data generated during the workshop, and also creates a certificate. Such a management system would be very helpful at all levels.

EFFECTIVE FACULTY CAPACITY BUILDING — SUGGESTIONS

There are no shortcuts to FCB in the whole system of HE. The following suggestions are for making the system effective and efficient.

1. Develop teacher standards for HE.
2. Plan for Technology Integrated Capacity Building Programme (Blended Learning) rather than face-to-face mode. This will enable a quick move to the online model.
3. Design and develop Capacity Building Management System and use it.
4. Develop MOOCs that provide for interactivity among participants.
5. Create a platform for interaction of participants with resource persons. First train the resource persons (domain experts) in 21st-century pedagogy and integration of ICT into teaching-learning-assessment processes.
6. Orient resource persons on outcome based learning process.
7. DNEP-2019 has suggested a big role for the departments of education in universities. Traditionally, these departments only offer M. Ed. (and/or MA in Education) and PhD programmes in Education. DNEP suggests that these departments should take responsibility of training faculty members from different disciplines (such as engineering, pharmacy, nursing, and social science) in pedagogy, assessment strategies as well as integration of ICTs.
8. TLC in each university: Out of the 993 universities there are 46 Central Universities, 371 State Public Universities, 127 Institution of National Importance, 44 Govt. or Govt.-aided Deemed Universities and 15 open universities (14 at State and 1 National). Total number of Government or aided universities is 608. Only 385 are private State or deemed universities (AISHE 2019). TLCs can be in all these 608 universities with a responsibility of FCB from their own departments as well as their affiliated colleges.

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LIFE SKILLS

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INTRODUCTION

In the 21st century, education is undergoing a revolutionized change vis-a-vis science and technology, globalization, privatization, urbanization, industrialization, among other fields. Today's youth is facing many emerging issues such as global warming, famines, poverty, population explosion as along with social, emotional, physical, and psychological issues. Cut-throat competition, unemployment, and lack of job security, are some of the major concerns for the educated and as a result, they are caught in an unrelenting rat race. No one has time for his or her 'self'; no opportunity to reflect or introspect, and thus develop empathy with the surrounding and to have harmony in society.

Young minds, with their physical energy and intellectual capability, are supposed to be the most productive members of society. But in the real scenario, most of them are unable to utilize their potential appropriately due to the lack of guidance and motivation. Social problems, such as alcoholism, drug abuse, sexual abuse, smoking, juvenile delinquency, and anti-social acts with their off-shoots of depression, anxiety, and stress, which even lead to suicidal tendencies, have an adverse effect on everyone.

This challenge requires an immediate and effective response from a socially-responsible system of education. Education, now-a-days is undoubtedly very important, but a holistic education system, that supports and motivates positivity in life is more important. The cardinal focus of education, therefore, needs extraordinary emphasis on developing such skills in students, which are important building blocks for instilling the dynamism to cope with future challenges and survive. These are considered as Life Skills. Life skills are the means to empower young minds in demanding situations in personal, professional, and social life.

According to the Delors Commission (1996)[1], instead of continued economic growth, humanity's further progress depends on an increase in a broader "personal development" and empowerment that allows people to steer overall development in a sensible way. Imparting a life skill among students is the best way which leads to holistic development.

DEFINITION OF LIFE SKILLS

To better understand the term 'Life Skills' it is helpful to investigate its origin. In the 1986 Ottawa Charter for Health Promotion, it was stated under the

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rubric of personal skills that health promotion supports personal and social development by providing information, education for health and enhancing life skills. By doing so, it increases the options available to people to exercise more control over their health and environments, and to make choices conducive to improved health. This links life skills with responsible personal decision-making and the capacity to make appropriate behavioural choices for a healthier life.

There are many different understandings of life skills but no definition is universally accepted. The International Bureau of Education (IBE) derives its understanding from the "Delors' Four Pillars of Learning" and defines them as personnel management and social skills necessary for adequate functioning on an independent basis:

- learning to know
- learning to do
- learning to be
- learning to live together.

DEFINITION OF LIFE SKILLS BY INTERNATIONAL ORGANIZATIONS

United Nations Children's Fund (UNICEF): defines life skills as: "A behaviour change or behaviour development approach designed to address a balance of three areas: knowledge, attitude, and skills." Life skills are psychosocial and interpersonal skills, which are generally considered important, referring to a large group of psychosocial and interpersonal skills that can help people make informed decisions, communicate effectively, and develop copying and self-management skills that may help them lead a healthy and productive life.

The Organization for Economic Cooperation and Development (OECD): has adopted a more generic definition of life skills. It defines three general criteria:

1. Key competencies contribute to an overall successful life and a well-functioning society.
2. They are instrumental to meeting important challenges in a wide spectrum of relevant contexts.
3. They are relevant to all individuals.

As mentioned in (1), these key competencies are functioning in socially heterogeneous groups, acting autonomously and using tools interactively.

World Health Organization (WHO): states life skills are, "The abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life." 'Adaptive' means that a person is flexible in approach and is able to adjust in different circumstances. "Positive behaviour" implies that a person is forward looking and even in difficult situations, can find a ray of hope and opportunities to find solutions.

The ten core life skills as laid down by WHO:

1. Self-awareness
2. Empathy
3. Critical thinking
4. Creative thinking
5. Decision making
6. Problem solving
7. Effective communication
8. Interpersonal relationship
9. Coping with stress
10. Coping with emotions

6. Let us understand all the listed skills in details.

1. Self-awareness

Self-awareness is the thinking skill that focuses on a child's ability to accurately judge his or her personal performance, behaviour, and to respond appropriately to different social situations. Self-awareness helps individuals to tune into their feelings, as well as to the behaviours and feelings of others. As per ancient Bharatiya (Indian) scriptures it is "know thyself" and Bharatiya philosophy reiterates it as अहम् ब्रह्मास्मि meaning I am the Absolute; it also implies the absence of the individual ego.

2. Empathy

Empathy is the ability to experience the thoughts, emotions, and direct experiences of others even if they have not been directly communicated. Empathy goes far beyond sympathy, which might be considered "feeling for" someone. Empathy is "feeling with" someone, putting oneself in another's shoes, so to say, using intuition and imagination.

3. Critical thinking

The ability to think in an organized and rational manner to understand connections between ideas and/or facts, is critical thinking. It helps one decide what to believe in. In other words, it's "thinking about thinking" — identifying, analysing, and then fixing the flaws in the way we think. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective

4. Creative thinking

An invaluable skill for students, creative thinking helps to look at problems and situations from a fresh perspective. It is a way to develop novel or unorthodox solutions that do not depend wholly on past or current solutions. it means employing strategies to clear a mind so that thoughts and ideas can transcend what appear to be the limitations of a problem. Creative thinking is a way of moving beyond barriers. As a creative thinker one should be curious, optimistic, and imaginative.

5. Decision making

Decision making is choosing between two or more courses of action. In a wider process of problem solving, decision making involves choosing between possible solutions to a problem. Decision making is a logical and scientific process.

6. Problem solving

A problem is any unpleasant situation, which prevents people from achieving what they want. Any activity to eliminate a problem is, "problem solving". Problem-solving skills refers to our ability to solve problems in an effective and timely manner, without any impediments. It involves being able to identify and define the problem, generating alternative solutions, evaluating and selecting the best alternative, and implementing the selected solution. Obtaining a feedback and responding to it appropriately is an essential aspect of problem-solving skills.

7. Effective communication

Effective communication skills include verbal and non-verbal communication, active listening, the ability to express feelings, and give feedback. Included in this category, are negotiation/refusal skills and assertiveness skills that directly affect the ability to manage conflict. These skills set enable acceptance in society, the acceptance of social norms that provide the foundation for mature social behaviour.

8. Interpersonal relationship

Interpersonal relationship skills help to relate positively with people when interacting with them. This may imply the ability to make and maintain friendly relationships, which are of great importance to mental and social well-being. As an example, good relations within a family are a social support.

9. Coping with stress

Stress or distress is caused by the excessive demands placed on physical or mental energy. Stress often affects behaviour; therefore, the stress in one person is likely to put stress on others, whether family, friends, or colleagues. Coping with stress implies conscious effort and energy to solve personal and interpersonal problems. Coping mechanisms seek to master, minimize, or tolerate stress and stressors that occur in everyday life. These mechanisms are called coping skills or coping strategies.

10. Coping with emotions

Coping with emotions is the capability of speaking out or expressing feelings. It is a life skill that ensures a healthy and prosperous life. Coping with emotions includes: understanding the impact of emotions on perception; realizing the effect of emotions on behaviour; assessing its influence on others; and understanding the role of physiological or bodily changes behind emotions.

LIFE SKILLS AS PER ANCIENT BHARATIYA (INDIAN) WISDOM

Different life skills like empathy, decision-making techniques, critical thinking, creative thinking, and effective communication are all discussed in various ancient Bharatiya literatures such as the Vedas, Upanishads, the Bhagavad Gita, the epics Ramayana and Mahabharata (which includes the Bhagavad Gita in it), the Puranas, and Kautilya's Arthashastra. These literatures provide detailed information about the importance of life skills and their role in a person's life.

In the *Taitriya Upanishad* the chapter on *Shikshavalli* (which means education and instruction) focuses on the *Pancha Kosha* development (the five layers of the body that lead to the Soul). The development of all these *Kosha*s results in the development of all life skills and ultimately leads to the holistic development of a human being.

- Annamaya Kosha (physical development): This reflects on physical health; a healthy body leads to a healthy mind and that impacts the values in an educational environment. Wholesome food in appropriate quantity at the correct time; proper physical activity and rest, and good positive thoughts are the three tools for a healthy body. Select the right nourishment; eat at the opportune time, in the appropriate quantity; and with positive thinking is the recipe for holistic growth. Similarly significant is the focus on adequate physical activity and rest.

- Pranamaya Kosha (vital development): This layer refers to the vital principle or force that vitalizes and holds the body and the mind together. It's one physical manifestation is the breath. The importance of yoga, pranayama, meditation, and attention being focused on maintaining the balance on the body and mind cannot be over-emphasized here.
- Manomaya Kosha (mental development): The layer of the mind, it is the field of mental energy. This is the layer where control of the mind, focused concentration, and not being a victim of uncontrolled or automatic thoughts is important. Introspection and reflection are the vital skills.
- Vigyanmaya Kosha (intellectual development): In direct link with the mind is the intellect, literally the layer where the human wisdom resides. Friendship, trust, empathy, discrimination, and discipline emanate from this level of the human mind-body complex.
- Anandmaya Kosha (spiritual development): the layer made of bliss (ananda) is in Vedantic philosophy the most subtle or spiritual of the five levels of embodied self. For an individual to be in equilibrium, it is important for the psychophysical system to be in sync. That alone can ensure creativity, peace, and harmony, the essentials to a completely balanced human being.

In the Ramayana, prince Rama demonstrates excellent examples of the cultivation of life skills. The statement, "*Prana jayi par Vachan na jayi*" (One can give up one's life but not go back on one's word) reflects the epitome of a determined decision maker and excellent communicator. The Mahabharata is an encyclopaedia of different life skills. It includes illuminating insights on values, ethics, creativity, decision making, critical thinking, problem solving, path making, visionary mentorship, and interpersonal relationships interestingly juxtaposed with indecision, faltering, dullness, compromise, deceit, and complicity.

In chapter 16, verses 1 to 3, of the Bhagavad Gita, Sri Krishna outlines 26 qualities of a gentleman. Among them are: merciful, obedient, truthful, equitable, saintly, magnanimous, mild-mannered, clean, simple, charitable, peaceful, sober, respectful, humble, grave, compassionate, friendly, eloquent, and precise. It shows the importance of life skills.

Vidur niti (the wisdom of the wise minister Vidura in the Mahabharata) throws light on communication skills by saying — Sweet words are more important than costly gifts in breaking the ice.

Chanakya, also known as Kautilya says, "शास्त्र पूतं वदेय वाक्यम्" (Speak what is sanctified by literature). He also emphasizes on empathy and says, "दानं धमर्रू । दया धर्मस्य जन्मभूमि।" (Giving or charity is dharma. Empathy is the birth place of dharma.)

The ancient *gurukula* system, where the *shishya*s (students) lived with the guru in his hermitage, was the best for imparting life skills. The *shishya*s, were taught in a natural surrounding where they lived in the spirit of brotherhood, love, and discipline. The essential teachings were in subjects such as, language, science, mathematics, through group discussions, brain storming, and self-learning. Focused attention was given to arts, sports, crafts, and singing, that developed intelligence and critical-thinking skills. Activities such as yoga, meditation, and mantra chanting generated positivity, humanity, and peace of mind. It was mandatory for the *shishya*s to perform all personal daily chores to teach practical skills and inspire overall personality development and increased their confidence, sense of discipline, intellect, and mindfulness, which was very helpful in imparting all life skills.

IMPORTANCE OF LIFE SKILLS

With changing technology and the increasing pace of modern life, students are already struggling with balancing their thoughts, perspectives, and lives. Life skills are the capabilities of dealing with these challenges with a positive attitude and conquering them efficiently. Life skills must be included in the curriculum so that students learn them and excel. The aim has to be improving the social, thinking, and emotional skills of students.

Social skills: Teamwork, mutual respect, communication, and stress management are very important to meet the challenges and to be successful. Social skills train students to blend well in society. This includes proper communication skills and building better and strong relations; developing an understanding of people; being empathetic; upholding moral values, and being helpful. Students have to be aware of their status and importance to the society and of their responsibilities as citizens of our nation.

Thinking skills: Each individual has a unique way of dealing with situations. Thinking skills helps students to cope with challenges. Problem solving and decision making are key concepts of thinking skills. Students must know how to deal with their difficulties and make right decisions to solve their problems. Thinking out of the box is very important to stand out in the crowd. Creative and practical ways of thinking are encouraged.

Emotional skills: The ability to control emotions comes under emotional skills. Each human being expresses and deals with emotions and feelings differently. An Academic Institute should focus on helping students with stress management and coping with their emotions.

Multiple life skills or a combination thereof are required to effectively manage any situation. They are integral to a being's life. Life skills work best in conjunction. The ideal combination of life skills at any given moment is an art in itself.

Life skills are first and foremost imbibed from parents, then from teachers and others who act as role models. One learns from one's own experiences also. It is said that experience is a best teacher, and the worst experiences teach the best lessons! Students gradually learn to effectively use particular skills in diverse situations to cope with the challenges of life. In this age of rapid growth it's very important to impart life skills through formal education system. Teaching life skills also strengthens the bond between teachers and students. Students develop a positive attitude towards themselves and their colleagues. Along with knowledge and learning, students are taught to deal with real-life problems, hence helping them develop to their full potential. This results in self-motivation and confidence building. Students learn to create a healthy environment and motivate those who are around them.

Education on life skills creates a strong, positive, powered force of citizens who in the coming future will contribute to the society. It facilitates character building and preserves the values of society. It is the most powerful tool for the holistic development of a person.

DIFFERENT TYPES OF LIFE SKILLS

Life skills can be divided into four parts.

1. Communication Skills
2. Professional Skills
3. Leadership Skills
4. Universal Human Values

We discuss here these parts of life skills in detail.

1. Communication Skills

Communicating effectively is perhaps the most important of all life skills. Communication enables us to pass information to other people, and to

understand what is said to us. It is the act of transferring information from one place to another. It may be vocal (the spoken word, the voice), written (using printed or digital media such as books, magazines, websites, or emails), visual (using logos, maps, charts, or graphs), or non-verbal (using body language, gestures and the tone and pitch of voice). In practice, it is often a combination of several of these. According to the Oxford English Dictionary, communication means the imparting or exchange of information by speaking, writing, or using some other medium.

Categories of Communication

There is a wide range of ways in which we communicate and more than one may be occurring at any given time. The different categories of communication include:

- *Spoken or verbal communication*: Communication is a two-way process. Verbal communication therefore requires a speaker to transmit the message, and a listener to make sense of the message. This includes face-to-face interaction, telephone, radio, or television and other media.
- *Non-verbal communication*: This covers body language, gestures, how we dress or act, where we stand, and even our scent. There are many subtle ways that we communicate (perhaps even unintentionally) with others. For example, the tone of voice can give clues to moods or emotional states, whilst hand signals or gestures can add to a spoken message.
- *Written communication*: It includes letters, e-mails, social media, books, magazines, the Internet, and other media. Until recent times, a relatively small number of writers and publishers were very powerful when it came to communicating the written word. Today, we can all write and publish our ideas online, which have led to an explosion of information and communication possibilities. It also includes social media communication, blog, and websites.
- *Visualizations:* graphs and charts, maps, logos and other visualizations can all communicate messages.

There are three important component of the communication process: sender, receiver, and a message. The sender and receiver are communicators. A good communicator must be an active and empathetic listener, a rational interpreter, an open-minded and positive thinker, confident, and likable. The message should be clear, concise, simple, and specific. The concept of good communication is different as per the Bharatiya Shastras (ancient Indian scriptures): "सत्यं वद। धर्मं चर" (speak the truth, abide by your dharma).

2. Professional Skills

An individual must be able to demonstrate professional skills involving the use of intuitive, logical, and critical thinking, communication, and interpersonal skills, not limited to cognitive or creative skills. These skills, behaviours, and quality of output enhance employability.

Career skills empower an individual with the ability in preparing an appropriate resume, addressing the necessary gaps for facing interviews, and actively and effectively participating in group discussions. It is significantly importance that students have the know-how to explore career opportunities for themselves, evaluating their innate strengths and weaknesses.

Professional skills can be divided into two parts: career skills and team-building skills.

a) *Career Skills*: One of the significant outcomes of higher education is to prepare an individual for entering the job or employment market. Besides the knowledge and skills required for a particular job or occupation, a person requires professional skills to be gainfully employed for a successful and satisfied life. Career skill is important for the purpose of employment. It covers basic skills such as: resume writing, interviews, group discussion, presentation, decision making, logical and critical thinking. These skills can be imparted and improved through proper training and education. Career skills also include "know yourself". This is related to self-awareness. If a person chooses a job that suits his or her personality, then that is best career choice. That is why Confucius once said, "Choose a job you love, and you will never have to work a day in your life."

b) *Team-building Skills*: It is important to be well prepared to take on new challenges and opportunities. With the increasing use of technology in the way we live, learn, and work, it is critical to be able to utilize basic computing concepts and also have excellent team skills. Collaborating and working together can help in resolving complex problems, which allow or offer the opportunity to articulate new ideas and perspectives. This further allows individuals to design, develop, solve problems, and adapt to situations based on their experience and skills.

As given in the *Rig Veda*: ÞlaxPN/oa laon/oa la oks eukafl tkurkEß, "may you move in harmony, speak in one voice". It emphasizes the importance of team building through harmony and good communication. It also emphasizes attaining a desired goal through teamwork. Social and cultural etiquettes, trust, and internal communication play very important roles in team building.

3. Leadership and Management Skills

Nelson Mandela once said, "It is better to lead from behind and to put others in front, especially when you celebrate victory when nice things occur. You take the front line when there is danger. Then people will appreciate your leadership." Leaders are the foundations of society, who face and win against the adversities and odds of life. Through their words and deeds, leaders show the path to others and help them to transform into inspirational role models, making a huge difference to social life. The leadership skill is a set of so many skills merged together, such as motivation, team building, negotiation, networking, coordination, and design thinking. Management and leadership are important for achieving any goal. Although the two are similar in some respects, they may involve different types of outlook, skills, and behaviours. Good managers have to strive to be good leaders, and good leaders need management skills to be effective. Leaders have a vision of what can be achieved; they communicate this to others and evolve strategies for realizing the vision. They motivate people and are able to negotiate for resources and other supports to achieve their goals. Managers ensure that the available resources are well organized and applied to produce the best results. Leaders have a sense of mission, are charismatic, and are able to influence people to work together for a common cause. They are decisive and use creative problem solving to ensure better care and a positive work environment.

4. Universal Human Values

Truth, love, peace, non-violence, and righteous conduct are the universal human values. Renunciation (sacrifice), compassion, and service are also commonly acceptable human values, which at the operation level have been named differently as sincerity, honesty, righteousness, humility, gratitude, aspiration, prosperity, non-violence, trust, faith, forgiveness, mercy, peace, and so on. These are needed for the well-being of an individual, society, and humanity and ultimately, for peace in the world. To impart education of human values the character of a teacher is very important. "Act what you speak" is the best principle for it. Maharshi Arvind (Sri Aurobindo) said, "Perfect health, sincerity, honesty, straightforwardness, courage, disinterestedness, unselfishness, patience, endurance, perseverance, peace, calm, self-control are all things that are taught infinitely better by example than by beautiful speeches."

In this era of cut-throat competition, moral and religious values are being undermined. The fundamental principles of civilization are being ignored.

Conflicts of ideas, manners, and habits are pervading the atmosphere. Disregard for everything old is the fashion of the day. In this scenario, the solution of all these social and global evils is through value education. Emphasis must be laid on such education through which moral values can be developed among the students so that they can conduct their lives morally. They can discern the difference between: right and wrong, good and evil, justice and injustice. To ensure that a student is a good human being, the primary task of education is to develop universal human values in him. These are the foundation of human existence. The universal message of all the ancient Indian scriptures is to focus on universal human values. To impart these values to students we must include the study of such scriptures in the curriculum.

IMPARTING LIFE SKILLS IN COLLEGES, UNIVERSITIES

As Swami Vivekananda has said, "Education is the manifestation of the perfection already in man." Education means all-round development of a person. Life-skill education is a part of it. It provides the opportunity for the overall development of a student. With the help of simple activities, as described here, life skills can be taught to students:

***Classroom discussions*:** Bharatiya culture developed on two basic principles: "मुंडे मुंडेरू मतिरू भिन्ना": Every mind thinks differently, and "वादे वादे जायते तत्व बोध": By discussion substance emerges. Teacher should follow these two pithy sayings and invite students to free and fair discussion on any subject. This activity provides opportunities for students to learn and practice, turning to one another in solving problems. It enables students to deepen their understanding of a topic and personalize their connection to it. It develops thinking skills, listening, assertiveness, and empathy.

***Brainstorming*:** The Bhagavad Gita says "श्रद्धावान् लभते ज्ञानं तत्परू संयतेन्द्रिय": Those whose faith is deep and who have practiced controlling their mind and senses attain divine knowledge. This suggests that one must have faith in one's idea. Brainstorming allows students to generate ideas quickly and spontaneously. It helps students to use their imagination and think out of the box. Good discussions lead to innovations. At the end of the activity, students can creatively generate ideas. It is essential to evaluate the pros and cons of each idea or rank ideas according to certain criteria.

***Role plays*:** Along with being a fun activity that involves the whole class to be active and participative, role playing also provides an excellent strategy for practicing skills; experiencing how one might handle a potential situation in

real life; increasing empathy for others and their points of view; and increasing insight into one's feelings.

***Groups*:** Groups are helpful when time is limited as it maximizes student input. Allows students to interact, and know one another better, which in a way, enhances team building and team work.

***Educational games and simulations*:** These promote fun, active learning, and rich discussion, as participants work hard to prove their points or earn points. They require the combined use of knowledge, attitudes, and skills and allow the players to test out assumptions and abilities in a relatively safe environment.

Analysis of situations and case studies: This activity gives a chance, to analyse, and explore the challenges and dilemmas, and safely test solutions for providing opportunities for working together in groups, sharing ideas, new learning, give insight, and promote the ability to see things differently.

Case studies are powerful catalysts for thought and discussion. Engaging in this thinking process, students improve their own, critical thinking, and decision-making skills. It also gives the chance to confront challenges and find ways to cope with them.

Sports: *Annamaya Kosha* (physical development) is the first and outermost stage of holistic development. Games and sports are best forms of recreation besides developing life skills; their impact on the temperament and outlook of the players is immense. They help in sublimation of the personalities of players. Training in physical education develops a high sense of obedience and discipline. Sports develop the spirit of sportsmanship, which leads to universal human values. Trainings such as the National Cadet Corp (NCC), National Service Scheme (NSS), scouting, guiding, mountaineering, and trekking train individuals in teamwork, self-discipline, courage, bravery, obedience, integrity, friendship, service, and respect for labour.

Yoga and meditation: Dr. Sarvepalli Radhakrishnan had said, "There should be silent prayer in every university." This should be religiously followed in practice. Meditation and yoga can contribute directly to improving focus and concentration among students. Yoga combines focused and regularized breathing for the coordination of mental concentration, strength and flexibility exercises, with relaxation and meditation. Studies have revealed that yoga has helped cure a wide range of mental and physical health problems. The most important concept that yoga tries to instill in students is mindfulness. It helps students to pay focused attention to the work they are doing at any given

point of time. This mindfulness helps students to build a serene environment around them and also develop good interaction with parents, friends, teachers, and others. A balanced mind ensures a good thinker, decision maker, problem solver, and effective communicator. It is the best manager of stress.

Co-curricular activities: Co-curricular activities have to be planned from the point of view imparting life skills and value-orientation. Literary and cultural activities such as poetry recitation, declamation and debate, symposium, essay competition, drama, mono-dance, music, painting competition, and group dancing, help students to learn leadership, self-discipline, cooperation, and a healthy attitude towards competition, celebration of winning and losing, and emotional control.

***Art activities*:** With some overlap with co-curricular activities perhaps, dance, drama, music, painting, clay moulding, sculpture, and mixed-media arts, are generally classified under the performing and visual arts, and are most essential for the all-round development of the personality of a student. This implies the development of a student as a person, learner, and citizen. The process of creativity provides the opportunities for self-learning, expression, exploration, and creation.

CONCLUSION

Life skills can be taught to young people as abilities that they can acquire through learning and practice. Inevitably, cultural and social factors will determine the exact nature of life skills. The exact content of Life Skill Education must be determined at the local level. In learning life skills many factors can affect a student. The environment, aura, and ambience of a campus are some of them. Life skill education, therefore, may be the same but the results will be different, going from person to person. It is also understood that life skills cannot be taught through formal education only. But formal education would be the basis for developing the skills among students. Developing life skill in students is a process, which leads to character building and overall personality development.

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EVALUATION REFORMS IN HIGHER EDUCATION

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INTRODUCTION

It is a well-known fact that the economic success of a country is determined by the prevalent education system. From being an agrarian economy in the past, India has made rapid progress and is well poised to being a knowledge economy. The country is witnessing accelerated growth in terms of an expanding society and development in key industrial sectors (British Council, 2014). The country thus needs skilled human resources to keep up this momentum of progress. With a huge proportion of population in the young age bracket (currently about 50 per cent of the population is under 25 years old), there exist tremendous opportunities of growth for the higher education sector. Although there are many universities and institutions for higher education in India, these may be insufficient to meet the growing requirements. The Government has taken initiatives to ensure a continuous stream of skilled graduates to contribute towards economic development and as a result, has effectively transformed its higher education landscape by creating greater access to quality university education. In 2018, the University Grants Commission (UGC) set the objectives of quality mandate for improving the quality of Higher Educational Institutions (HEIs) in India.[1] Some of the key areas of focus include: to improve the graduate outcomes so that students become more employable or self-employable; build linkages between students and the society or industry to ensure that students engage in or undertake socially-productive activities or projects; the HEIs must train students on essential professional skills, soft skills, inculcate entrepreneurial ability, spirit of innovation, and critical thinking.

The Higher Education System (HES) in India is one of the largest in the world and is poised to be a major hub for education.[2] The framework of higher education in India includes various types of institutions, including universities, institutes of national importance, and colleges. The main types of universities are: Institutions established by an Act of Parliament, Central universities, State universities, Deemed universities, and private universities. There has been tremendous growth recently, in the number of institutions — both universities and colleges. Many private institutions have also contributed to the growth. The higher education landscape has been transformed by the widespread access to education for students at all levels. With a student-centric education

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model and expansion, the higher education sector has higher gross enrolment ratios as compared to the past. With a federal setup of higher education, the Government of India places education as a joint responsibility of the centre and states. The main regulatory bodies that are responsible to regulate higher education in India are the UGC and various other central/federal councils.

Broadly, the system of higher education in India is of an affiliating nature wherein the bulk of students study at public or private colleges that are affiliated to a state-run university. These affiliated colleges conduct recognized programmes of the university in various disciplines after these are approved by respective councils. These affiliated colleges deliver the curricula and examinations as specified and regulated by the respective State universities. The quality of higher education is ensured with the help of accreditation agencies such as National Assessment and Accreditation Council (NAAC), an autonomous institution established by UGC and the National Board of Accreditation (NBA), which was initially established by the All India Council for Technical Education (AICTE) and is now an autonomous/independent body.[3]

The higher education sector has had challenges[4] with the reluctance to upgrade, very large number of students, and lack of proper facilities, all of which have resulted in colleges becoming mass teaching centres, that generally seem to lack:

- adequate research and development,
- good quality teaching professionals, and
- sufficient infrastructural and academic facilities comprising laboratories and libraries.[5]

The lack of interest among students is another cause of concern, as it appears that many students are only interested in acquiring a degree and therefore show no urge for learning and applying that knowledge. The focus is on rote learning, memorizing, and taking examinations; consequently, some students may resort to cheating during examinations.

Initially the affiliation system worked well as there were fewer affiliated colleges. But as the number of students and colleges grew, the affiliating university faced difficulties in terms of maintaining the requisite quality of education (Sharma, *et al.*, 2013). This rapidly increase in the number of colleges caused hurdles in the effective functioning of the HES. The large affiliation system hinders

regular monitoring of academic performances of colleges and that affects quality.[6] Due to large numbers of students, teachers are under tremendous pressure and face difficulty in assessment and evaluation, which leads to decline in the academic standards. The large affiliation system has rendered state universities as mere examination-conducting bodies thus limiting research and other innovation-based activities. Additionally, the teachers are burdened with other administrative work such as, being assigned inspection work at affiliated colleges, which hinders their focused contribution to the academic development. The report on "Issues and challenges before the higher education sector in India", by the Standing Committee on Human Resource Development in 2017 highlighted some issues:

- Shortage of resources at state universities who have large number of students through the affiliation system and less funding, thus impacting quality of education.
- No mechanism exists to ensure accountability and performance of teachers.
- Lack of employability skills in students.

The public universities in India need reforms as they suffer from a lack of resources and infrastructure.[7]

There is a lack of quality research work because of limited focus on research and its global implications. Connectivity of HEIs to research centres is essential as both teachers and students need to be actively involved in creating new knowledge. Research has to be conducted while maintaining a standard and quality so as to translate original and new contributions to the body of knowledge. Ensuring quality in all processes and activities of HEIs has always been a key challenge and therefore many institutions are not able to meet the minimum requirements as specified by the regulatory bodies (Sharma, 2015). The focus has to be on improving quality of teaching and learning through systemic changes, especially at affiliated institutions. Due to the lack of quality in teaching and learning, there is a huge gap between the students from India and those from other countries who have ensured qualitative enhancements in higher education. In India, qualitative enhancements have not kept pace with quantitative expansion. The quality of curriculum also needs serious thought as the danger of irrelevance always lurks in universities and institutions. There is very low industry engagement in curriculum and skill development, thus lowering the quality of education imparted. The existing curriculum needs a shift of focus:

- Become student-centred instead of subject-centred.
- Meet the students' learning requirements and aspirations, beyond providing theoretical knowledge.
- Address the challenges faced by the educated youth regarding unemployment.
- Take proper steps to harness the skills and abilities of the educated youth to transform them into sought-after assets rather than be considered liabilities.

Of key concern is the mode of evaluation, which may have not focused on the depth of information required in a chosen area instead of the volume of information.

EXISTING EVALUATION SYSTEM

In India, the HES has so far been largely examination-oriented because examinations constitute a dominant dimension of the system.

Limitations of the current examination-oriented system:

- It is rigid and tests rote learning rather than focusing on broader skills or deeper learning based on cognitive abilities.
- In most cases, the examination system is affiliating in nature with external, final university-conducted examination at the end of every semester or every year. This, solely serves the purpose of limited assessment.
- The efforts of teachers covering various topics and the learning efforts that students invest, both aim at attaining good results.
- The pattern of annual examinations, or end-of-term examinations, has prevailed since a long time, testing students with focus on marks attained, percentages and divisions.
- Final examinations are a standard or decider of the fate of millions of students.
- The end-of-term examinations, in many cases, are for three hours each and that is the sole tool to decide the future career of students.
- The question papers tests only memory recall as a skill.
- The term-end examination based on a question paper creates flaws of the numerical nature of assessment (majority of marks are dependent on performance at the term-end examination).

- It leads to insensitive cramming of superficial discreet information.
- Examinations, which should always be looked as a means of enabling students, tend to disable them.
- Some students are unable to fare well under such circumstances, despite having worked consistently through the entire term.
- This system, more often than not, insulates students from the quest for knowledge, excitement of discovery, and the joy of learning.
- There is very little focus on continuous assessment during the teaching-learning process.
- All teaching and teaching pedagogy concentrates on preparing students to work towards getting better marks and memorizing the topics for the short-term.
- This system affects the standard of teaching and learning because it is attuned to emphasis on eliciting factual information.

Limitations within the machinery:

- The machinery of conducting end-of-term examinations exerts tremendous pressure on affiliating universities due to the large number of examinees.
- The pattern and design of the question paper is decided by the Board of Studies for each subject, and is responsible to appoint paper setters and evaluators.
- . The term-end examination are based on question papers that majorly test memory recall as a skill.
- The examination department of a university requires question papers continuously, which creates possibilities of compromising the quality of question papers thus set, due to the constant requirement.
- The question papers that are set have to be printed and sent to various examination centres, which are spread across huge distances. This requires huge logistics support to ensure that examinations are conducted simultaneously and punctually.
- The answer scripts of the students are then transported to designated centralized assessment centres.
- The marks of each subject received from the designated evaluation centres have to be integrated into the mark-sheet of each individual student; this requires accuracy and speed to ensure the timely declaration of results. This raises the question of quality assessment.

In several instances, the university-certified degree holders of UG, PG or PhD are made to take another written examination before they are accepted for jobs in public or private sectors. Thus, students enrolled under the HES are not coming out with the desired level of knowledge and expertise.

NEED FOR REFORMS IN THE EVALUATION SYSTEM

An effective education system relies on the integrity and efficacy of the existing evaluation system. Unless evaluations are designed to be the best identifiers of the performance of students; students won't put in their best efforts in learning and understanding concepts.

In India, evaluations play a pivotal role in the career choices made by students; in the pursuit of higher qualifications by students; and in the determination of the degree of knowledge possessed. The global competitive forces and the wave of disruptions in industry have brought in sweeping changes, both in terms of skill requirement and the decision-making capabilities of human resource, thereby exerting tremendous pressure to perform in complex situations. As already discussed, the assessment of students in the existing university system is a matter of concern. The current examination system tests memory learning skills. Demands from profession require students to not just have information but the ability of individual application to every situation, whether routine or complex. This necessitates that students perform to the best of their capabilities. Memory learning is certainly required but it is not adequate to performs in the current challenging environment. There is necessary to assess students' application skills or skills of higher ability such as, analysis, creation, and evaluation .

Standardization of assessment has its flaws as every student differs in terms of intellect and ability and as such, one tool of measurement is akin to "one size fits all", which fails to identify individual abilities and potential of students. Evaluations, in its current form translate into stress and anxiety for students, both at the pre-examination and post-examination stages. Additionally, there are issues of malpractices, which question their credibility.

In the present age of digitization, design thinking, automation, and artificial intelligence, it is necessary to move from the traditional memory-testing, marks-based system to the much-required experiment and hands-on learning system that raises the levels of curiosity and excitement in the pursuit of knowledge. Students require efficient problem-solving skills so as to make them more industry-ready; for that they have to undertake more project-based

and practical-based learning instead of the traditional learning practices. Institutions need aptitude-based mechanisms to nurture creativity and creative thinking in students. The new systems of evaluation must be designed to assess talent and scientific temperament.

A re-modelled or effective evaluation system would:

- make evaluations more suitable to measure the performance of students;
- lead to the use of more transparent methods and instill confidence in the students about the efficacy and objectivity of the system;
- ensure a holistic outcome instead of an evaluation by marks, which is of prior importance to students
- ensure credibility and the outcome of the assessment system.

There is a need to have more horizontal assessment modes instead of the one single vertical mode that decides the fate of students. Reforms in evaluation for all forms of education, that is, formal face-to-face mode, open-and-distance-learning mode, should aim at the overall development of students in terms of their critical thinking, problem-solving ability, right application of knowledge, and adherence to ethics.

Learning outcome-based performance assessments needs focus in order to assess 21st-century skills and domain-specific competencies (British Psychological Society, 2019). Broader insights are required to implement performance assessments and to teach relevant skills. Performance assessments may be used to generate evidence as to whether students can apply knowledge and skills in a broad range of situations and settings (Braun, 2019).

To ensure evaluation that is more student-oriented than examination-oriented, outcome-based education is an important alternative and HEIs may need to implement this as early as possible.

OUTCOME-BASED EDUCATION (OBE)

In gearing up students with the requisite skills demanded by professions, there have been efforts made to design an education system that moves towards being student-oriented from the traditional teacher-oriented. The education reforms are triggered with the need for accountability and accreditation of the education system. Thus attention is focused on students' learning outcomes and aligning teaching and assessment with the intended learning outcomes.

What is OBE?

Spady and Marshall (1991) defines OBE as the means of focusing and organizing everything in an educational institute that is essential for students to perform successfully at the end of their learning experience. Some important elements that serve as procedures and steps must be undertaken by educational institutions for the effective implementation of the system. OBE directs each part of an educational system around goals (outcomes). By the end of the academic period, each student should have achieved the goal. The concept of OBE stresses the importance on demonstration of learning outcomes by students rather than just attaining marks in the examination. It entails the need to align all educational processes and systems to the expected outcomes that students should be able to demonstrate at the end of the teaching and learning activity. OBE starts with the clear statement of what knowledge, skills, and attitude the graduate will be able to demonstrate in a clearly measurable way, as having acquired on the successful completion of the programme. OBE rests upon clear statements of vision and mission, which form the basis. All outcomes and consideration of the programme's educational objectives should stem from the vision and mission statements.[8]

Spady listed some ground principles (Killen, 2000) that characterize OBE:

- *Clarity of focus*: the learning outcome has to be made obvious to the learner at the beginning of the course (teachers must be clearly focused on what they want the students to know, understand and be able to do).
- *Design down – Deliver up*: designing of curriculum with a clear definition outlining the expected outcomes so that all instructional decisions are made to achieve the end result and that teachers teach what students need to learn to demonstrate the outcome.
- *High expectations*: teachers need to establish high standards of performance so as to encourage and motivate the students to be engaged deeply in what they are doing and learning. Students have to be made to believe that they can deliver high levels of performance.
- *Expanded opportunities*: it means opportunities must be provided to students to demonstrate their learning in different ways as not all learners learn the same thing, in the same way, and at the same time.

The OBE approach helps: to focus on the utilization of appropriate instruction and pedagogy; organize teaching and learning processes around career advancement and placement of students; select and design appropriate

assessment modes; and ensure that programmes are awarded based on demonstrated achievement of outcomes.[9] The main advantage of OBE is that it creates a clear expectation of what needs to be accomplished. The core philosophy of Learning Outcome Based Education (LOBE) rests in adhering to the student-centric learning approach used to measure students' performance based on a pre-determined set of outcomes.[10] Among others, of significant advantage of LOBE is in bringing out reforms in curriculum framework that has to be outcome based; constant upgradation of academic resources; raising quality of research and teaching; technology integration in the teaching-learning processes; bringing out clarity among students as to what is expected of them after they complete the programme and for teachers to bring focus on what to teach, how to teach, and evaluate. Resources, processes, curriculum, facilities, activities (both curricular and co-curricular), etc., need to be aligned to the expected outcomes, for which, clarity of what 'outcome' is, is a requisite.

Outcomes

Outcome is understood as "something that follows as a result or a consequence" (Macayan, 2017). In essence, outcomes are viewed as learning results that students are expected to demonstrate during or at the end of the educational experience.. In the words of Killen (2000), some outcomes are expected to be demonstrated at the course level, some at the programme level, and others at the institution level. But according to Spady (1994), the most important outcomes are those that reflect real-life roles that students will have to perform after they complete their education. The course-level outcomes and the programme-level outcomes need to be linked to the culminating outcomes, wherein students are expected to perform at their work/profession. Thus the focus of outcome-based education is more on attaining intended outcomes rather than the content and marks attained by students. A top-down approach needs to be adopted with the culminating outcomes being stated first, followed by programme-level outcomes and then course-level outcomes, which will ensure that all the levels of outcomes are systematically aligned, connected, and measurable.

Process of Implementation of OBE[11]

1) Establish mission statements, Program Educational Objectives (PEOs)
2) Mapping PEOs with mission statements

3) Define Programme Learning Outcomes (PLOs) with Blooms Taxonomy
4) Mapping PEOs with PLOs
5) Define Course Objectives (COs)
6) Define Course Learning Outcomes (CLOs) with Bloom's Taxonomy for every course
7) Mapping CLOs with PLOs
8) Aligning assessment and CLOs
9) Prepare assessment rubrics based on CLOs
10) Measure students' performance against CLOs, course-wise
11) Measure the attainment of each PLO through direct/indirect assessments
12) Assess the attainment of PEOs.

The process is detailed as follows:

1) Establish Mission Statements, Programme Educational Objectives (PEOs)

It is imperative that educational institutions first establish their mission statement when implementing OBE. The statement chosen must be oriented towards the future and help achieve the PEOs.

Programme educational objectives (Doran 1981) are broad statements representing the expected achievements graduates from a programme are supposed to attain few years after graduation (usually 3 to 5 years). The process of evaluation is guided by the educational aims that have been accepted and set up; the goal of evaluating students is to assess how effectively students are progressing towards their educational objectives. The PEOs depend on the goals, mission, and vision statements of an institution and organization along with the inputs from all its stakeholders like parents, students, alumni, society, employers, industry, professional bodies, faculty members, advisory board members, and regional and national interests. HEIs can design their institution-specific PEOs to evolve continuously along with the evolution of the social systems, and the ever-changing national and regional interests. Therefore, the first step in OBE is to determine the vision and mission statements. These statements highlight clearly defined desired outcomes and processes, have actionable plans, ensure resources, and measure progress. A well-articulated vision and mission can lead to monumental changes in student learning and achievement.

The following factors have to be considered while framing PEOs:

- The PEOs should be consistent with the vision and mission of the institution.
- All the stakeholders should participate in the process of framing PEOs.
- The number of PEOs should be manageable.
- PEOs should be based on the needs of the stakeholders.
- PEOs should be achievable by the programme.
- PEOs should be specific to the programme and not too broad.
- PEOs should not be too narrow and similar to the PLOs.

2) Mapping PEOs with Mission Statements

The programme educational objectives must be mapped with the mission statement of the institution wherein the dimensions of the PEO's must be consistent with the different elements of the mission of the institute.

3) Define Programme Learning Outcomes (PLOs) with Bloom's Taxonomy

PLOs are statements describing what students are expected to know and able to do by the time of graduation. In other words, PLOs are the skills and competencies that students should be able to articulate, put into action, or utilize after completing a degree programme. PLOs shall be based on Graduates Attributes (GAs) of the programme. GA is a set of individually assessable outcomes that are indicative of a graduate's potential to acquire competencies in that programme. The GAs are the attributes expected from a programme in terms of knowledge, skills, attitude, and values and graduates are expected to demonstrate these attributes when they complete their degree courses. GAs include knowledge of science or the field, critical thinking, problem analysis, design and development of solutions for complex problems, investigations of complex problems, reflective thinking, modern tool usage, environment and sustainability, ethics, individual and teamwork, communication, self-directed learning, communication skills, and lifelong learning.

PLOs provide guidance for the curriculum design, delivery, and assessment of student learning. Being generic in nature, these may not be directly measurable. Further clarity is necessary to connect PLOs with the content of the course, the course level outcomes, and assessment. This can be achieved through the process of identification of Competencies and Performance Indicators (PIs).

Competencies: For each PLO, competencies have to be defined. These are the abilities we want our students to achieve. Competencies serve as intermediate steps in creating measurable indicators. An example of a competency may include…. "Demonstrate the ability to discover and process information in the field of…."

Performance Indicators (PIs): For each competency identified, PIs must be defined. These are explicit statements of expectations of students learning. They act as tools of measurement in assessment to understand the extent of outcomes attained. An example may include:

- apply principles of ….
- construct concepts ….
- make inferences, discern, evaluate …..

The entire exercise of preparing the PLOs along with identification of competencies and performance indicators must be based on the six levels of the revised Bloom's Taxonomy. It's a well-known fact that learning outcomes typically fall into three basic categories, knowledge, skills, and attitude. The six levels of the revised Bloom's Taxonomy must be considered when writing the PLOs. The levels include remembering, understanding, applying, analysing, evaluating, and creating. Each level has action verbs based on which the PLO must be defined.

4) Mapping PEOs with PLOs

The mapping can be indicated numerically (5 to 1, with 5 being highest) or in terms of strong, medium, low, and so on. They may also be mapped in terms of the PLOs to a particular PEO.

5) Define Course Objectives (COs)

COs are essential for the successful implementation of OBE as it is imperative to identify whether the objectives are met during the process. COs need to be broad statements so as to incentivize learning.

6) Define Course Learning Outcomes (CLOs) with Bloom's Taxonomy for Every Course

These are the outcomes/knowledge, which every student is expected to gain at the end of completion of each course (subject) and as a result of learning. CLOs are narrower statements that describe what students are expected to know, and are able to do at the end of each course:

- should reflect the level of knowledge students gained, skills acquired and attributes developed after successfully completing the course;
- must be measurable, attainable and manageable in number; and
- should contribute to attain PLOs in such a way that each CLO should address at least one of the PLOs and also each PLO must be reasonably addressed by adequate CLOs.

All courses put together are the realization of the programme. Students can get an immersive experience of the programme only if the courses are well-crafted. The courses must progressively provide the domain content and skills required from the simplest to the most complex, and with increasing intellectual requirements. A particular course can be understood or taught in the context of associated courses but by following a progressive sequence. Thus, CLOs cannot be developed individually or in isolation. They need to be mapped with the curriculum.

An effective CLO is a measurable, observable, and specific statement that indicates what a student should know and be able to do as a result of learning.[12] Well written course learning outcomes involve the following:

a) Action verb: to be selected using Blooms Taxonomy. Care has to be taken to select the action verb that is observable and measurable as applicable to the course. Some action verbs, which may pose a challenge to assess are know, study, appreciate, become acquainted with, be aware, learn.... Illustrated in Table 1.

Table 1. Action Verb

Remember	Understand	Apply	Analyse	Evaluate	Create
Describe	Explain	Complete	Compare and contrast	Justify	Plan
Name	Compare	Use	Examine	Assess	Invent
Find	Discuss	Examine	Explain	Prioritize	Compose
List	Predict	Illustrate	Identify	Recommend	Design
Relate	Outline	Classify	Categorize	Rate	Construct
Write	Restate	Solve	Investigate	Inspect	Synthesize

b) Subject content: to be considered while preparing CLOs.

c) Level of achievement/condition of performance/context: identifies how proficient students need to be in a given task. On the other hand, a condition of performance identifies whether students are performing the

outcome in a specific context for a specialised course which requires hands on work.

The CLOs should ideally have only one action verb and one area of the subject content. But if there are multiple action verbs, then the one that articulates the highest level of learning should be focused upon.

The revised Bloom's Taxonomy is a very useful tool to write learning outcomes of a course. It provides a list of verbs with increasing levels of complexity, which helps to identify the nature of students learning activity.

Understanding Bloom's Taxonomy of Educational Objectives

One of the most widely used ways of organizing levels of expertise is through the Blooms Taxonomy of educational objectives that provides the level of expertise required to achieve each measurable course learning outcome. The Taxonomy is most widely referred to while designing educational and learning processes. The Taxonomy was created in 1956 by Benjamin Bloom along with collaborators Max Englehart, Edward Furst, Water Hill, and David Krathwohl.[13] The Taxonomy is a framework that classifies what we expect the students to learn as a result of the teaching activities. The framework consists of six major categories: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. Three major domains of educational objectives identified by the committee are: Cognitive — mental skills (knowledge); Affective — growth in feelings or emotional areas (attitude); Psychomotor — manual or physical skills (skills). The Taxonomy provides for the goals of the learning process that a student goes through, that is, after the learning process, the student should have acquired a new skill, knowledge and/or attitude. The Taxonomy provides definitions of the six major categories in the cognitive domain (Bloom, 1956), and the knowledge category embodies both the noun and verb aspects.

The revised Taxonomy provides for a more active form of thinking (Anderson, 2001) and points to a dynamic conception of classification. The revised Taxonomy uses verbs and gerunds to label categories and sub-categories rather than nouns in the original Taxonomy.[14] In the revised Bloom's Taxonomy (Krathwohl, 2002), the noun and the verb have separate dimensions: the noun provides the basis for knowledge dimension, the kind of knowledge to acquire; and the verb forms the basis of the cognitive dimension or the process used to learn.

Cognitive Process Dimension

1. Remember: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
2. Understand: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
3. Apply: Carrying out or using a procedure through executing, or implementing.
4. Analyse: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
5. Evaluate: Making judgments based on criteria and standards through checking and critiquing.
6. Create: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

The Knowledge Dimension

1. Factual: knowledge of terminology; knowledge of specific details, and elements.
2. Conceptual: knowledge of classifications and categories; knowledge of principles and generalizations; knowledge of theories, models, and structures.
3. Procedural: knowledge of subject-specific skills and algorithms; knowledge of subject-specific techniques and methods; knowledge of criteria for determining when to use appropriate procedures.
4. Metacognitive: strategic knowledge; knowledge about cognitive tasks, including appropriate contextual and conditional knowledge; self-knowledge.

The intersection of Knowledge and Cognitive Process Dimensions may be presented in the form of a grid as shown in Table 2. This helps in mapping course outcomes, performance indicators, competency, and assessment.

Table 2. Intersection of Knowledge and Cognitive Process Dimensions

	Cognitive Process Dimension					
Knowledge Dimension	**Remember**	**Understand**	**Apply**	**Analyse**	**Evaluate**	**Create**
Factual	List	Summarize	Classify	Order	Rank	Combine
Conceptual	Describe	Interpret	Experiment	Explain	Assess	Plan
Procedural	Tabulate	Predict	Calculate	Differentiate	Conclude	Compose
Metacognitive	Appropriate Use	Execute	Construct	Achieve	Action	Actualize

7) Mapping CLOs with PLOs

This mapping focuses on student learning and allows the faculty to create a visual map of the programme. This mapping makes it possible to explore how students are meeting programme outcomes at the course level.

8) Aligning Assessment and CLOs

The most important step after deciding on CLOs is its alignment with the type of assessment for the topic under consideration. CLOs prescribe what students are expected to demonstrate on what they have learned, whereas the assessment plan shows how they will demonstrate their learning. As CLOs are statements that predict what learners will gain as a result of learning, a well-written CLO will clearly indicate the types of assessment that are appropriate, and the skills and knowledge the learner will have to demonstrate to succeed in the course. Therefore, if the CLOs are clearly written, it is easier to plan the type of assessments to be utilized.

To ensure effective learning there is a need for the constructive alignment of the curriculum, which ensures that the PLOs, the CLOs, the instructional strategy, and the assessment techniques, all complement each other. The academic success for students is not demonstrated in terms of what they should remember, but with what they are able to apply the acquired knowledge to. It is important to understand that merely focusing on lower-order cognitive skills such as memorization or recall will serve little purpose in transforming students. The application of knowledge and critical thinking, which are higher-order cognitive skills are of immense importance. To ensure the alignment of assessment with the CLO, Bloom's Taxonomy is of utmost

importance. Classroom instruction and assessment also needs to be given due importance. If the teaching during the lectures focuses on higher-order skills and the students are tested on recall, they may think that the higher-order teaching may not be required, on the other hand, if all basic information is discussed during the lectures and if the students are tested based on the higher-order skills, then they may not perform as per expectations. This mis-match can be a challenge to address, both, for the teachers and the students. Using Bloom's Taxonomy of cognitive domain may address this situation and help in choosing the correct teaching and assessment strategy, based on the topics to be covered.

An illustration of mapping course learning outcomes with competency using the taxonomy is outlined in Table 3. Table 4 illustrates the alignment of assessment using Bloom's Taxonomy.

Table 3: Mapping CLOs using the Taxonomy

Course Learning Outcome	**Knowledge Dimension** (Type of Knowledge Acquired)	**Cognitive Process Dimension** (Process used to learn)
CLO-1: Students will be able to understand the microeconomic concepts and principles and their relevance in business decision-making.	Factual Conceptual	Understand Apply
CLO-2: Students will be able to understand and apply the demand and supply concepts and their elasticity in real market conditions for effective business decisions.	Procedural Meta-cognitive	Understand Apply Analyse Evaluate
CLO-3: Students will be able to understand input-output relationships and economic drivers behind business strategy of expansion and diversification.	Conceptual Metacognitive	Remember Analyse
CLO-4: Students will be able to explain economic profit-using cost and revenue concepts.	Conceptual Procedural	Remember Understand Apply

Table 4. Alignment of Assessment using Blooms Taxonomy

Learning Outcomes	Teaching Learning Activity	Assessment	Sample assessment
Remember	Lecture, Reading, Tutorials	Formative — Q & A, Summative — EoT (End of Term)	Label the parts of an equipment
Understand	Reading, Demonstration, Discussion	Q & A, Presentations, demonstrations	Trace the path the component 1 takes to compete its task
Apply	Demonstration, demonstrate application	Q & A, Demonstration, EoT	Apply the theory to predict what will be the real-world outcome
Analyse	Case Studies, Labs, Discussion, Simulations	Presentation, Q & A, Portfolio, Essays, EoT	Compare and contrast theory 1 to theory 2
Evaluate	Demonstration, Case Studies	Group Discussions, Q & A, EoT	Evaluate the guidelines and provide its strengths, Will it be effective?
Create	Lab work, Case Studies, Interview with experts	Group Discussions, Presentations, Project work	Choose a problem and create a way to mitigate the effects

9) Prepare Assessment Rubrics based on CLOs

A rubric for assessment, also called a scoring guide, is a tool used to interpret and grade students on any kind of work against criteria and standards. An assessment rubric provides the means to increase objectivity in assessment and reduce subjectivity; presents a clear expectation on the assessments, and relates it to learning outcomes; ensures consistency, transparency, and fairness in the marking process across course instructors for the same assessment type; efficiently grades or marks many assessments for a large group of students; defines clear guidelines for moderation; and provides more objective data for analytics.

Types of Assessment Rubrics

Holistic Rubric: assumes that the work must be evaluated as a whole rather being treated as a sum total of different criteria. The focus is on overall assessment of

a specific content or skills. Only one score is given for the entire work/task. It is generally useful for simple tasks. For instance, a short essay may be graded by considering all the criteria together.

Analytic Rubric: features a grid of criteria and levels of achievement. They provide specific feedback along several criteria. It is suited for tasks that must be assessed against several criteria.

Structure of a Rubric

It is a matrix of criteria and their descriptors. The descriptors are stated based on marks or grades. The assessment criteria define the characteristics or traits to be judged, which should be derived from the CLOs and indicate what is expected to be demonstrated.

For instance, the learning outcomes such as: describe…, demonstrate…, investigate…, can be stated as criterion and/or descriptor. And the outcome expected shall be stated and may be provided as grades or marks (for example, 4 marks/points or "outstanding" can be given to students who are able to effectively describe or demonstrate and 1 mark/point or "needs improvement" can be given to students who are not clear regarding the assignment or project).

Table 5. Illustration of an Assessment Rubric

Criterion	**Level of Performance (select what best describes the student's performance)**			
	Outstanding	**Good**	**Average**	**Poor/Needs Improvement**
Content	All points regarding work/ thesis/ project clearly made	Many good points regarding work/thesis/ project	A lot of information but not clearly connected to work/thesis/ project	Not clear and information not related
Coherence and Organization	Examples appropriate; presentation flows well; well-organized	Mostly logical and organized; needs better transitions	Concepts and ideas loosely connected; lacks clear transitions	Disjointed, no connection to students' ideas
Communication skills	Poised, clear articulation; enthusiasm, confidence, eye contact	Clear articulation but not as polished	Little eye contact; little to no expression	Inaudible; no eye contact; disinterested

10) Measure Students' Performance against CLOs, Course-wise, through Direct and Indirect Assessments

Measuring the students' performance will provide inputs to the faculty in terms of the instructional strategy adopted, the assessment types and propose improvements, if any. Attainment of CLOs is computed using Direct and Indirect Assessment Methods.

- Direct Method of assessment is based on the performance of the student in university examination, internal assessment, assignments, term work and oral and/or practical examinations.
- Indirect Method of assessment is based on periodical feedback from stakeholders at the end of each course.

11) Measure the Attainment of each PLO

At the end of the programme, the attainment of PLO is computed by way of attainment of all CLOs. The final attainment of PLOs is computed through the attainment and/or evaluation of CLOs (direct attainment) and through exit surveys and alumni surveys (indirect attainment).

12) Assess the Attainment of PEOs

This may be done after the students have passed out from the institution.

CONCLUSION

Reforms in evaluation conducted at HEIs is a key area of concern and institutions must undertake these reforms considering the larger interest for student learning and development. We have focused on the higher education sector in India and briefly provided the structure of the HES, the regulatory bodies, etc. The challenges faced by the sector have been traced through referring reports by the UGC and other research papers. Institutions have to overcome the challenges in order to maintain high quality and academic standards. The rationale here is outcome-based education. We have put forward the steps that need to be undertaken to effectively implement the concept. The implementation of the concept needs consideration of the categories of the revised Bloom's Taxonomy, which is essential to the measurement or attainment of outcomes. If the OBE is implemented by HEIs, it will lead to the achievement of goals for all stakeholders involved.

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EDUCATION SYSTEM
Student Tracking and Alumni Network

Sushila Singh*

Education is the most vital subject for every thinker and every lover of his country because the future of the land depends on education. Educationists, such as Annie Besant consider education a national duty. With the people as the prime stakeholders, education is in the public domain. Therefore the government can help create the system. To make it work, education must be taken up as a mission, designed, guided, and carried out by those who love their country and also understand its special needs, characteristics, and traditions. Moving along in the present, education must also be founded on the knowledge of the ancient history of the country. The education system must be designed in accordance with the ancient traditions and national character, and adapted to present-day requirements.

Indian ideals flowered and shaped the national life in the country and 'created' education and culture. Thought and philosophy behind the idea of India blossomed into national activity — education being one of its manifestation. "Man is created by Thought, and what a man thinks upon that he becomes; therefore think upon Brahman" — so is revealed in the *Chhandogya Upanishad* (III, xiv, 1). The Upanishads tell us of the ideal teacher — the guru, who inspires before he teaches and of the ideal student — the *shishya*, who sits near his teacher with devotion to receive instruction about the highest reality, which dispels all doubts and destroys ignorance.

The fundamental principles of knowledge in India evolved around the thought of the Supreme that created a civilization unrivalled in its spirituality. Creativity resides only in the manifestation of the Supreme — Brahman. There is a primary concern for the progress and perfection of humanity in the thoughts of teachers such as the Buddha, Swami Vivekananda, Mahatma Gandhi, Annie Besant, Sri Aurobindo, and Pandit Madan Mohan Malaviya. At the turn of the 19th century, Swami Vivekananda asserted that an anglicized India would spell disaster not only for her but for the entire world. He placed the ideal of "man-making" before teachers as the core objective of education. To him, all the knowledge was there in the children, as it is in all human beings, and education had only to bring them out and make the student self-confident, self-reliant and strong. He defines education:

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- Education is not the amount of information that is put into your brain and runs riot there, undigested, all your life. We must have life-building, man-making, character-making assimilation of ideas. If you have assimilated five ideas and made them your life and character, you have more education than any man who has got by heart a whole library.
- The ass carrying its load of sandalwood knows only the weight and not the value of the sandalwood. If education is identical with information, the libraries are the greatest sages in the world, and encyclopaedias are the Rishis. The ideal therefore is that we must have the whole education of our country, spiritual and secular, in our own hands, and it must be on national lines, through national methods, as far as practicable.

(Swami Vivekananda, *Complete Works*)

The indomitable energy of the youth has to be reflected not only in their studies and in endeavours at self-mastery, but also in the loving and dedicated service to fellow-beings. Swami Vivekananda believed that the education of a young man is never complete without his developing this sense of service. Sri Aurobindo thought of education as the means for re-building of India. Through education an individual has to be prepared for the sake of society in which he or she lives. Education, then, should not compartmentalize human activities. It must present an integral approach to life.

STATUS OF EDUCATION

The present status of education has to be reviewed and reconsidered. The youth today are at the crossroads. There seems to be a disconnect with the national goal and personal aspirations. The youth today have this major hurdle to surmount that often times education not only frustrates them because it fails to prepare a majority of them to be competitively employable but also fails to excite their young minds. Their energies do not get effectively channelized towards the creativity, innovation, and research essential for nation building. With these issues in mind the Draft National Education Policy 2019 (DNEP-2019) is under way for implementation. It is aimed to meet the changing dynamics of the population's requirement of quality education, innovation, and research aiming to take India on the path of becoming a knowledge superpower.

WHO IS THE IDEAL?

The question arises who is the ideal student and who is the ideal teacher? There was a fourfold scheme of education for the *brahmacharya* or student

stage in ancient India: service, study, simplicity, and self-control. The student life of Lord Rama may be taken as a model case in point, as also the student stage of the Kaurava and Pandava sons. With rigorous discipline arises noble emulation, patriotic ambition making the schools as nurseries for future heroes and achievers. The education system needs to gear up for making the ideal student.

For making of the ideal student, the teacher has to be ideal. The ideal teacher is one who inspires; a role model who gives the best of himself or herself to the pupil. Attributes of a teacher are defined: he or she makes the students realize these in their life. This is why the vocation of a teacher is so onerous. A teacher has the fathomless power to make and transform pupils. But to do great things in education, freedom is required which in turn fulfils Indian ideals, spirit, unity, purpose, and life.

STUDENT TRACKING AND NETWORKING

When teachers transform their students and the "man-making" process is complete, student tracking can be achieved easily because the teacher-student bonding is strong. Today, it remains a big challenge to keep track of students who pass out of education portals because there are huge numbers of drop outs; students who discontinue their studies midway. The system has failed to enthuse students to connect with their educational institutions. By and large, there is a lack of connectivity between education institutions and the alumni excepting for some professional or technical institutions such as the IITs, IIMs, and some private institutions.

Communication is one of the most important goals to attain. An effective alumni relations communication system requires electronic, print, and face-to-face modes. Research and survey in the area of alumni relations need to be made a compulsory component in Higher Education Institutes (HEIs). Research for making the services effective and linking the alumni to their alma mater is vital. Mechanisms for alumni networking have to be evolved. These might call for a total overhaul of the education system. For example, information on each alumnus can be easily accessed. Through the communication network individual needs can be assessed and facilitated. The alumni relations units benefit in a number of ways in this manner. By establishing dynamic and interactive web portals alumni can easily update their own records, register for events, and pay dues online. This enables the staff to spend their time in more direct service to alumni. The alumni database needs to be richer, more

robust, and very accurate. At the same time, the database and the electronic connection with the alumni has to be fully secure. Printed alumni magazines also need to be regularly published. The dual approach of electronic and print communication will help to connect the alumni to their alma mater.

Serving alumni, through institutional efforts, needs to include face-to-face communication as well. Rising numbers of female alumni must be taken in account while devising alumni services. The fact that alumni have emotional attachment to their alma mater must be taken into account. The alumni associations are now recognizing that they must learn more about the desires of their alumni. For this, alumni associations/units have to commit themselves to research and to surveying their alumni regularly.

Electronic communications will continue to increase and paperless offices are the need of the future. Alumni will communicate electronically more frequently and more extensively, and alumni offices and systems will do the same. Electronic communications will provide alumni relations units and offices quality information, and will enable them to operate more efficiently. Alumni relations network has to be expanded electronically through creating web portals and effective alumni gateways. A digital face is essential for leading to paperless offices. Having observed the 150th birth anniversary of Mahatma Gandhi in 2019, and as a tribute to him, this focus could be a giant step towards a sustainable green India.

FOCUS OF ALUMNI RELATIONS

Alumni relations units need to be part of the formal academic and administrative structure of the education system. The responsibilities include:

- identifying and tracking alumni;
- keeping alumni regularly informed about the alma mater and keeping everyone closely connected;
- continually developing or increasing interest in the alma mater both through communications and programming;
- actively involving alumni in the life of the university; and
- creating and providing meaningful opportunities for alumni to give back — to invest in future alumni or in the future of the institution.

Scholarships to meritorious and needy students may also become an essential responsibility of the alumni. Mentoring and counselling of the students by

recently passed out alumni need to be encouraged. Virtual groups can facilitate alumni to connect to other alumni through mutual interests on the web portal of the educational institutions. Alumni units and bodies have to operate according to the rules and regulations of the educational institutions. Through various educational, cultural and service-oriented programmes, the universities and other education institutions need to value and create mechanism to always warmly welcome alumni. The university-alumni close bonding requires to be strengthened at the institutional level through integrating the various units and individually.

NATIONAL ACADEMIC DEPOSITORY (NAD)

An important beginning has been made in the direction of student tracking and alumni network by creating the NAD. Central Educational Institutions such as Central Universities, Central Higher Educational Institutions, and institutions empowered by an Act of Parliament to grant degrees and diplomas, State universities, deemed-to-be universities, and other universities are participants. This is a major step in student tracking and taking it further to alumni networking. The vision of NAD is to provide an online storehouse of academic awards. Maintaining academic awards in an electronic depository provides benefits to educational institutions, students, and employers by enabling online access to academic awards. Once successfully operationalized with full data security measures, it could go a long way in tracking students and alumni relations.

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ANCIENT INDIAN EDUCATION SYSTEM VERSUS MODERN EDUCATION METHODOLOGY

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We are making a comparative study and analysis of the ancient education system on the one hand and the modern education methodology on the other. There is special focus on the criteria of Paramarsh — the University Grants Commission (UGC) scheme for mentoring the National Assessment and Accreditation Council's (NAAC's) aspirant institutions to promote quality assurance in higher education. Education is the process of the gradual and systematic summoning of the tendency in the human being to the realization of perfection. As the concept of perfection is unclear in the initial stages, the approach to the mind of the public has to be made with immense patience and care. When it is dealt with in persons, it is really concerned with their minds and hence all successful approach in life is psychological.

In our ancient education system, the methodology was that the physical, intellectual, emotional, moral, active, and spiritual, fitted all at once and beautifully to the conditions, and thereby culminated in the development of personality, adequate knowledge of the world, adjustment of self with the society, and realization of the permanent values of life. It was in a sense, diving inward and spreading and exploring outward. The teacher had to be a good psychologist and not regard teaching as a kind of business or barter with the students. This pleasant process of imparting knowledge is education. Education being a basic component of human development, its interface with sustainable development is well established. Education is perhaps the single most important means for empowerment and for sustained improvement in the overall well-being.

The education system in our country has a strong foundation since time immemorial, when Vedic hymns were studied as the literature to be understood, appreciated, emulated, and even the composition of new hymns was the level of excellence in the *gurukulas*. Obviously, this trend continued through the ages as some of the poetic creations of later philosophers were selected for including in the Vedic literature. For example, the works of Acharya Nagarjuna, Acharya Kumarila Bhatta, and Adi Shankaracharya, form an integral part of the prestigious Vedic literature.

Professionals committed the hymns very thoroughly to memory to ensure their use while performing different rituals. More effort was also made to understand the meanings of the hymns besides memorizing them.

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Correct appreciation of human values is essential before introducing any suitable method of education. A student needs is not philosophy or religion in the academic or formalistic sense of the term, but the ability to think rightly. Education is not the mere accumulation of information, but assimilation of reality by degrees. When educationists forget this fundamental truth behind the educational process, education becomes a travesty and life a meaningless adventure.

CURRICULAR ASPECT

It is important to have a relevant, well-structured curriculum that answers questions about the future and equips students with all the necessary skills and knowledge. The pedagogy in a *gurukula* system was that every individual was considered a unique personality and accordingly, knowledge was imparted for the holistic development of the student. The following hymns throw light on the relevance of the education system, in correlation with the "curricular aspects" of NAAC. The implied meanings or summarized concepts of the verses are given for clarity.

अंगानि वेदाश्च त्पारः मीमांसा न्यायविस्तारः ।
पुराणं धर्मशास्तम च विद्या हेताश्चर्तुदश ।।

Six Vedangas, four Vedas, Mimamsa, Nyaya, Puranas, and Dharma shastras are the prominent fourteen branches which are taught in the *gurukula*s.

धर्मार्त काम मोक्षाणाम् यस्य कोपिन विद्यते ।
अजागलस्थनस्य वतस्यजन्म निरर्थकम ।।

A person who has no qualities of any one out of the four *purushartha*s, his life is wasteful, as the beard which swings on the cheek of a goat. (*Purushartha*, the aims of goals of life).

भूर्दारयति सत्येन सत्येनोदयतेरविः ।
सत्येन वायुः पवते सत्येनापः स्रवमति च ।।

It is with the strength of 'Truth', the planet Earth sustained the mountains; it is with the strength of 'Truth', the sun rises; it is with the strength of 'Truth' the wind blows and it is the strength of 'Truth' the water flows.

गीतादि मोहनकला जठरावनायतर्कादि धोरण कलाजन गौरवाय ।
वेदादि पावनकला परभाव नायत्वाव भोधनकला भवते मृताय ।।

Music and other fine arts are meant for livelihood by amusing the people; the logic and other branches of knowledge of humanities are meant to acquire reverence from the people, Vedas and other sacred scriptures are meant to

acquire better life after the death, but Atma Tatva is meant only to acquire 'Enlightenment'.

मातेवरक्षति पितेव हिते नियुमक्तेकाम्तेव चापि रमयत्यपनीयखेदम् ।
लक्ष्मीम्तनोति वितनोति च दिक्षुकीर्तीम्किम् किम् न साधयतिकल्पलतेव विद्या ? ।।

It is the knowledge, which cares like a mother, enthuses in good deeds like a father; music, serves like wife, brings wealth and happiness, spreads the fame to all corners. Hence, knowledge is considered as Kalpavriksha (the wish-fulfilling, divine tree), which gives boons to mankind.

माधुर्याम् अक्षरव्यक्तिम् पदच्छेदस्तु सुस्वरः ।
धर्यम् लयसमर्थम् च शडेते पाठकीगुणाः ।।

Melody, knowledge of linguistics, brevity, bravery or confidence, harmonious or tunefulness and fluency — are the six teaching qualities.

स्थाणुरयम् भारहारः किलाभूत् अदित्यवेदंनविजानातियोर्थं ।
योर्थज्ञइत्सकलंभद्रमश्नुते नाकमेति ज्ञानविधूतपाप्मा ।।

He who learns without understanding the knowledge properly, is like a pillar shouldering the burden; he who acquires the knowledge by understanding the meaning properly, will definitely derive all good benefits from it and definitely treads the path of Heaven (Sage Yaaska–Nirukta).

राजपत्निगुरोः पत्नि मित्र पत्नितथैव च ।
पत्नि माता स्वस्य माता पंचौते मातरः स्मृताः ।।

The wife of a master, the wife of a preceptor, the wife of a friend, the wife's mother and one's own mother are considered the five sacred mothers to a person in his life.

उद्यमेनैव सिद्धयन्ति कार्याणिन मनोरथैः ।
न हि सुप्तस्य सिम्स्य प्रविशंति मुख मृगाः ।।

It is only by effort will the work get fructified, not merely by wishes. No animal will come and fall into the mouth of a sleeping lion.

हतमज्ञानमक्रियाहिनम हताचाज्ञानिनम क्रिया ।
धावन्नप्यमधको नष्टः पश्यन्नपि च पंगुकः ।।

Work without knowledge is waste, knowledge without work is waste. Goal without path to achieve is also waste.

TEACHING LEARNING AND EVALUATION

NAAC addresses the regular academic activities of the institution. The teaching-learning processes, students' results, desired outcomes, and so on, come under these activities. The first criterion, the curricular aspect, deals with 'What' in learning, this one assesses the 'How' the learning happens. Various evaluation and assessment practices are also a point of interest here.

The ancient Indian education is spread over several centuries and therefore considerable changes taking place in the curricula in the course of millennia. As a curriculum is intimately connected with the achievements, aspirations, changes of people's outlook on life, and new areas of knowledge are developed, changes become inevitable.

Traditionally, students were not at liberty to change a difficult archaic word for a simple contemporary one. The differentiation of the spoken dialect from the Vedic language raised new problems of interpretation and the effort of the time was to solve them by preparing a list of difficult Vedic words and expressions, which were carefully expounded to students. Vedic students were not only expected to memorize the Vedic hymns, but also be adept enough to explain their meanings.

उदये सवितारक्तोरक्तस्थमयेतथा ।
समपत्तौ च विपत्तौ च महतामेकरुपता ।।

The colour of the Sun doesn't changes during sunrise and sunset; in the same way great personalities will remain same during good and bad times in their life.

दुर्जनः परिहर्तव्यः विद्ययालमकृतोपि सन् ।
मणिना भूषितः सर्पः किमसौ न भयंकरः ।।

A person with bad intentions, irrespective of the education or knowledge he possesses, should be avoided just as the snake regardless of having a diamond on its forehead is venomous.

RESEARCH, INNOVATION. AND EXTENSION

This criterion is about the academic research, extended consultancy services from an institution towards the industry. The field of study, and extension is the outreach of the institution towards society, addressing various real-life problems, finding solutions, and other extracurricular activities to improve the overall quality of the institution.

Education was imparted for a long time through oral lessons, without the medium of a book. The teaching was direct and personal between the teacher and the student. The teacher would pronounce only two words at a time of a Vedic *shloka* (verse or stanza), and the student would recite that with exact intonation and accent. If the expression happened to be a compound one, only one word would be uttered. If the student had any difficulty, the teacher would explain. When one student learnt a whole verse, the same process was repeated with the next student. Every student necessarily received individual attention under this system.

आलस्यम मनुष्याणाम शरीरस्थो महान् रिपुः ।
नास्तुद्यमसमो बंधुः कुर्वाणो नावसीदति ।।

Laziness is the big enemy, which resides in one's body; there is no relative equal to enterprising nature, because no one will get spoiled, when he swings into action with utmost dedication.

गतानुगतिको लोको न लोकः पारमार्थिकः ।
गंगैसैकतलिंगेन नष्टम मे ताम्रभाजनम ।।

One who came for a holy dip also followed him blindly and several similar Shivalingas type heaps formed leading to confusion to fin done's own.

गुणदोषौ बुधोगृह्णन् इंदुक्श्वेडाविवेश्वरः ।
शिरसाक्षाघते पूर्वम परमकमठे नियच्छति ।।

The one (Lord Shiva) who happened to receive both poison and the moon, he managed to hide the poison in his throat and the moon on his head. Likewise, a wise man should always identify the sins and virtues of the one who comes in contact, but should forgive and forget the sins and recognize only the virtues.

INFRASTRUCTURE AND LEARNING RESOURCES

The focus is to assess the physical academic facilities and support system. Having a good learning environment and necessary facilities are important while working towards the quality of education. Classrooms, laboratories, technology, facilities for physical fitness and medical purposes, and proper and sufficient reference materials, are all vital for assuring the higher educational quality of an institution.

देशाटनम पंडितमित्रता च धीरामगनाराजसभाप्रवेशः ।
अनेक शास्थ्रर्थाविलोकलम च चातुर्यमूलानि भवंति पंच ।।

Frequent travelling to different countries, friendship with learned scholars, presence of great learned women for guidance, eligible to be in the king's court, and analysing the understanding different religions; the science of all these are the five virtues of attaining the real purpose of the life of a human being.

युक्तियुक्तम वचो ग्राह्यम बालादपि शुकादपि ।
अन्यत् तृणमिवत्याज्यम अप्युक्तम पद्मजन्मना ।।

If it is relevant and meaningful, we should respectfully hear the wise words, it does not matter even if it has come through a small boy or a parrot. On the other hand, if it is not worth, we may totally reject such words as trash, even if the same has come through a brahmin.

STUDENT SUPPORT AND PROGRESSION

The focus for this criterion is to ensure proper participation of students in academics, and students' support for the institution. Mentoring and guidance for students in various aspects of education and their fields of study also matters. Helping and guiding students contributes to the overall quality of education. How an institution facilitates the progression of students to higher levels of education and/or towards employment is equally important.

Since early times, debates and discussions have always played an important part in the literary training of students. Vedic literature refers to such literary 'combats' and describes how the victors were suitably honoured. During those times, pupils were taught the realities of life, extending moral support for each and every aspect of life, to the minutest detail. The following *shlokas*, unravels the support and progress extended to a student.

संपदः स्वप्नसमकाशाः यौवनम कुसुमोपम ।
विद्युच्चमचल मायुष्यमत स्मात् जाग्रतजाग्रत ।।

One must be aware that wealth is as uncertain as a dream; youthfulness fades away like a flower and life span is as short as lightening, hence be awakened always.

अनंतशास्त्रम बहुवेदितव्यम अल्पच्शकालो बहवच्शविग्नाः ।
यत् सारभूतम तदुपासितव्यम हंसो यथाक्षीर मिवांबु मिश्रं ।।

The ology to be studied and understood is enormous, but the life span so limited and that too with so many obstacles. Hence, it is advisable, we grasp the essence of the same and follow, like a swan which could separate the water from milk and drink only milk.

वयोबुद्दर्थवाग् वेषश्रुताभि जनकर्माणाम ।
आचरेत् सदृशिम वृत्तिम अजिह्मा अशठाम तथा ।।

One shall conduct himself judiciously, purely such that it is accordance to youth and appropriately match his age, intelligence, wealth, dress, education, and power.

त्रिभिर्वर्षैः त्रिभिर्मासैः भिः पक्षैः त्रिभिर्दिनैः ।
अत्युक्तटैः पुण्यपापैः इहैव फलमन्शुते ।।

One's good deeds or sins are so powerful that one may have to face the consequences perhaps after three years, or three months or three fortnights or three days or at that moment itself.

चिंतनीया हि विपदां आदावेव प्रतिक्रिया ।
न कूपखननम युक्तम प्रदीप्ते वह्नि नागृहे ।।

One should ponder on and be ready with solutions for the expected future problems, that may arise, otherwise it would like starting to dig a well to get water only after the home is on fire.

गच्छन् पिपिलिको याति योजनानां शतान्यपि ।
अगच्छन् वैनतेयोपि पदमेकं न गच्छति ।।

By its attempt and effort to make a move, even an ant can traverse hundreds of miles with its micro step-by-step movement; But even the Garuda cannot move even an inch if it does not make the attempt to move.

यदि संतिगुणाम पुंसाम विकसमतै वते स्वयम ।
न ही कस्तूरी कामोदः शपथेन निवार्यते ।।

Virtues exhibit themselves automatically, from within themselves, just as, nobody can prevent, by any means, the fragrance of Kasturi being spread. (Kasturi, the scent gland of a musk deer).

GOVERNANCE, LEADERSHIP, AND MANAGEMENT

Governance and management are the backbones of the institution. Having a well-structured governing body and management helps to find and address gaps in practices, and efficiently implement proper counter-measures in time. The quality and future of an institution depends on it. Internal quality assurance, faculty empowerment, financial resource management, strategy development, all come down to this important aspect.

यस्य नास्ति भयम प्रज्ञाशास्थ्रम तस्यकरोतिकिम ?
लोचनाभ्यां विहिनस्य दर्पणः किम करिष्यति ।।

If a person doesn't have self-consciousness, irrespective of how many times you teach that person, the level of understanding would be the same as in the case of placing a mirror in front of a blind human being; it would be immaterial to him or her.

असन्मानेतपोवृद्धिः सन्माना च्चतपःक्षयः ।
पूजया पुण्यहानिः स्यात् निंदया सद्गतिर्भवेत् ।।

To a wise person who doesn't aspires for any recognition or awards, what matters most is increase of knowledge rather than longing after materialistic possessions; vice-versa, a person who is always after awards and recognitions would never have real knowledge and wisdom.

कालो हि सकृदभ्येति यन्नरम कालकाम क्षिणम ।
दुर्लभः स पुनस्तेन कालकर्मा चिकीर्षता ।

Everybody waits for an opportunity through the entire life to become what they aspires for, but if they are not able to utilize that opportunity at that specific point of time they would only regret because a lost opportunity never comes back.

निरुत्साहस्य दीनस्य शोकपर्या कुलात्मतनः ।
सर्वार्ता ह्यवसी दमति व्यसनम चादिगच्छति ।।

For a spiritless, dull, sad, and confused person, irrespective of the amount of effort put in, the work is never successfully done because the task is never completed due to the continuous lacunae.

निंदुंतु नीति निपुणाः यदि वास्तुवंतु
लक्ष्मीः समाविशतुगच्छतु वा यथेष्टम् ।
अद्यववा मरणमस्तुय गाम् तरेवा
न्याय्यात् पथः प्रविचलंति पदम् न धीराः ।।

A moral human being is one who understands the walks of life in such a way that he never bothers about materialistic stuff, criticism, and money; and he doesn't fear death as he is ready to accept whatever comes at any point of his life because he has already attained the highest plateau of morality in his life.

INSTITUTIONAL VALUES AND BEST PRACTICES

Parables were often used to expound obscure principles, as would seem from the plot of the *Hitopadesa*, *Subhashita Ratnakara*, *Subhashita Sooktavali*, *Kathasaritsagara, Bruhatkatha* and the *Panchatantra,* where the principles of politics are taught under the guise of telling stories about animals. Many teachers realized the value of comparison and observation when they tried to develop the power of understanding in dull students by asking them to carefully observe new facts and compare them with known facts.

To make personal supervision more effective, the cooperation and help of advanced students were enlisted in the cause of education. These advanced students could guide the studies of their juniors under the general supervision of their teachers. The students of *gurukula***s** at Valabhi, Taxila, Nalanda, followed this method. For example, the Kuru prince Shrutasoma, who acquired proficiency earlier, was entrusted with teaching his brother prince, the heir apparent of Benares. Senior students at Taxila were often put in charge of their schools during the temporary absence of the teachers. This method of entrusting teaching work to brilliant students had great educational value. The qualities of such suitable students are elaborated in the following *shloka***s.**

लोकयात्रा भयम् लज्जाक्षिण्यम् दर्मशीलता ।
पंच यस्मिन्न विद्यम्त् न कुर्यात् तेन संगमम् ।।

A person who doesn't have mercy, respect for guru and elders, belief in religion, and who doesn't learn through life's experiences, we should never have such person as our friend.

गुणवज्जन संसर्गात् यातिनीचोपि गौरवम् ।
पुष्पमालानुसंगेन सूत्रम् शिरसि धार्यते ।।

If we have the company of a good person that raises the sense of pride in a human being as a flower when it gets stringed with thread, to form a garland that is so pure and can be offered to God**.**

उत्सवे व्यसने चौव दुर्भिक्षे शत्रु निग्रहे ।
राजद्वारे श्मशाने च यस्थिष्ठतिस भाम्धवः ।।

He is the true relative, who stays with us during the time of happiness, misery, confronting enemy, at the King's court and in the graveyard.

प्रथमवयसि पीतम् तोयमल्पम् स्मरम् तः
शिरसि निहितभारी नारीकेला नराणाम् ।
ददति जलमन ल्पास्वाद माजीविताम् तम्
न ही कृतमुपकारम् साधवो विस्मरम् ति ।।

A good person is one who never forgets a person who has helped in any way, big or small, as in the same way the coconut tree grows by absorbing small amount of water droplets but produces sweet water in much greater quantity than it has absorbed.

शोको नाशायते शौर्य शोको नाशयते सुखम्
शोको नाशयते सर्वम् नास्ति सोकसमोरिपुः

It is sadness or depression that destroys ones valour, happiness, and wealth, and everything else; hence, there is no enemy which is equal to sadness or depression.

New lessons were given to students only when the teacher was satisfied after a searching oral examination that the older lessons was thoroughly mastered. The education course concluded not by any lengthy and exhaustive examination, but by the pupil reciting and explaining the last lesson. At the end of his education the scholar was presented to the local learned assembly, where occasionally some questions were asked. This presentation took place when the *Samavartana* (convocation) ceremony was over. The eligibility of a student for *Samavartana* or receiving the degree did not depend upon the opinion of the assembly, but upon the opinion of his teacher.

Passing examinations and getting degrees, which dominate the present system of education, hardly played any part in ancient India. It was not the allurement of the degrees or the prizes but the thirst of knowledge or the desire to preserve the national heritage, which was the main spring of the educational effort and activity.

The absence of annual examinations with prizes and scholarships for the top boys naturally kept the element of competition within proper limits. Bright and promising students were however selected as monitors and entrusted with the teaching of the lower classes. So they also got their reward.

अजरामरवत् प्राज्ञाः विद्यामर्थम् च साधयेत् ।
गृहित इव केशेषु मृत्युनाधर्मा माचरेथ् ।।

A wise person should acquire knowledge and wealth thinking as if old age or death do not conquer him. But, he should follow the path of righteousness (*dharma*) thinking as if Death is sitting on his shoulder and is pulling his hairs.

गुरवो बहवः संति शिष्यवित्ता पहारकाः ।
गुरवो विरलाः लंति शिष्यह्रत् तापहारकाः ।।

There are many teachers in this world who snatch or seize the wealth of the students. But, there are true preceptors who are very rare and could only disentangle the miseries of the pupils originated from their minds.

सर्वषांचाधिकारोविद्यायां ।
परंच श्रेयः केवलाया विद्याया एव् इतिसिद्धम् ।।
(तैत्तरिय भाष्य – 1–11)

Everyone has the right to education; even the most sacrosanct '*moksha*' can be attained only by acquiring knowledge. (*Taittiriya Bhasya* 1-11)

PARAMARSH — AN INITIATIVE INSPIRED BY THE ANCIENT WISDOM

Preamble

In India, the place of a guru, the teacher, has been considered as the highest of all; it has been well described in the following *shloka*:

गुरुर्ब्रह्मा ग्रुरुर्विष्णुः गुरुर्देवो महेश्वरः ।
गुरुः साक्षात् परं ब्रह्म तस्मै श्री गुरवे नमः ।।

The guru is Brahma, the guru is Vishnu, and the guru is Shiva; guru is the embodiment of the eternal Brahman; to that guru I offer my obeisance.

The *guru-shishya parampara*, the teacher-student tradition or lineage, has been the most ancient and is also known as the best system. From the times of the Vedas, education has been given by the guru orally which is known as *guru-mukha*. The student while living in a *gurukula* would offer his services to the guru and at the same time, live a stringently disciplined life, with an extremely modest lifestyle, and perpetually practice whatever teachings the guru has given. Learning by heart was the only way to receive knowledge.

The word guru (Sanskrit: गुरु), connotes 'teacher' in Sanskrit, but in the Indian traditions it has contextual meanings with a far deeper significance than what 'teacher' means in English. The guru is much more than one who only teaches a specific type of knowledge. He is "friend, philosopher and guide", a counsellor, a 'parent' of the mind and soul; one who helps to mould values and experiential knowledge as intensely as any specific knowledge. A guru is an exemplar in life, an inspirational source, and one who reveals the meaning of life.

गुशब्दस्त्वन्धकारः स्तयात्रुशब्दस्ततन्निरोधकः।
अन्धकारन्निरोन्नध्वात्गुरुर्यन्निधीयते ।। 16 ।।

The syllable 'gu' means darkness, the syllable 'ru', one who dispels; because of the power to dispel darkness, the guru is thus named.

(*Advayataraka Upanishad*, Verse 16).

In ancient times, students lived in the house of the guru and acquire knowledge traditionally. This system is called *gurukula* system of learning. The meaning of *gurukula* is, "learning while living with the guru in his house."

After the full obeisance to the commandments of the guru, the student would pass the final test for learning only after the complaisance given by the guru. After this test the guru would grant knowledge with an open heart to the student and also take full responsibility of the student's future. Along these lines, as they spent most of the time together both the guru and the student had suavity and intimacy in the relationship between them. The guru took no fees from his *shishya*. The student's devotion towards his guru was what the teacher always cherished. In ancient times, therefore, education was entirely dependent upon the guru. There was no syllabus and neither there was any provision to write the notations of the *bandish*es (compositions) learnt. The student would try to imitate and repeat in exactly the same way as rendered by the guru.

This great tradition of the *gurukula* system practices the disciples going to the hermitage or *gurukula* where students not only got knowledge of various domains but also learnt life skills by rendering services in the *gurukula*. An acharya of the Indian system believed in imparting and disseminating knowledge in religious matters to his disciples through continuous interactions, deliberations, and discourses. The acharya disseminated knowledge and skills but the guru played the role of a mentor.

The acharya, over a period of time, played the role of a friend, philosopher, and guide to the disciples and nurtured skills and values necessary for life in the disciples. The guru ensured systematic grooming, handholding, and mentoring of the disciple and it resulted in holistic development of the disciples.

ॐ सह नाववतु ।सह नौ भुनक्तु । सह वीर्यं करवावहै ।
तेजस्वि नावधीतमस्तु मा विद्विषावहै । ॐ शान्तिः शान्तिः शान्तिः ।।

(Kathopanishad)

May Lord Brahma take care of both of us (guru and *shishya*) in the same way; may he provide us with the same knowledge and food; may he provide enough power of understanding to grasp knowledge, May the knowledge be for both of us and be a success; may there be no differences, hope the three spheres be in peace.

ANCIENT MENTOR- MENTEE CONCEPT

In the same way, higher education institutions in Takshila and Nalanda were a matter of envy and focus for replication for other countries. The quality of higher education in Takshila and Nalanda has been aptly acknowledged by

foreign travellers in their travelogues. There were more than 10,500 students from all across the globe to study a range of subjects such as the Vedas, grammar, philosophy, Ayurveda, politics, surgery, archery, warfare, music, and dance. Students from Japan, China, Tibet, Korea, Persia, Indonesia, and Turkey came to Nalanda to study the host of subjects.

There were other famous Universities as well in ancient India, including Vikramashila University, Valabhi University, Pushpagiri University, Odantapuri University, and Somapura University . These ancient centres of learning provided a rich tradition for mentoring and handholding, which was the crux of the quality and excellence that was evident not only in those institutions but also among the stakeholders of these institutions, be it the teachers, students, or their contributions.

तद्विद्धि प्रणिपातेन परिप्रश्नेन सेवया ।
उपदेक्ष्यन्ति ते ज्ञानं ज्ञानिनस्तत्वदर्शिनः।।

(*Bhagavad Gita* Chapter 4, *shloka* 34)

Seek knowledge by prostrating yourself, by questions, and by service; the wise, the knowledgeable, who has realized the truth, will impart that knowledge to you.

Herein implied is the attitude of the seeker — humility along with the freedom to ask questions with the offering of service. With this, faith in each other is also important. Education was extremely transparent in the Vedic Age. Questions could be asked as many times as needed. Education did not seem a burden.

PARAMARSH SCHEME OF UGC

The UGC launched an innovative initiative, Paramarsh. This initiative aims at improving the overall quality culture among higher education institutions (HEIs) in the country. The scheme intends to identify well-performing institutions and institutions that hold a considerably good grade as awarded by the NAAC ('A' and above letter grade). Such institutions would be assigned as Mentor institutions and unaccredited institutions would then be the Mentee institutions. Over a period of time, the mentor institutions will collaborate with the mentees and develop quality urge, quality culture, and quality synergy in the institutions by putting systems in place, building quality culture, develop the necessary policies and procedures as a prerequisite of the assessment process by NAAC.

The innovative Mentor System, Paramarsh, aims to not only benefit the mentor and mentee institutions through financial assistance, but the lakhs of students who are the stakeholders of these institutions. More than 3.6 crore students pursuing higher education in these institutions are the ultimate beneficiaries. Through this scheme the UGC and NAAC intend to complete the accreditation of all the tertiary institutions by 2022.

Paramarsh: Aims and Objectives

- Training of faculty and staff for proper process, documentation and presentation
- Sharing of knowledge, information and resources
- Opportunities of research collaboration and faculty development
- Guidance and encouragement to institutions to adopt the best practices.

Benefits for the Mentees

- Brings about the enhancement in the overall quality of the mentee institutions
- Enhances the profile of institutions as a result of improved quality of research, teaching and learning methodologies
- Receives support in the professional development of academics and/or increased exposure and speedier adaptation to best practices — Advantage point in *National Institutional Ranking Framework* (NIRF) and NAAC Accreditation.

Benefits for the Mentors

- Additional learning acquired from experience
- Intellectual challenge of working in different environments
- Opportunities for increased collaborations
- Satisfaction of helping others and seeing them succeed.

गुरु गोविन्द दोऊ खड़े , काके लागूं पाए
बलिहारी गुरु आपने , जिन गोविन्द दियो मिलाए ।
ज्ञान प्रकाशि गुरु मिला, सो जन बिसर न जाए जब
साहिब कृपा करि, तब गुरु मिल आए।।

God and teacher are both standing side by side, to whom I should turn for blessings? It's the teacher whom I should first venerate as he made me aware

of God! The guru gave me the light of knowledge, that I must never forget; When there is God's Grace, then alone can one get a teacher.

ग्धेन धेनुः कुसुमेन वल्ली शीलेन भार्या कमलेन तोयम् ।
गुरुं विना भाति न चौव शिष्यः शमेन विद्या नगरी जनेन ।।

Just as a cow without milk, branches without flowers, wife without character, water without lotus, knowledge without peace, and a town without people do not glorify; in the same way disciple without guru does not glorify or succeed in life.

The UGC intends to change the ecosystem of quality in higher education through various initiatives and support systems and Paramarsh is looked at as an initiative inspired by the ancient wisdom of India, which believes in continuous interaction between the mentor and the mentee. The mentor makes many advantageous points in favour of the mentee by providing, knowledge, skills, and correct attitude in the mentee. Working on the system of "hub-and-spoke", the mentor called the hub is centralized and will have the responsibility of guiding the mentee through the secondary branches or the 'spoke'.

Through various interventional strategies, the mentor institutions would 'handhold' the mentee institutions by providing model, support, information, and a network of best institutions and their practices. As part of this scheme, a pool of resource persons would be identified and would be roped into provides the operational support and deployment strategies of the quality achievement, sustenance, and enhancement scheme.

CONCLUSION

The objective under the Paramarsh scheme is as in the ancient tradition; just as the guru identified the capability of his students and accordingly imparted knowledge. The students learnt the Vedas and the shastras amidst the natural surroundings of the *kula* or ashram, in open air, in close contact with nature. The purpose of the *gurukula* was for the student to live with the guru in his ashram, until he had gained a thorough knowledge of the three Vedas (*Trayi*). The *gurukula* system of education was dedicated to the highest ideals of all-round human development — physical (practical), mental (intellectual), and spiritual (religious) knowledge leading to God-realization (*Brahmasakshatkara*). The system was based on the principle, "Experience (*anubhava*) is the best teacher." At the end of their training, the students emerged as responsible

individuals who were well-versed in the Vedas and capable of facing the toughest challenges of life.

In much the same way, leading institutions will provide regular mentoring to help other HEIs to achieve high quality standards. The Paramarsh scheme would help mentee institutions in their overall development to achieve higher quality standards. Giving them financial assistance and helping them to get accredited by NAAC, and focusing on the holistic development by ensuring the sharing of knowledge, providing information and opportunities for research collaboration, and development of faculty would all ensure a healthy *parampara* between the mentor and mentee institutions.

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CAPACITY BUILDING OF TEACHING FRATERNITY AND QUALITY IN INTERNATIONALIZATION

H. Vinod Bhat*

INTRODUCTION

Internationalization of universities is a strategic priority today. The international nature of universities is not a recent characteristic of higher education. Mobility of scholars across national borders has existed for centuries. However, what has changed is the extent to which higher education institutions (HEIs) engage in international activities today. A cursory glance in the European Higher Education Area (EHEA) reveals that national Higher Education Systems (HESs) are caught up in a conundrum of moving towards harmonized educational structures and maintaining heterogeneity of their systems. Quality assurance is one such area which sheds light on the converging and diverging trends of higher education in the European context (Loukkola, 2012).

The conspicuous change in the role, function, and purpose of higher education in society is a testimony to the impact of globalization on social institutions of the world. While internationalization of higher education is characterized by developing cooperation and growing competition, the pressures of globalization have altered the organizational motivations, structures, and strategies of HEIs.

Student mobility, staff exchanges, or research collaborations have always remained integral to the understanding of the internationalization of higher education, but mobility and exchanges are only some of the facets of international cooperation between universities. The emerging areas of research in the field of internationalization of education have been inclusiveness and diversity in education, ensuring quality in the processes of internationalization and building sustainable synergies and resources to create global citizens for future of the world. The predominance with rankings, preoccupation with international education, diversification of education providers and funding mechanisms, and the growing dominance of English as a medium of instruction, are some of the realities of the international education landscape.

As universities strive to integrate a global approach in their systems, it is equally important that HEIs attend to quality assessment and assurance. It is pertinent to understand how an international approach of universities

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enhances the quality of education, and how refined quality of educational services may positively impact the extent of internationalization in university campuses.

While mobility of scholars has existed for centuries, the trends in higher education have undergone changes. One of the changes is the growing emphasis on quality with regard to improvement of education services and accountability. Amidst the ambiguity of detailing the international standards, some of the motivations of internationalizing higher education have been pointed out to be improving quality and teaching in universities (de Wit and Knight, 1999).

We are exploring here the connect between the internationalization of higher education and quality, and vice versa and bringing out some of the key elements involved in quality assessment influencing internationalization. The role of international faculty and their possible contributions to internationalization of universities is highlighted. Finally, the challenges and concerns pertaining to quality assessment are also discussed.

INTERNATIONALIZATION OF HIGHER EDUCATION

Internationalization of universities has become integral to higher education. Universities across the world are caught in a conundrum of maintaining their unique as well introduced harmonized structure of education. The forces of globalization have mounting demands on HEIs, which have compelled the universities to devise distinct innovative strategies for internationalization. The universities, unique in their own ways, are in pursuit of competing with the global pressures and stand out from rest of HEIs. Therefore, universities are bestowed with the important role of being learning centres, which can inculcate values of the 21st century, skill sets required to meet global industrial demands, and create global citizens who can adapt to different teaching and learning styles as well diverse cultures.

The different trends and pathways have been observed in the internationalization of higher education, as a response to globalization. These include the growing trends in internationality, mobility of students and faculty, international collaboration between universities, organizations, and formation of different institutions are a reality in higher education landscape. Similarly, cross-border delivery of education in the form of distance education, virtual universities, and an increase in the entry of HEIs from the developed to developing countries have been some of the other key trends (Powar, 2001).The organizational

realities and the contextual environment guiding higher education is distinct in the Indian context. The juxtaposition of the performance of the European HEIs and those of the Indian ones, reveals that rankings and reputation have played a distinct role in both the contexts. While a few universities in Europe and the United States comparatively made sustainable efforts towards internationalizing, the Indian counterparts are in the process of making their global presence felt**.**

Internationalization of higher education has gained precedence in the global higher education space. The mobility of scholars across borders has increased and universities are constantly developing and revising their internationalization strategy. The coordination and dialogue among different stakeholders within higher ecology such as universities, government bodies, regulatory agencies, accreditation agencies, and funding agencies is crucial in enhancing the growth of higher education in the society. Internationalization of higher education has had considerable research emerging from different regions of the world focusing on different pathways to internationalization. While some scholars argue that internationalization is a response to globalization, there are others who view internationalization and globalization as distinct processes.

The processes of globalization and internationalization of higher education both acknowledge: firstly the dominance of knowledge society involving participation of multiple stakeholders in the higher education ecology; and secondly the changing contexts with regard to international higher education landscape (Knight 1996; Scott 1998; Teichler 1999; Van der Wende 2001). However, the processes of the internationalization and globalization of higher education differ with respect the role of national borders in the domain of higher education. Internationalization of higher education may involve cross-border activities pertaining to higher education amidst moderate or stronger presence of national borders, on the other hand globalization is concerned with blurring of national boundaries with regard to delivery of higher education. Similarly, the internationalization of higher education involves concepts such as academic mobility, research collaborations, branch campuses among other (Teichler, 2004). The process of globalization emphasizes the market-driven approach or commercialization in cross-border higher education, transnational education, and so on (El-Khawas 1994; Lenn 1999; Middlehurst 2000; Sadlak 2001).

The internationalization and globalization of higher education are complex processes involving overlap of activities and therefore it may not always be

possible to make categorical distinctions between the two (Scott, 2005). Altbach, *et al.* (2009) contend that globalization has been shaped by multiple factors such as knowledge economy, role of English as the medium of instruction, role of information technology among others, whereas the internationalization of higher education is also concerned with policies and programmes. Amidst understanding the complexities involved in internationalization, Knight (2008a) acknowledges internationalization of higher education is getting increasingly complex in scope and importance.

The institutional effectiveness could be enhanced with regard to internationalization by means of various approaches and facilitating capacities to carry out international activities (Davies, 1992; Schechter, 1993; Van Damme, 2001). Knight (1999) highlights different approaches which universities may take up in order to enhance internationalization.

- The activity approach is concerned with individual activities rather than perceiving internationalization process as a whole.
- The competency approach is concerned with the learning outcomes of the students. The components within competency approach may involve language and inter-cultural proficiency tests.
- The ethos approach focuses on the cultural elements and values of the institutions.
- The process approach involves approaching international activities which includes organizational structures, vision and mission of the institution.

The quality assurance systems could include a process approach concerning accreditation, rankings (Knight, *et al.*, 1999; Van der Wende, 1999). Another approach to evaluate the institutional effectiveness is the approach of ranking of universities. This involves evaluating the performance of universities according to predefined criteria.

Internationalization of higher education is defined as "process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of post-secondary education" (Knight, 2003, p.2). Moreover, the key aspects of internationalization abroad and internationalization at home as stressed by Jane Knight (2008a) points out to different ways in which universities seek to reach out to the larger student community across the world. Although different organizational and external factors may affect the extent of internationalization of universities, the extent of internationalization abroad, amidst cooperation and cooperation is expected to grow. The cross-

border education including credit mobility programmes, student mobility or establishment of branch campuses are a part of "internationalization abroad" (de Wit, *et al.*, 2015). On the other hand, internationalization at home has been understood as the inclusion of international and intercultural dimensions into the curriculum so that students at the home institution could benefit from an international experience (Beelen and Jones, 2015).

QUALITY AND INTERNATIONALIZATION OF HIGHER EDUCATION

Since the 1990s, the extent of scrutiny and monitoring of performance of universities has been a conspicuous feature of the changing landscape of higher education. The evolving policies in the domain of higher education have led governments to engage in the assessment and supervision of the quality of HEIs. The aspects of accountability and quality assurance are some of the key trends observed in higher education post the 1990s (El-Khawas, 2007). Quality assurance refers to the process of HEIs responding to an external scrutiny and these HEIs providing assurance that education at the respective institutions makes valuable contributions to the society and is committed to societal development (*ibid*).

While national governments seek to invest in higher education and the importance of funding has been recognized as a crucial factor, in the context of quality of education it is important to ponder whether the HEIs are operating efficiently and if they are able to produce graduates suitable for society. The idea of quality has been conventionally understood as excellent performance. In the past few years, as the understanding of quality in the domain of higher education continues to evolve, quality essentially refers to defining the purpose (of the institution) within the mission and objectives of the institution (Woodhouse, 1999). This definition leaves room for diversity across institutions and for recognizing the influence of culture in attaining quality.

It is important to dwell on the reasons for public attention to quality assurance systems in the field of higher education post the 1990s. A few of the external developments in the higher education milieu caused an attention shift towards enhancing quality of HEIs. The growth in enrolment, expansion of public HEIs, the rising cost to the government owing to the rise in enrolment numbers at the institutions were some of the influential forces (Bleiklie, 1998; Kogan, 1986; Pollitt, 1993). The pressures arising from growing enrolment numbers

at HEIs were felt by both the developed and developing nations (El-Khawas, 2002; Salmi, 2002). As a result, some of the HESs became more effective, came under more scrutiny of the external agencies for quality assessment, subjects of dipped government. In this context, adaptiveness and entrepreneurship were some of the responsive trends on the part of universities (Clark, 1998; Sporn, 1999).

As a result of the fall of the iron curtain and new European Commission policies in higher education, also prompted a few changed in the European higher education space. The Erasmus programme or the growing emphasis on academic mobility also spurred changes in the European policies in academic programmes in European countries. The quality assurance systems were given different mandates with different rationales and approaches to quality assessment (El-Khawas, *et al.*, 1998; Harmon, 1998). While some agencies may have large responsibilities, others may not have broad mandates.

The quality of HEIs and the reputation of Indian universities have been discussed for decades. The process of quality enhancement of education reflects in the university's position in the ranking. The quality of an institution may refer to the quality of some of these crucial elements at HEIs:

- The students
- Level of teaching
- The faculty and its contributions
- Research produced
- Services provided to the students and faculty
- The processes and organizational practices in place
- Organizational and external environment with regard to safety and security of the educational space
- Education at the institutional and national level
- Vision and objectives of the university
- The curriculum
- Quality assessment tools

Similarly, the process of assessing quality of the internationalization may require laying out clear objectives and targets, which would provide a realistic scenario of the strengths of a university as well as look for areas for improvement

(Knight, 2008b). It is important for institutions to engage in ongoing review and not vague description of what internationalization entails, which would help the institution evaluate the outcome of the internationalization activities. According to Knight (*ibid.*), it is important to include a tracking measure instead of performance indicators, which would help the institutions to keep a record of the progress rather than the output.

***External Quality Review (EQR)*:** External quality review is a national, international, and institutional need. The EQR agencies are in charge of seeking accountability from HEIs for the resources utilized and to help universities improve their quality. Quality assurance refers to the policies and practices in place to make sure that quality is maintained and achieved in respective HEIs (Woodhouse, 1999). The approaches to quality include audit, assessment, general accreditation and professional accreditation.

Audit: Audit refers to checks on whether the institutions are delivering what they claim to achieve as objectives. Audits are sometimes referred to as review. The process of audit may include suitability, conformity, and effectiveness of the activities. Assessment, also known as evaluation, involves a grade in form of numeric or descriptive analysis. The objective of assessment is to gauge the quality of the outputs of institutions, which leads to the recognition of how 'good' as a relative concept. The difference between an audit and assessment lies in the output, while the output of former is descriptive, assessment may yield grade (*ibid.*). Accreditation is concerned with determining whether a particular institution deserves to be given a particular status. The process of accreditation addresses the issue of whether the HEI is suitable to be approved in a particular category. Therefore, while accreditation and assessment may focus on similar outputs, the processes leading to those outputs are different.

***Benchmarking*:** Benchmarking is another approach to assess the quality of internationalization. Benchmarking is a process, which involves comparison of performance with others, identify strengths and weaknesses, and devise practices aimed at improvement (Schofield, 1998; Fielden, 1997). Therefore, benchmarking could imply different meanings in different contexts, not necessarily referring to the 'best': practices that are world class, practices that have been successful, and practices that have a minimum acceptable standard. These three interpretations point out that the tendency to implement benchmarking is with regard to comparison, which need not be restricted to comparison with the best (Bolton, 2000). The objective of the benchmarking activity is

improvement, involving a list of indicators. Moreover, benchmarking involves recognition and comparison of best practices across different contexts.

There are different types of benchmarking, such as internal benchmarking, which involves comparing different components within a university and does not involve an external agency. External competitive benchmarking, external collaborative benchmarking, and external trans-industry benchmarking are other types of benchmarking measures undertaken by institutions (Alstete, 1995).

The rise in the international academic mobility and massification of education have brought out the significance of benchmarking and performance indicators, while evaluating the performance of universities. The mutual academic recognition is not only an acknowledgement of the learning outcomes of the study programmes but students' academic qualifications need to be recognized by the professional bodies and employers in the industry. Washington Accord (an international accreditation agreement) is one such example, which uses the principle of benchmarking in its process of accreditation of engineering programmes (Powar, 2002).

Quality review may involve devising instruments, which have different purposes and have measurable objectives, which could serve as benchmarks and also permit benchmarking. The element of context is crucial in defining the indicators and relevance of the indicators prescribed in quality assessment (Joris, 2008). An overview of elements included resources, researching findings, commitment of the institution, objectives and strategies of internationalization, study programmes, international reputation, context among others (de Wit, 2010).

In the context of Indian higher education, there is a need for systemic overhaul. Some of the pathways of creating change are faculty development programmes, orientation courses for students, elective courses for students, having semester pattern for conducting classes could be instrumental drivers in creating a sustainable change (Jayaram, 2011).

Accountability is concerned with laying out obligations for HEIs, which are relevant to performance of the universities or financial accountability on the part of institutions. Accountability is concerned with improving the institution's performance (Powar, 2002). Academic accountability is concerned with enhancing the competitiveness of the study programmes; administrative

accountability deals with managerial functioning of the university and ensuring that the sub-systems and the system as a whole are functioning smoothly. Financial accountability is keeping clean records of utilization of resources.

In the context of building sustainable and quality HEIs, it is important to build well-functioning supportive systems for internationalization. The extent of international cooperation and exchanges between institutions are influenced by the support services and resources provided at the institutional level. In the Indian context, resources for research and enabling infrastructure have been some practical challenges in enhancing the attractiveness of the Indian institutions (Sharma and Sharma, 2015).

Therefore, it is crucial for universities to have processes and practices in place and ensuring that an international outlook exists within different departments of the universities. The institutional readiness, infrastructure with excellent quality, ensuring safety and order in university campuses, medical facilities, hostel facilities, starting remedial courses for students, as well as smooth registration procedures for foreign national are some of the prerequisites for boosting the international prospects of a university (Altbach and Mathews, 2015).

In the context of the international higher education landscape, the process of quality assessment is complicated. For instance, a few decades back in the United States, setting up overseas branch campuses had raised a few concerns. While the regional agencies would have their teams visit the institutions, it was felt while similar factors influenced accreditation by these agencies, the approaches followed by these regional agencies were different; which posed questioned the effectiveness of the process of quality assessment carried out by these agencies. Moreover, when an institution in a country Y establishes a branch campus in country Z, it is important to determine whether the regulations of country Y would be applicable to the quality assessment of the institution in country Z. Another challenge is the multiple review processes, which tends to occur in case of cross-border higher education. In the context of cross border higher education, there are different agencies in Europe working on mutual recognition of the academic work done by the students in the host university.

With regard to recognition, issues such as standard, autonomy, ownership need to be addressed. While quality remains integral to teaching and research, it is equally essentially to maintain standard and with regard to mutual recognition, it is important to acknowledge whether the graduates from both the institutions

are at the similar standards. Like institutional autonomy, academic freedom is important to encourage better performance and involvement of teaching members in the processes and practices of the universities (Woodhouse, *op.cit.*).

The organizational strategies for the internationalization of universities brings out the element of operations, which further highlight the importance of quality review (Knight 1994; Knight and de Wit, 1995). There has been considerable literature, which traces the developments in quality assurance below the Bologna Process pertaining to higher education in European countries. Some drivers such as massification, privatization of higher education, or fall of the iron curtain pushed for establishing quality assurance systems in Europe.

In the European context, in order to review the process of internationalization, some initiatives such as Internationalisation Quality Review Process (IQRP) by IMHE/OECD (de Wit and Knight, *op.cit.*), or Mapping Internationalization (MINT) mechanism by Nuffic (2014), or "Certificate for Quality in Internationalization" by the European Consortium for Accreditation have been established in the past few years address the issue of quality assurance in internationalization.

The Finnish HESs have made efforts to enhance quality of higher education. After the education reform in 2010, the focus of the universities has been to improve the quality of the doctoral programmes. Similarly, the internationalization strategy by the Finnish government focuses on increasing the quality and attractiveness of the Finnish universities. While the transition from the focus on quantitative output to emphasis on quality may have been slow, today Finnish universities have excellent infrastructure and well-established quality assurance systems in place similarly, the "German Excellence Initiative" aimed at enhancing the competitiveness of the German higher education system has had tremendous impact in improving quality, promoting research and strengthening internationalization in German universities (de Wit, *et al.*, 2015). The Finnish and German case studies suggest how it is important to make crucial policy recommendations and include enhancement of quality of internationalization in the national agenda.

PURSUIT FOR QUALITY IN THE INTERNATIONALIZATION OF HIGHER EDUCATION

The pressures of globalization, regional cooperation between universities, as well as increasing academic mobility have compelled for greater scrutiny of

the HEIs. The aspect and importance of quality assessment of universities has been recognized in most part of the world. The growing emphasis on outcomes of study programmes or higher education which reflect if the students have mastered the objectives laid out in specific cases (Altbach, *et al.*, 2009). The aspect of quality in an international credit mobility experience is important for building sustainable cooperation. The quality in providing information about the study abroad opportunities, quality of the support services, and recognition of relevant learning outcomes from the mobility abroad are some of the key issues to be paid attention to. Similarly, the growing importance and shift towards starting English-taught programmes raises the question on the academic quality of the programmes taught at the respective universities. In this context, it is important to attend to important questions such as, which programmes should be taught in English and the motivations of starting English-taught programmes (de Wit, 2010**).**

With regard to branch campuses, there have been issues concerning quality, for instance the lack of involvement of the awarding institutions may affect the quality of education (Altbach, 2012).

The internationalization of home facet strives to build intercultural competencies amongst students, enhance employability skills as well as improve quality of the teaching and learning endeavour of faculty and students (Jones, 2014).

As HEIs continue to engage in international cooperation, they are driven by different motivations and approaches while engaging in international activities. It has become far more important to ensure that the quality of the programmes delivered is assessed in terms of their effectiveness and achievement of the learning outcomes (Deardorff *et al.*, 2009). Therefore, it is imperative to ensure that the quality of the study programmes as well as the certifications accredited to universities are well monitored. The quality of higher education is often influenced by the extent of internationalization. The aspect of accountability of student, teachers as well as management of universities have been crucial in higher education. In this context, quality assurance, benchmarking, auditing, and certification issues are important in integrating quality issues in the internationalization of higher education. Some of the key initiatives, such as IQRP focused on organizational and programme strategies, progress and quality and the process of evaluation rather the outcomes. The involvement of leadership, teaching faculty, and students is an important part of IQRP (Knight, 2008b).

The feature of diversity needs to be addressed in the context of quality assessment of the internationalization of higher education. Given the diversity in the types of institutions, the programmes offered at these institutions, their size, the internal and external environments encompassing the institutions, one common assessment tool would be an impractical remedy. Therefore, it is pivotal to take into account these systemic distinctions as well contextual realities guiding the functioning of HEIs. The quality assurance needs to answer questions such as why are we engaging in this activity, the processes involved in the implementation and objectives of the quality assessment processes (de Wit, 2010).

Some key observations with regard to quality assurance in higher education are the need for quality assessment, which involves input and output assessment, inclusion of benchmarking to create standardized practices, and carrying out quality assessment at the institutional level. With regard to the institutional participation in quality assessment processes, there are times when universities may find the processes time consuming. Besides, given the nature of assessment, the assessment of institution's practices may not address the diversity and nuances of these organizational strategies. Moreover, a minimum requirement of internationalization could cater to all programmes and students, and the maximum range may include comprehensive international and intercultural elements. One of the ways to grapple with the complexities in quality assurance could be to devise assessment tools, which are programme specific. In this context, it is important to mention how internationalization within an institution positively influences the overall quality of study programmes offered. Similarly, it is vital to have a well-drawn vision for internationalization of the programme and translating this vision in the learning outcomes of each of the prescribed programmes.

Some of the initiatives taken up at the European level such as "bottom up" initiative includes consortia of different quality assurance agencies or international organizations. As the mobility of scholars continue to rise, the role of professional organizations is crucial in enhancing quality and mutual recognition of the academic and professional qualifications. The international accreditation practices have also been strengthened with the increase in professional organizations. While the regional accreditation agencies seem to rise, global accreditation might be a trend in the near future (Van der Wende, 1999).

CAPACITY BUILDING AND THE ROLE OF INTERNATIONAL FACULTY

Jane Knight's (2008a) definition about internationalization of higher education points out that internationalizing university campuses essentially involves adding a global dimension or an international outlook to teaching, research and services at HEIs. The inclusion of a global perspective into university campuses may reap long-term benefits for students, faculty, and HEIs as whole. The embeddedness of internationalization in the sub-system of a university structure may enhance competitiveness among students, provide faculty members with different insights in their disciplines as well as enhance the international presence for the institutions (Sanderson, 2008; Stromquist, 2007).

Collaborations with highly reputed national and international HEIs may result in quality, reputation and credibility of the student exchanges and academic cooperation (Sharma and Sharma, *op.cit.*). At the same time, it is important build quality engagements between academia and industry. It is important to consistently engage in revising the curriculum content according to the trends in the socio-economic world (*ibid.*).

A truly internationalized curriculum focuses on teaching and learning strategies aimed at creating graduates who manifest global approach as working professionals. The teaching and learning tools could include international content within their strategies as well as shape intercultural communications skills, which enable the graduates to effectively function in a diverse working environment (Leask, 2001).

As students remain the core stakeholders in higher education, it is pertinent to address the concerns and demands of the international students. Some of the factors, which distinguished the Indian universities and institutions from the developing world from a considerable part of institutions of the western counterpart are the issues of faculty quality, resources on board and an internationalized curriculum across different tier institutions within the country. The enabling support services and infrastructure, student-centric approach to learning in the United States and Europe (Schulz *et al.*, 2007). Although international partnership and exchange programmes have been driving internationalization in India, the emphasis on enhancing the student experience has not gained traditionally gained attention in the Indian context (*ibid.*).

Developing research collaborations could be viewed as a pathway to deeper international engagement between HEIs. While the developing nations may view research collaborations as a way to learn about innovative advanced developments in the developed world, the universities from developed countries may find building research collaborations of orienting themselves to social and contextual realities of the developing world (Powar, 2002). In the Indian context, HEIs, in their quest to perform well in world university ranking, grapple to build a sustainable reputation and research output. Some of the initiatives launched by the government of India such as the mission launched after the name of Pandit Madan Mohan Malaviya, to enhance the professional development of the teachers, designing curriculum content and advanced pedagogical tools for teachers (Sharma and Sharma, *op.cit.*).

The Global Initiative of Academic Networks (GIAN) aims at enhancing the standards and quality, and increasing the attractiveness of Indian HEIs. Initiatives such as Impacting Research Innovation and Technology (IMPRINT), GIAN, and Uchchtar Avishkar Yojna (UAY) point to India's willingness and vision of augmenting the research culture in higher education as well as encourage scholars to engage in quality research. Besides, acknowledging quality institutions as institutes of eminence is yet another motivating step by India to enhance institutional autonomy, offer quality study programmes and launch offshore campuses. The Study India Programme (SIP) is another encouraging initiative launched in India to enhance the attractiveness of Indian institutions and encourage international students to take up courses on Indian history, Indian culture, Indian languages and so on, in India. Although effective implementation of SIP would involve having a long-term vision and conducive infrastructure in place, SIP could indeed be a driver for institutions to better than internal systems to attract international students and academic collaborations (Powar, 2002).

An international experience plays a crucial role in the personal and professional development of individuals. Exposure to different learning styles, academic environments, pedagogical methods as well as working culture may contribute to inter-cultural sensitivity and cross-cultural acceptance. In this context, an international experience for a student can be extremely educative. A stint abroad provides students with the required exposure and opportunities to interact with other students, learn about new cultures, societal practices, traditions and other learning styles.

The presence and participation of internationalizing faculty in university campuses could indeed be crucially instrumental to the process of internationalization of higher education. Just as having international students may enhance the attractiveness of individual institutions. Similarly the role of international faculty and their contributions could be pertinent to the extent of internationalization of a university. Although research and statistics about international faculty mobility trends have been limited as compared to research on international student mobility, it is equally important to really understand what an international faculty means — whether it is the citizenship of the faculty member, which becomes relevant, or the experience/training abroad of the faculty member, or there are other perceptions of an international faculty member in university campuses. Though there is hardly any common definition of an international faculty, it is interesting to note that faculty members are crucial stakeholders in three pathways to internationalization: student mobility, research and innovation, and international collaborations of the universities (Rumbley and de Wit, 2017).

The recruitment of international faculty on board is also relevant to the type of HEIs. Top research institutions are able to perhaps the best academicians and scholars in the field, while the developing universities struggle to recruit best long-term international faculty (*ibid*.). The national, institutional and external context play a role in international faculty's decisions in being mobile and in associating with a university abroad. The recruitment of international faculty is influenced by an array of factors, such as, the employment conditions of the host university, the policy framework, geo-political situation, and the status of the country among many other factors (*ibid*.).

The presence of international faculty on board or teaching faculty members with an international experience may have underpinning on the quality of higher education. An experience abroad for a teaching faculty may involve training in different working culture, interaction with diverse faculty members and student communities, orientation to innovative pedagogy and new teaching styles. Similarly, the presence of international faculty may open the scope for interesting dialogue between the students and faculty and amongst the faculty members, thus resulting in diversity of views and perspective of global problems. Therefore, if out of a total of 1000 teaching faculty, even if 50 members have had international academic experience, it may indeed be valuable to the growth, quality, and reputation of the university. While an international academic experience may facilitate cross-cultural learning, it

may also result in faculty members carrying their culture to the university campuses, exchange dialogue, and thus affect quality and diversity in the institution.

The existing faculty in HEIs could be equally motivated to engage in the international mobility experience and bring back new forms of pedagogy and perspectives to their research area. Similarly, the faculty members could be encouraged to participate in short-term or long-term exchanges, which would enable them to connect with scholars from their research domains as well as bring back resources to their home university in terms of new connections which they seek at the host university. With regard to recruitment of international faculty in the home university, international faculty could be hired for short-term engagements and long-term contracts so that they too have an intercultural experience from their experience abroad, so that students of the home university could attain new perspectives from their interactions with the international faculty and also contribute to the institution's reputation in international higher education landscape.

The need to enhance research output, address faculty concerns, and increase attractiveness of Indian HEIs has been deeply felt. The concern of the shortage of faculty in some Indian universities is grave and needs serious systemic attention. The perception that academia in India is poorly paid needs to be corrected and the vacant posts in some of the Indian institutions need to be urgently filled up. To enhance the quality of institutions within India, some of the possible recommendations may include, among others, making use of technology in classrooms, encouraging international engagements, strengthening research output, bettering institutional governance, long-term funding, and taking a close look at curriculum content (Kumar, 2018). With regard to quality of the teaching staff, it is important to create performance culture and take appropriate measures to enhance the professional development of the teaching faculty. International exposure for the faculty members would help develop their capacity, which would be instrumental in the development of the institution. International Faculty Development Programme (IFDP) could be one of the measures to facilitate cross-cultural dialogue between faculty members and the faculty could be sent abroad for sharing of best practices (*ibid.*).

An international academic experience for teaching members and students is indeed instrumental for an individual's and an institution's growth. The experience may also result in widening international cooperation through

interactions with counterparts from similar or different study fields, contribute to diverse research outputs, and enhance personal connections with colleagues in different institutions. For instance, participation in an international conference held abroad, may help people connect to with others, accelerate academic growth in their respective study fields and bring in new ideas to their host institutions. Therefore, as universities, it is important for the leadership and management to encourage staff visits, both long term and short term in nature, and faculty participation and involvement in international activities. The participation of faculty members from different institutions, within a university in different international events, may help them to connect with academicians in their study field and consequently work together in a research area or over research problem.

Closely related to faculty engagement in internationalization, is the aspect of internationalization of research in university campuses. In order to build effective synergies and rigorous academic culture, it is significant to have supportive mechanisms and conducive systems in universities. Similarly, an institutional policy mentioning research targets is equally important. Besides, short-term mobility visits for students and faculty and the inclusion of international element in teaching and learning would enhance the quality of research in university campuses. Support for research and development activities and dissemination of research projects and activities is essential for sustainable research outputs.

In the context of internationalization, like the teaching faculty, the training staff members too can learn from an experience abroad and universities need to make efforts, which would facilitate learning opportunities for the operative staff of the universities. For instance, an international office is instrumental in maintaining records of the incoming and outgoing mobility numbers, involvement in research projects, staff visits, training seminars, workshops and international conferences hosted and participated in by the home university. In this context, it is important that the non-academic staff participates in training programmes on internationalization where they can interact with staff members from other international offices, share their best practices, discuss their practical difficulties, and learn from each other's experiences.

The process of building international collaborations is guided by a range of organizational and environmental factors. Amidst these influential forces, the rationales driving internationalization of respective universities are unique. While universities find themselves competing with other universities in

the world internationally, the larger objective of developing international partnerships is related to building sustainable cooperation between the institutions as well as to learn from one another. One of the ways of improving the quality of an institution involves attempts at imitating or aping the best practices of partner universities and to introduce those practices at the home university if they are sustainable and aligned with the goals of the home university. The process of implementation of the best practices learnt may involve the proactiveness, participation, involvement, and commitment of different stakeholders within an institution. In fact, having made sure that the processes and relevant practices are in place, it may take time to carry out newer practices in the university. Therefore, although building cooperation and seeing sustainable results of cooperation may take longer, it is important that the concerned stakeholders make equally sustainable efforts in bringing about institutional change.

While various motivations drive international partnerships in academia, the quest for creating and enhancing diversity in education structures cannot be overlooked. The interaction between two cultures, or a dialogue between two students or two teaching faculty from different countries may result in diversity of perspectives. Therefore, the element of emerging diversity among HEIs is one of the drivers as well as results of international cooperation. The diversity may be in terms of the learning styles, the medium of instruction diversity in cultural practices, in teaching styles, in curriculum content, and in learning outcomes, among other facets of mutual academic exchanges.

As students and teachers remain at the forefront of universities, it is important to enhance the quality of learning and teaching at university campuses. Enriching the learning and pedagogy would influence the reputation and attractiveness of the university in the global higher education arena. The teaching faculty who have been trained abroad or have an international experience may be able to share their knowledge, expertise, attitude, and experiences with their peers and thus contribute to newer ways of learning in university campuses. Therefore, internationalization through the means of an intercultural experience or an immersion programme abroad may contribute to the amalgamation of cultures, and thus lead to overall enrichment of the individuals.

CHALLENGES TO IMPROVING QUALITY

Some of the practical challenges to the internationalization of higher education may also influence its quality. The massification of education, decrease in

public funding, lack of academic nimbleness, commercialization, and stringent consular issues have affected the internationalization of higher education. Some of the key phases observed in higher education in modern societies could be elite higher education, mass higher education, and universal higher education. As universities shift from one phase to another, expansion in the HES may enhance diversity of institutions, which may however result in greater costs for elite institutions, similarly the massification of higher education may have an impact on the quality and standards of education (Trow, 2010).

The development of quantitative matrix to determine quality of internationalization could be a tedious process. At the onset, it could be challenging for the institutions to design internationalization strategies, which relate how internationalization strategies would positively influence the outcomes and also formulate mechanisms in which core processes and inputs could be improved. Only having achieved these objectives, can institutions focus on measuring the success of internationalization (de Wit, *et al.*, 2015).

The smooth functioning of the higher education ecology includes clear understanding of the rationales and practices of internationalization in a particular context. Therefore it is important that the national HES as well as different stakeholders such as the government sector, education sector, and the private sector are aware of the motivations of each of the groups and address the diversity in these rationales, so that the heterogeneity in perspectives could be the means to cooperation rather than to conflict or competition (de Wit and Knight, *op.cit.*).

Challenges related to quality assurance include national and international recognition of providers and programmes. In some cases, the regulatory framework may not apply to providers outside the national systems. Some of the issues are how does one ensure the quality of the programmes offered by the private and public universities? And how do the regulators assess the quality of the students' achievements. Moreover, the accreditation organizations have started to become internationalized. In some cases, the organizations are more driven to better the performance of the universities than to enhance quality. Given the diversity in different HESs, would the nations be able to establish systems for incoming and outgoing mobility of the scholars?

The quality assurance systems for the programme providers are important for maintaining quality. While the delivery of higher education may be smooth in the national context, the cross-border delivery and assessing quality may

be a tedious task. In such a situation, the elements relevant to cross-border education such as differing curriculum, academic adaptation, and workload of the teaching members (de Wit, *et al*., 2015).

Establishing branch campuses, offshore campuses, joint degrees, or essentially subsets of transnational education, could be ways for the host universities to engage in international mobility, international identity, and access to high quality. In the Indian context, however, there are apprehensions regarding the motivations of establishing foreign institutions in India. Although the previous processes for collaborations between foreign HEIs and Indian universities were tedious, time consuming, and bureaucratic and involved application from the foreign institution, since June 2016 the stringent regulations were relaxed (Garrett, 2017). However, the apprehensions about the kinds of collaborations, which would be allowed still exist, as the option of offering joint degrees is not simple. One of the possible reasons for this reticence towards joint degrees could be the dependence on the regulatory framework rather than legal pathways where it is felt that the right to award degrees should be limited to Indian institutions in the case of an international collaboration (*ibid*.). Therefore, Indian universities seems to be in a tussle between innovation and regulation.

Because international cooperation and academic mobility are on the rise, apprehensions increase as some nations seem to benefit more than others. Given the current preoccupation with rankings, the competition between HEIs is likely to rise. Besides, the rise in the diverse range of educational providers including non-government bodies has led to questions of quality and standard. In this regard, the integration of education providers, the quality and recognition of qualifications earned could be questioned further. The issues of cost, quality, and access still plague the higher education landscape. While joint degrees and collaborative study programmes have been on the rise, integrity, quality, and rigour of these double-degree programmes could be questioned in some cases. There definitely are effective joint degree programmes exchanged between institutions, however, in other cases there are certain concerns that need to be addressed. The commercialization of higher education and the market-driven approach to cross-border delivery of education may result in concerns about commitment to the quality of education. The importance laid on rankings is evident across HEIs, however, there are apprehensions whether rankings would be viewed as branding tools to enhance attractiveness of the institutions or would rankings be an anchor for better performance of the universities (Knight, 2013).

There are newer accountability concerns that continue to emerge with regard to distance education and virtual universities, which are dependent on the electronic mode of delivery of teaching, it raises questions on assessing the non-traditional forms of instruction (Swift and Morejele, 1996). Similarly, it is sometimes difficult to keep pace with the changing trends of globalization. There have also been deliberations about how national agencies could grapple with consortia consisting of several universities and satellite campuses (Van Damme, *op.cit.*).

CONCLUSION

The global academic thinking has been guided by how to convert universities into adaptative institutions in the midst of the demands of globalization. While the mobility of scholars continues to rise in many regions of the world, it is equally important to have in place quality assessment mechanisms, which evaluate the process and performance of the HEIs. Therefore, administrative readiness of HEIs may be crucial in demonstrating commitment and rigour to quality, essential to sustainable and comprehensive internationalization.

The association of quality and internationalization of higher education has been considerably researched. The literature acknowledges the need for quality in international activities. At the same time we have to be aware that internationalization of higher education puts pressures on the quality assurance mechanisms. While national systems engage in their respective quality assessment practices, the international feature of higher education does not receive enough attention. Moreover, the lack of adequate cooperation between different agencies of quality assessment is matter of concern as well (Van der Wende, 1999).

The quality assurance of internationalization highlights the role of bottom-up initiatives that is the work done by the professional organizations in bringing about quality enhancement in national HESs. Similarly, the transparency of the quality assurance systems remains crucial as the qualification of the courses studied abroad need to be evaluated effectively (*ibid.*).

It is important that the quality assurance systems are internationalized and the quality of internationalization of higher education is enhanced. The positive association between quality and internationalization of higher education would imply an international dimension in higher education as well as different components of higher education are considered simultaneously and yields in internationally recognizable outcomes (*ibid.*). According to Scott (1998), it

is important that the internationalization strategies are made explicit by the universities so that the task of quality assessment is shared by the different members. It is also important that different organizations, which are part of quality assurance, cooperate with one another to attain and encourage internationalization of higher education. Projects like IQRP are instrumental in highlighting the role of quality in internationalization of higher education and vice versa.

The aspect of quality assurance has become far important on the international higher education landscape. The HEIs have acknowledged the need to enhance institutional effectiveness and seek international standards. This is related particularly to the Indian context as there exists a range of university; ranging from excellent performance to universities, which are aspiring to enhance and improve in different disciplines. Therefore, given the variety in Indian HEIs, it is important that there are internal mechanism of quality checks at the institutional level, which are designed keeping in mind the organizational structures and systems. These internal mechanisms may help address the areas, which have room for improvement, the strengths, monitoring of institutional practices and focus on measures that could enhance an institution's quality and thus prospects of internationalization (Powar, 2002). However, quality assurance only through means of monitoring may not be enough. It is essential to look into building supportive infrastructures and develop strategies for teacher training. In a nutshell, it is important that the private and public HEIs come together to build synergies.

Given the nuances involved in the internationalization of higher education, it is perhaps time to relook at the motivations and practices guiding international activities. While cooperation and knowledge sharing were drivers of international collaborations, the emergence of quality concerns and the need for accountability, cannot be underestimated. It is important for HEIs to reflect on how internationalization is conceptualized, how they can better their approach to international activities, and most importantly, how they can mobilize the teaching faculty in creating institutional change. As much as internationalization of universities should be driven by leadership and vision, the role of faculty members in initiating and driving internationalization is unparalleled. Hence it is the responsibility of the institutional leadership to create opportunities for the teaching members, offer them required training and international exchanges and develop a suitable working environment, which facilitates international engagement and open dialogue.

Although there has not been immense research done on international faculty in HEIs as compared to international student mobility, it is worth noting that the contributions and impact of international faculty members could be vast, long term, intangible in some cases and may also result in enhancing the quality of the HEIs. International faculty, just like international students, deserve enquiry into their motivations of being mobile, their challenges, as well as their career trajectories. The recruitment of international faculty is guided by a range of factors related to institutional preparedness as well as external realities. Against a spate of factors that affect recruitment of international faculty mobility, it is important to recognize that quality of research, reputation, and support services are drivers to the recruitment of international faculty. Similarly, the presence of international faculty, in fact long-term international faculty, may positively impact the quality and attractiveness of the universities. In order to attract best international faculty, there needs to be a supportive policy framework at the national level as well as encouraging organizational mechanisms, which facilitate international faculty recruitment. Therefore, internationalization of higher education, consisting of different pathways, could be viewed as a cycle of numerous interdependent processes.

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FINANCING OF HIGHER EDUCATION IN INDIA

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THE DEBATE

Public versus Private Financing of Higher Education

The major sources of financing higher education are public financing, private financing, and foreign aid. Since undue reliance on external funding was limited to a smaller number of countries, it did not attract too much attention in the debates. The debates, in general, centred around the public financing and private funding of higher education.

Public funding of higher education has been common in most countries of the world since the 1950s. An exception to this trend was some countries in the South and East Asian and Latin American regions. From the 1980s one could notice a shift in the strategies for financing higher education ever since most countries introduced market-friendly reforms in the sector following similar reforms in the economic sector. This transition sharpened the debate on the relative role of the state and market in the financing of higher education.

The arguments for or against public funding stem from the way the sector and its contribution to development are valued. Most economists agree that knowledge is a public good (Samuelson, 1954; Stiglitz, 1999). They may differ when it comes to the matter of institutions producing knowledge. The institutions producing knowledge may not satisfy two basic characteristics of public good — non-rivalrous consumption and non-excludability in distribution. It seems higher education has more of a "non-rival goods" property than "non-excludable goods" property (Marginson, 2011). Higher Education Institutions (HEIs) can exclude people from accessing it when it is priced even when it can remain non-rivalrous in a stage of massification and universalization.

It is also argued that higher education is a merit good, under-provided and under-consumed, since the benefits from higher education cannot be confined to those who pursue it because of its externalities. This is an argument relied on for extending state funding for higher education. In the absence of state funding, higher education will be under-provided and profits cannot be the sole criterion to decide the optimum level of investment in the sector (Tilak, 2008). These arguments found favour among policy makers engaged in the reconstruction stage in Europe and newly independent countries where public

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funding became the dominant form of financing mode in the post-world war period.

At times it is argued that the private benefits outstrip the social benefits from higher education and hence it should be treated as a private good for individuals who get it. Some point out that public funding of higher education is regressive (Psacharopoulos, 1994) and public subsidies in higher education have a perverse effect. Others state that the university graduates pay more than the state paid for their education over their working life through the tax system and therefore, the state should pay for higher education (Heaton, 1999).More importantly, state funding is supported from equity considerations (Neave, 2000).

From the points of view of economic rationality and social equity, education was traditionally a favoured sector for public funding. An analysis of trends indicates that public funding of the sector has been inversely related to the level of development of the country. Professor Musgrave(1969) argued for higher levels of public investment at lower levels of development and lower levels of public investment at higher levels of economic development when private expenditure is able to complement, if not substitute, public investment in several areas.

The trends in public financing of higher education during the post-world war period showed interesting trends (Varghese, 2004a).

1. In many countries an increase in the share of the education budget was positively associated with an increase in the share of higher education budget.
2. An increase in the share of education budget was accompanied by a declining share of higher education budgets.
3. Shares of both the education budgets and higher education budgets declined.
4. The share of education and of higher education remained constant.

During the structural adjustment regime resources were reallocated from higher to primary education based on the argument that investment in primary education brings more returns than at the higher education level. This policy made the Higher Education Sector (HES) more vulnerable and the sector was compelled to adopt market-friendly reforms. Since the developed countries were not relying on loans under the structural adjustment regimes, the HES received a larger share of national education budgets in the developed world.

The trends indicate that while international declarations and national commitments helped improve public allocations to education, the priority in allocation was for primary education. In fact, some of the conditionalities proposed that at least 50 per cent of the education budgets be allocated to primary education. The Right to Education (RTE) Acts in many developing countries reinforced these shares in allocations. However, under this arrangement higher education was not a beneficiary of national funding.

External funding did not help higher education either since the aid flow was mostly toward primary education. The Sub-Saharan African countries used to receive the highest share of education aid followed by the East Asian and Pacific region and South and West Asia (Varghese, 2010). In most cases, especially in Africa, the major share of aid was for basic education.

When market ideology became dominant in the development strategy the argument in favour of continued state support for higher education weakened. Consequently, most countries that relied on public institutions and funding in higher education moved towards reforms to augment resources from non-governmental sources. This paved the way for the emergence of two important reform measures: privatization and encouragement of private higher education institutions (Varghese, 2004a). The privatization of public higher education institutions implied that the ownership of the institution remained with the state while the operational processes embraced market principles. The promotion of the private sector in higher education implied non-state actors both in the ownership and management of institutions.

The market friendly reforms in public institutions in the UK and Australia are examples of privatization measures. The USA possibly has the highest tuition fees among OECD countries (OECD, 2017). The student-support systems, especially student-loan schemes, were very common in many of these countries. The OECD countries seemed to rely more on public institutions and on privatization measures than on private higher education institutions to massify, and later to universalize, higher education.

Unlike the developed countries, the Indian experience showed a surge in the private sector during the massification phase. The reforms in India were more towards promotion of the private sector in higher education than privatization of the public institutions. Consequently, a major share of growth in enrolment was accounted for by the private higher education institutions. These reforms not only changed the modes of financing higher education but also the way

higher education is organized and access facilities are provided to eligible students.

FINANCING OF HIGHER EDUCATION IN INDIA

In the 1950s and 1960s, the expansion of higher education in India depended on public funding and public institutions. The governmental commitment and priority in allocation of resources can be assessed on the basis of three indicators:

a) *The share of resources invested in education or higher education as a share of national income*: Following the recommendations of the Education Commission (Kothari Commission of 1964–1966) and the National Policy on Education (NPE 1968), the national government was committed to increase the allocation to education to at least 6 per cent of the national income. The 1986 policy on education also reiterated the national commitment of investing 6 per cent of the GDP on education. Globally, the Delore Committee in 1996 requested countries to invest at least 6 per cent of the GDP on education. In the Jomtien Statement of 2011 governments agreed to invest at least 6 per cent of their GDP and at least 20 per cent of their national budgets on education. Despite all the pressures from international agencies and national academics, India invested only 3.1 per cent of the GDP and nearly 10.5 per cent of the public expenditure on education in the year 2018–19.

b) *The share of resources allocated to education as part of the public expenditure or national budgets*: What should be the share of higher education in the total public spending on education? A Committee of the Central Advisory Board of Education (CABE Committee 2005) recommended that at least 1.5 per cent of GDP needed to be allocated to higher education, one per cent to university and higher education, and 0.5 per cent to technical education (Tilak, 2006). The allocations continue to fall short of the target of 6 per cent of the GDP for the education sector and 1.5 per cent to the higher education sub-sector. The Draft New Policy on Education (DNEP-2019) has also reiterated the Jomtien Statement of 2011. We need to wait and see when India will meet the target of 6 per cent of the GDP and 20 per cent of the public expenditure on education. Another indicator of public commitment is the share of higher education in the total government expenditure. It is not only low but has declined from 2 per cent in 2000-01 to 1.38 per cent in 2011–12.

c) *The share of higher education in education budgets.* The third indicator of the priority in allocations is the share of higher education in the education budget. It seems there is a relative decline of the share of higher education in the total education budget. In fact the higher education share has been low at18.8 per cent in 2000–01 and it has further declined to 17.4 per cent in 2016–17.

The economic survey 2018–19 showed that the total expenditure on education was Rs. 5.81 lakh crores. It accounts for 3.1 per cent of the GDP, 10.5 per cent of the public expenditure and 40.1 per cent of the allocations to social sectors. The revised estimates for 2018-19 indicated an amount of Rs. 83,626 crores for the sector. The school sector accounts for Rs. 50,113 crores (around 60 per cent) and the higher education sector accounted for Rs.3,35,120 crores (nearly 40 per cent). The budget estimates of the MHRD for 2019–20 also indicate a total expenditure of Rs. 94,853 crores and out of that 56,536 (nearly 60 per cent) is for the school sector and Rs. 38,317 crores (nearly 40 per cent) for the higher education sector.

The state governments account for the major share (more than 75 per cent) of the total expenditure on education . With the introduction of centrally-sponsored programmes the share of the state in total educational expenditure has been declining in the recent past. A major share of the central government expenditure is allocated to central universities and institutions of national importance as grants. Similarly, a major share of grants from the technical education budget goes to institutions such as the IITs. A major share of state higher education budgets go to state universities.

Most of the educationally-backward states of India allocate a larger share of their resources to elementary education. For example, Jharkhand invested more than 70 per cent of its resources on primary education; Punjab and Goa invested more than 50 per cent of the resources at the secondary level. Higher education gets a relatively low share. Nearly 20 states allocate less than 15 per cent of their expenditure on higher education (Varghese and Panigrahi, 2019). Public expenditure on higher education is low in some states partly due to the presence of private providers.

ALTERNATIVES TO PUBLIC FUNDING: New forms of financing higher education

Higher education in India entered a stage of massification in the decade of 2010–2020. The growth rates in enrolment accelerated in the 21st century

and the Gross Enrolment Ratios (GER) trebled in the first two decades majorly due to the contribution of the private higher education (Varghese, 2015). Most of the developed market economies relied on public institutions to expand and universalize higher education while developing countries, such as India, with less developed markets, relied on the private sector to massify higher education.

The most common means of mobilizing non-public resources have been cost-saving measures, cost sharing and/or recovery strategies and income-generating activities. Of these, the most common cost-sharing strategy has been cost recovery from students in the form of fees. The Punnayya Committee and the Swaminathan Committee of the early 1990s recommended cost recovery in higher education to the tune of 15 per cent initially, then 25 per cent, and eventually recovery of the full cost of higher education. The Birla-Ambani Committee favoured cost recovery and promotion of private institutions. The Yash Pal Committee, on the other hand, argued for affordable higher education either through scholarships or student loans.

Student loans are another popular method to share the cost of higher education with students/parents. India initiated interest-free student loan scheme in 1963, which was revised and a new loan scheme was covered by banks for accredited universities of India and abroad in 2008.The amount provided as loans to students have gone up several times in the past. The loans are relied on for studies within the country and also for study abroad programmes. In 2000–01 the total number of loans taken was 1.12 lakhs and it increased to 25.9 lakhs in 2013–14. The education loan amount increased from Rs.1,028 crores in 2000-01 to 70,282 crores in 2013–14, which was more than the total central allocation to higher and technical education (Rani, 2017). Many institutions of higher education have adopted important strategies for the additional mobilization of resources. These include: the introduction of self-financing courses; promotion of consultancy services mainly through research; contributions from Alumni associations; and other income-generating activities.

One unwelcome change, but most commonly adopted policy to reduce costs is save on the teacher salaries. An unfortunate trend, which has spread widely in public universities has been to replace permanent teachers by ad hoc, temporary, and guest lecturers. The emoluments given to these temporary faculty members are at times a mere 25 per cent of those given to regular faculty members. There is tremendous shortage of qualified and high-calibre

teachers in institutions of higher education in the public sector. This kind of cost saving is not acceptable as it compromises the quality of education.

The centrally-sponsored scheme, Rashtriya Ucchatar Shiksha Abhiyan (RUSA), was introduced in 2013 to provide funding for public higher education institutions. The state universities and colleges are provided resources to improve their infrastructural facilities, based on the plans prepared by the respective institutions.

In 2017 the government of India set up a Higher Education Financing Agency (HEFA) with the view to mobilize funds from the market as per the requirements of the centrally-funded higher educational institutions. HEFA was seen as a non-profit, Non-Banking Financial Company (NBFC) for mobilizing extra-budgetary resources for building crucial infrastructure in HEIs. The Budget of 2018–19 called for increased investments in research and related infrastructure in premier educational institutions. The Revitalizing Infrastructure and Systems in Education (RISE) programme, with a total investment of Rs.1,00,000 crores in the next four years is a step in that direction. The funds mobilized through HEFA will be used to finance quality infrastructure, research labs, and other facilities in centrally-funded institutions such as IITs, NITs, IIITs, and IISERs, and central universities.

The HES in India has moved from being state-financed and funded to a state-funded but private managed (aided sector), and on to a full cost-recovery model of higher education development. In this new arrangement private institutions play a dominant role in providing services that households pay for.

PRIVATE SECTOR IN HIGHER EDUCATION

Many countries in Asia have an active private sector in higher education. More than 80 per cent of enrolments in higher education in the Philippines, South Korea, Japan, and Taiwan are accounted for by the private sector. Around three-fifths of the admissions in Indonesia and Malaysia are in private universities (Varghese, 2010).

The private sector in higher education is encouraged in India primarily for two reasons:

1. The social demand for higher education far exceeds the fiscal capacity of the state to provide higher education.

2. Public institutions are not in a position to offer the courses and subjects of study, which can be offered in the private institutions.

In other words, the private sector is an alternative to absorb both the excess and differential demands for higher education in India.

The initial years of planned development saw state-led development in all sectors including education. Interestingly, India nationalized many private institutions of higher education in the 1950s. This policy changed in the 1970s when the government supported the establishment of private colleges affiliated to public universities. The private-aided colleges followed the same study programmes, offered the same courses, and students took the same examinations as the students in the public institutions. The next stage was to establish self-financing courses in public institutions.

Many colleges in the self-financing mode were established in the domains of professional and technical education. Kerala was one of the first to start self-financing colleges in the public sector to arrest the outflow to other states of students seeking higher technical education. The Institute of Human Resources Development in Electronics (IHRDE) is a case in point. The success of IHRDE led to the opening of self-financing public colleges supported by the government and later the private sector established many such colleges.

The next phase shows a proliferation of "for-profit" private, self-financing colleges, popularly known as "capitation fee" colleges offering study programmes in the subject areas of engineering, medicine, and management. The southern states of Andhra Pradesh, Karnataka, and Tamil Nadu and the western state of Maharashtra led the private higher education (self-financing colleges) revolution in India. Private "deemed to be" universities were established in the 1990s. For the first time private providers were given the authority to award degrees and could escape from the rules and regulations imposed by the public universities to which they are affiliated.

Private universities were established in the 2000s. In 1995, a bill for establishing private universities was presented but was not passed in the national parliament. In 2000, the Prime Minister's Council on Trade and Industry set up a Committee (Birla-Ambani Committee 2000-2001) that recommended entrusting higher education to the private sector, promulgating a private university bill, approving cost-recovery from students, and extending loans and grants to the economically and socially weaker sections. Many states in India introduced laws to establish private universities and they came into

existence from 2002 onwards. By 2018–19, there were 304 private universities in India.

In 2018–19, nearly 78 per cent of institutions and more than 62 per cent of enrolments were in private HEIs. With the growth of private universities, multi-faculty institutions have become common in the private sector. Enrolments in some of the private universities exceeded those in public universities. With the emergence of the "middle class" in India, the capacity of households to afford private higher education has increased. Private higher education has not only emerged as an alternative to public higher education but has surpassed public institutions in enrolment.

The emergence of the private sector in higher education has lessened the financial burden on the government for providing higher education. Private universities, unlike the aided colleges, do not receive any financial allocations from the government. They are self-financing higher education institutions and rely mainly on the fees paid by students. In other words, the major change in the financing of higher education is a shift from public sources to private sources.

DNEP 2019 AND STRATEGIES FOR FINANCING HIGHER EDUCATION

The Draft National Education Policy, 2019 (DNEP-2019) envisages fast expansion and structural changes in higher education. The annual enrolment in higher education is expected to increase from 102 lakhs in 2017–18 to 169 lakhs in 2024 and the total enrolment is expected to increase to 595 lakhs to achieve a GER of 50 per cent by 2035. The expansion targets will require additional public resources, even when the major share of additional enrolment will be absorbed by private institutions.

The HES in India requires concerted efforts and good investment in technology-mediated education. This is important for improving the overall quality of higher education, changing classroom practices, and promoting globally competitive higher education graduates. The MHRD has taken a lead through its various initiatives, including SWAYAM, to facilitate a transition from face-to-face interactions to technology-mediated learning opportunities for students of higher education.

Another proposal of the DNEP 2019 is the flexible pathways to learning:

- Four-year undergraduate degree programmes

- Common regulatory framework for both public and private institutions
- Separate institutions for standard setting
- Funding decentralized institutions for accreditation
- Several new bodies at the national and state levels.

All these new initiatives will require heavy investment in the sector. India spends less than 4 per cent of the GDP and 10.5 per cent of its public expenditure on education. The DNEP retains the recommendations of previous policies — the need to ensure 6 per cent of the GDP as a target to finance education and also suggests that the public expenditure on education be increased from the present level of 10.5 per cent to 20 per cent in the next ten years — an increase of around one per cent annually.

Further, there is a need to closely examine the intra-sectoral allocation of resources Presently, these are the approximate allocations of investments:

- 44 per cent of the public expenditure at the primary level
- 25 per cent at the secondary level
- 17 per cent at higher education
- 14 per cent in technical education.

These shares may change since the age-group children and enrolment at the primary education level is declining The CABE Committee of 2005 recommended that the allocations to higher education should be 1.5 per cent of the GDP. As stated earlier, there is a need to reach the targets of 6 per cent of the GDP and reallocation of 1.5 per cent for the higher education sector.

The strategies for resources for higher education will include:

- better targeting of public resources,
- cost sharing and recovery methods, and
- mobilization of additional resources from non-government sources.

Student loans are emerging as an alternative source of financing higher education. The amount of student loans provided by the banks increased substantially in the recent past and it surpasses the central allocations to higher education. However, equity considerations demand that students from remote rural areas, economically poor, and socially disadvantaged to be protected. This is possible only when the limited public resources are effectively targeted.

Another area of targeting is the quality improvement programmes. For example, the Education Quality Upgradation and Inclusion Programme (EQUIP) group set up by the MHRD in 2019 prepared a five-year vision plan for the years 2019 to 2024. The EQUIP team has estimated the additional resource requirement for higher education sector to be at around Rs. 1.72 lakh crores for the next five years. Of the total additional investments nearly 43 per cent will be for programmes on quality, excellence, and research. The amount envisaged for improving access is around 17.0 per cent and the same share is envisaged for governance. This seems to be a fair division of shares between different areas within higher education.

CONCLUSION

The debate in financing education centresaround the role of the public versus private funding. Post-independence India followed a state-centred development strategy in all sectors of the economy, including education. Consequently, expansion of the education sector was dependent on public policy and public resource allocation. These trends in financing higher education changed from the 1970s when the aided private sector came into existence. In the 1980s, self-financing courses started in public institutions followed by the proliferation of self-financing colleges in the private sector.

The emergence of private universities in the beginning decades of this century helped absorb a large number of students seeking admission in HEIs. At present more than 75 per cent of the institutions are private (including aided institutions) and together, they absorb more than 62 per cent of the enrolment in higher education. Although the private sector acts as a safety valve to legitimize reduced public spending on higher education, promoting the private sector has its own implications for equity. For example, regional concentration of HEIs and an urban bias in higher education development is an issue to be addressed. This requires proper targeting of public resources to open institutions in the remote and deprived regions and locations.

Another area for intervention is cost-sharing and cost-recovery. There is scope for targeted cost-recovery measures whereby those who can afford it do not benefit from the public subsidies and they pay for their education. Similarly, student loans are emerging as an important source and an alternative for financing higher education. The government may initiate steps to support students through student loans.

It is important to emphasize here that the role of the state is not confined to funding alone. The role of the state as a sole source of funding for higher

education has come to an end. However, the role of the state in providing a framework for funding and for the management of higher education remains unquestioned. We need to redefine the role of the state and public bodies to ensure that higher education development does not compromise on equity, quality, and affordability.

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SYSTEMS APPROACH TO SKILLING AND VOCATIONAL EDUCATION IN INDIA

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INTRODUCTION

In 2020, India is on the verge of becoming the youngest nation in the world with the median age of its population at 29 and with 64 per cent of its population coming into the working age. This demographic dividend has the ability to accelerate the growth and development by positively impacting India's performance in social, economic, technical, and political domains. To channelize the potential of our youth in building the national human capital, skilling and vocational education hold the key. Therefore, the present and the future generations need to be educated, proficiently and profoundly trained in vocations with effective and efficient skilling programmes, starting as early as in pre-school and heading to PhD.

For a very long time, skilling has been narrowly conceived as a task enabler but in reality it serves a much bigger purpose and can be rightly classified as: life enabler, technology enabler, material enabler, and economy enabler. It can lead to financial stability and contribute to the safety and security of young women, and underprivileged and passionate young students having no means to education, thus strongly contributing to our economy. Through its 360-degree impact, skilling programmes can be structured to support improved quality of life and livelihood, and ensure basic needs such as health, water, sanitation, education, and energy.

The societal impact and externalities of skilling and vocational education are beyond the levels as presently perceived. Thus, it is important to assess the impact of such programmes to validate and foster their pivotal role in changing life of individuals and communities when designed and implemented in the right spirit.

India has a great potential to be identified through its innovative and creative skilling programmes across the globe with its rich diversity, unique variables and largest number of youth to serve. Thus, it will not only build its own capital but become a skilling garage for the rest of the world. To accomplish these objectives, skilling and vocational education in India needs to be viewed in a larger perspective, with a sustainable and inclusive systems approach, designed to cater to its unique, diverse and complex set of problems.

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Presented here is an innovative systems approach to skilling and vocational education covering the unique aspects and different dimensions for India, based on the incremental guiding parameters: Initiative, Creativity, Innovation, and Excellence with Relevance. Also appended are special case studies (given as Boxes 1 to 6) as conducted by faculty of Dayalbagh Educational Institute (DEI), which provide invaluable insights and applications of the topics discussed here.

DECOUPLING SOCIAL STIGMA AND SKILLING

All education policies and commission reports support skilling and vocational education for their ability to create an alternate path for human resource development. Even the recent Draft National Education Policy, 2019 (DNEP-2019) aims to provide access to vocational education to at least 50 per cent of all learners by 2025. Despite of all the recommendations and efforts the social stigma attached for participating in skill programmes as prevalent in the public at large, has led to their failure making students, teachers, institutions, and universities reluctant to participate in skilling and vocational programmes.

The solution to the above problems lies in restructuring the educational framework and introducing work-based courses in the conventional educational programmes. The strategy of bringing together general education and skill education will encourage students to experience both courses and take a rational decision to fulfil their ambition while following either. Educational institutes need to offer lateral transfer and flexibility between general education and skilling and vocational programmes, to popularize them and give students the opportunity to opt for a path without exclusively starting the journey for the same. The feasibility of credit-transfer under the choice-based credit system will significantly contribute to deeper understanding and relevance of skill and vocational programmes in the gamut of conventional programmes. This set-up will enhance social and academic interaction and exchange of ideas between peers, seniors, and teachers from similar and diverse courses and streams of education, and create wider social acceptability and understanding of the courses among learners and teachers. Further, the same set of teachers who contribute to conventional education can participate in skill-based courses as part of their academic endeavour and promote interdisciplinary approach and realization of the possibilities of success as well as life-changing paradigm for students, through skilling and vocational courses.

Research-based programmes can be introduced in domains of skilling so that students willing to pursue MPhil and PhD can upgrade their education as

it happens in conventional education. Such steps will encourage students to pursue skill programmes to transform themselves from unskilled, to semi-skilled, to skilled, and ultimately highly skilled individuals. They could then contribute effectively and efficiently in national missions, such as Digital India, Cyber Security, Swachh Bharat, Waste Management, Clean Drinking Water, Skill India, Stand-up India, and Code-India programmes.

MULTI-SKILLS AND MULTIPLE SKILLS

The analogy of skilled individuals to machines based on their ability to perform a particular task and contribute in an economic activity demeans the position of individuals and as citizens. This, in turn, stagnates their horizontal and vertical mobility both in education and in socio-economic strata. This viewpoint has also contributed to the social stigma associated with skill and vocational courses. It has led to the belief among the masses of the narrow capacity of skilled workers in dealing with wider and bigger problems and positioning them at the bottom of the work pyramid from where no path is laid for them to rise.

The aspirations of the New India, which revolves around creation of indigenous solutions, the ability to adapt and adopt local solutions, promotion of innovation through 'Jugaad' the frugal approach for optimal and economical utilization of resources, signified by national initiatives like "Make in India", make it essential that a student be trained in multiple skills.

The most important skill underlying creativity and innovation is the ability to integrate components and parts to create complete solutions, which can be scaled up and multiplied across the globe. Restrictive and conservative views on skilling make the programmes unpopular, they mar the ability of imagination and creativity of both students and teachers with respect to their learning and profession. Therefore, backward, forward, upward, and downward skill integration can create an ecosystem that can significantly lead to understanding of solutions, technologies, and contribute to job creation and entrepreneurial opportunities.

Skilling needs to be viewed as an interdisciplinary, multidisciplinary, and transdisciplinary approach to education. Attributes developed by such an integrated approach provide the platform for the emergence of qualities in students, which is not possible with conventional education. Multi-skills is an approach, which prepares learners by expanding their ability horizontally with the inclusion of more skills. This establishes interconnections among

various skills and their ancillary skills. With wider knowledge and skill base individuals trained for multi-skilling can become problem solvers rather just a part of the solution.

On the other hand, multiple skilling looks into generating the capacity to multiply skills and vertically move across the levels to higher-order thinking. The avenues for multiplying skills and moving upward in their ability is practically missing for students who take up skilling or vocational courses. It is important to scale up the curriculum and embed it with the ability to multiply the skills and also motivate them enough to move beyond employment opportunities and create organizations around themselves. This way they can contribute to the economy through job creation and become innovators to integrate, various skills in the most optimal, economical, efficient, and effective manner.

For example, one can expect an electrician to repair a fault line so that a system works, this is an easy solution. But, in case someone wants to get a solution for the efficient distribution of electric supply by integrating a rooftop solar system along with the distribution and an optimal demand solution which will be different for each household, then multi-skills and the integration of skill sets becomes the obvious and better option.

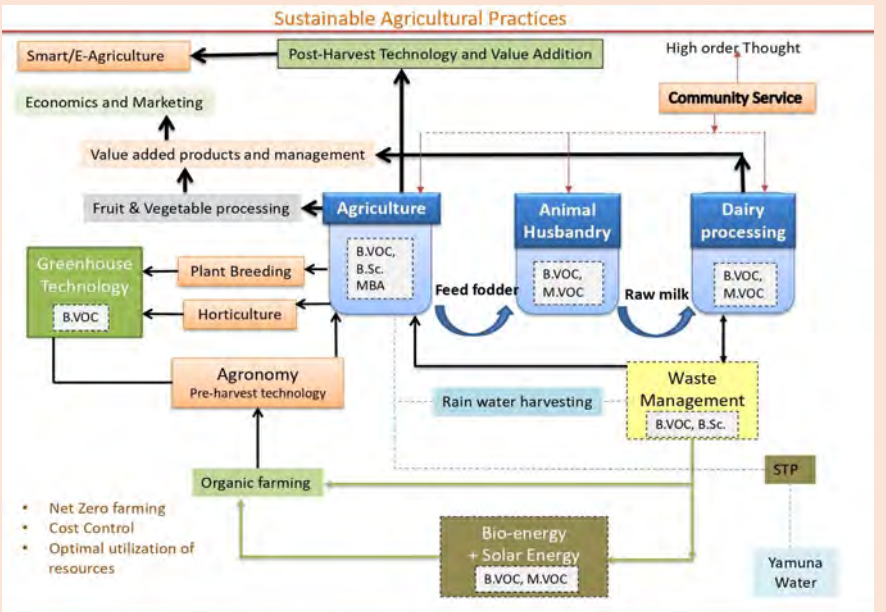
Therefore, a person trained in a 360-degree skill set around the primary skill would be able to find the optimal solution, add value to the solution, and utilize skills of co-workers and tools efficiently. The feasibility of creating multiple solutions and analysing them to arrive at the best solution requires original ideas. The bottom-up approach to innovate, design, and develop products will naturally be evolved for learning and implementing complex systems. Examples for multi-skilling and multiple skills have been demonstrated through systems models in Boxes 1 and 2.

A modular approach to designing the curriculum would lead to multi-skill and multiple skill set personnel. A strong relation can be established between "getting trained" and "getting ready for the world" by including labour laws, taxations, understanding of micro and mini businesses, integrating with teams for solving larger problems, and understanding of documents like agreements and contracts, adhering to values, sensitivities, civic codes, and quality-based delivery of services and products. This will lead to outcomes contributing to both economic and social gains. It is important therefore, to broaden the approach to skilling, both horizontally and vertically. Some benefits of multi-skilling and multiple skilling are given here.

1. Restricted versus Integrated Approach to Skill and Vocational Education

Skilling and vocational programmes can be viewed either as stand-alone qualification and people can be trained in a narrow domain, or as an aptitude for functional knowledge. Multi-skill and multiple skill sets can play a vital role where organizations can be created around solutions, with value additions, and innovations. These can be further enhanced by integrating culture, traditions, and resources.

Box No. 1: Systems Approach to Vocational Programmes in Agriculture and Allied Fields



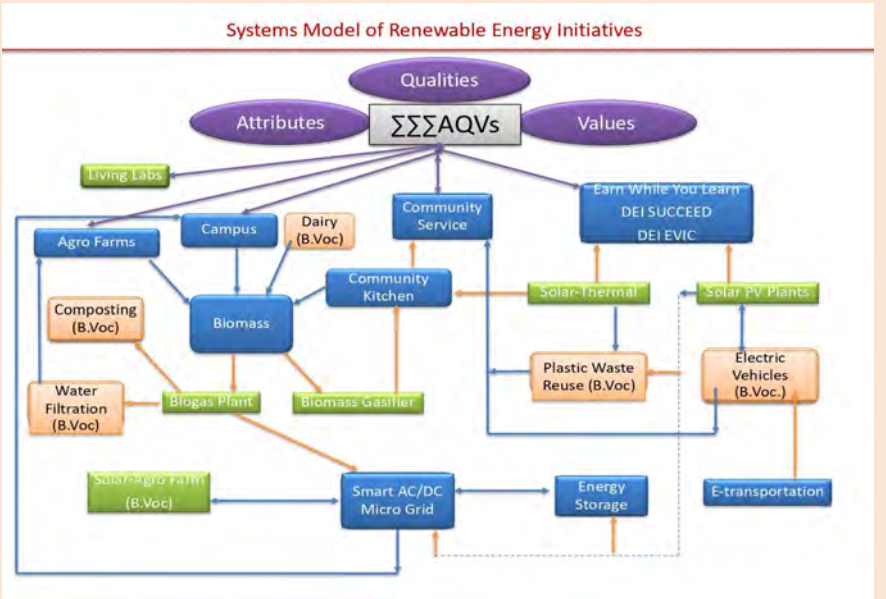
Agriculture and its branches like agronomy, horticulture and plant breeding are closely allied with dairy and animal husbandry. They form an integrated system with interconnections involving multi skills, multiple skills and vocational programme at every niche.

Sustainable agriculture practices at DEI include Integrated Farming System (IFS) with optimum use of resources where waste or output of one enterprise becomes the input for another, ensuring environment friendly and cost-effective farming. The primary products of plants like grains are used for human consumption and green fodder, straw and husk are utilized by cattle. The milk produced by cattle is utilized for various products and value additions. The crop residues can be used for animal feed, while manure from livestock can enhance agricultural productivity. Whatever waste is derived from these activities is further processed to get useful products such as, compost and bio-ethanol.

Integration of greenhouse technology, seed technology, plant breeding boost-up production with improved input to farm. Output gets channeled to market through value addition units and courses like MBA help in creating new markets. Smart agriculture initiatives like remote sensing, disease forecasting, resource management, ICT and others get promoted.

Contributed by: Rajiv Ranjan, J. N. Shrivastava and D. Prem Kumar, DEI

Box No. 2: Systems Approach to Skilling in Renewable Energy



Renewable energy initiatives at DEI provide living laboratory like Solar-Agro Farm, Dairy, Biogas Plant, Biomass Gasifier, Solar SV Plants for live experimentation and multi-skilling activities for students. Skill development in renewable energy is not limited to B.Voc. Renewable Energy students but its application in other areas is promoted by courses like B.Voc. Agriculture, Auto, Sanitation and Waste Management and Dairy, as shown via systems model for renewable energy.

The waste generated from farms, campus, colony, dairy, kitchen serves as the biomass used for energy generation. The wood waste, husks, and stalks go to biomass gasifier, and the residue fuel, that is, activated charcoal, is utilized for water filtration and as pesticide and disinfectant in agriculture farms and slurry for composting.

DEI has installed distributed roof-top solar photovoltaic (SPV) power plants for efficient clean energy with storage banks. It has its own smart microgrid with remote monitoring and control. Further improvements are under process to convert it into an AC/DC smart microgrid, which can feed both AC/DC loads and can synchronize different sources of renewable energy on the same grid. SPV powered charging stations are developed at the Institute, which assist E-transportation for local commute within the campus and in colony.

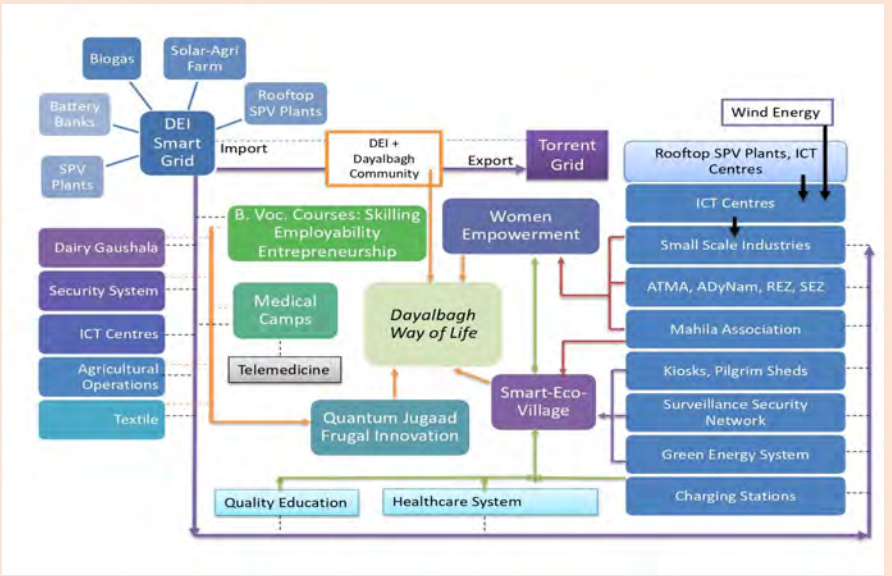
This system altogether promotes Institute framework of Quality-Air, Water, Agriculture and Dairy, Innovation, Education, and Healthcare, Attributes — Smart, Mobile, Resilient, and Values — Ethical, Moral and Spiritual.

Contributed by: Gaurav Pratap Rana, D. Bhagwan Das and A.K. Saxena, DEI

Such an approach will permit transitions among programmes at the undergraduate level through lateral entries and encourage students to register for more than one programme at a given time to get certificates at different levels. A choice-based system, in the real sense, will facilitate multi-skill sets and multiple skills qualifications. Integration also promotes collaboration among people who are experts in different fields. This leads to new designs, novel products, and deeper understanding of services as expected from skilled persons.

Skilling and vocational programmes must be an entry to higher education for achieving higher goals rather than a disconnected affair of low-level employability. The effective training on mini plants requires to be a part of curriculum inhouse. Therefore, the employability should not become an issue ever. At present, such schemes are practically non-existent and a choice-based credit system should also be encouraged to build in mechanism to assist the integration mentioned above. The examples of life-cycle approach and circular economy are given in

Box No. 3: Systems Approach to Integration and Aggregation of Technology: DEI Smart Grid



Comprising several types of renewable energy sources, the DEI smart grid is tied with the main service grid (torrent power) via hybrid inverters, capable of importing as well as exporting power to the grid. The grid supplies clean energy for pasteurization, chilling, cow parlours in the *gaushala* (cow shelter) and for induction cooking in dairy and other agricultural activities. Uninterrupted power is provided to the DEI Security surveillance network, medical camps, textile, and other initiatives at DEI and ICT Centres.

A healthcare synergic system exists in Dayalbagh with an ayurvedic *davakhana* (clinic), acupressure centre and yoga centre and a hospital equipped with ECG, Pathology, X-ray centre, Maternity centre, ICU facilities,.

Small scale industries like textiles, footwear, handloom and pharmacy provides basic industrial training with hands on experience to the students and interested residents of the society. Mahila Associations (women's associations) and Apparel and Toy Making Association (ATMA) centres create avenues for local women to learn, earn and become self-reliant while serving the community.

Rural economic zones are made and are connected to state economic zones further connected to global market and e-markets. This enables to create a socio-economic platform for students and budding entrepreneurs to market their frugal innovations and creative products through DEI Quantum Jugaad. It comprises outlets where students can market their own products.

All these activities are relying on the developing and ever-growing DEI smart grid, which enables Dayalbagh to become an eco-village and serve as a model of self-sustainable community living in harmony with nature and practicing simple living and high thinking.

Contributed by: Gaurav Pratap Rana and Prem Kumar Kalra, DEI

Box 3, showing ample opportunities in all connected areas.

2. Service versus Creation of Organizations

Employment, education, and entrepreneurship are the three outcomes of skill and vocational education. Skilled youth should not be trained only for service but for setting up their own organization. By focussing just on employment we increase pressure on the service sector and increase unemployment. It is crucial to prepare youth to be on their own, by leveraging their potential to create organizations.

It is a myth that skilling doesn't create leaders in society, industry, or organizations. In the Western world and even in India, several successful and impactful industries have been built by people who have barely gone to schools or universities. Some of them understood the values of flexible education only after they had tasted the fruits of success.

The key to becoming leaders is to build a personal model of success rather than imitating others. People who have risen from the lowest rung to the highest have the deepest understanding of the system, law, finances, training, and interpersonal relationships. Family businesses, around the globe, are passed on with set traits to the successors; but outsiders, who believe in disruptions, care much more about the surroundings and their developments. They are keen to bring about change. Therefore, skilling should be treated as an opportunity and an engine of change, which starts with a small step to become a big game changer.

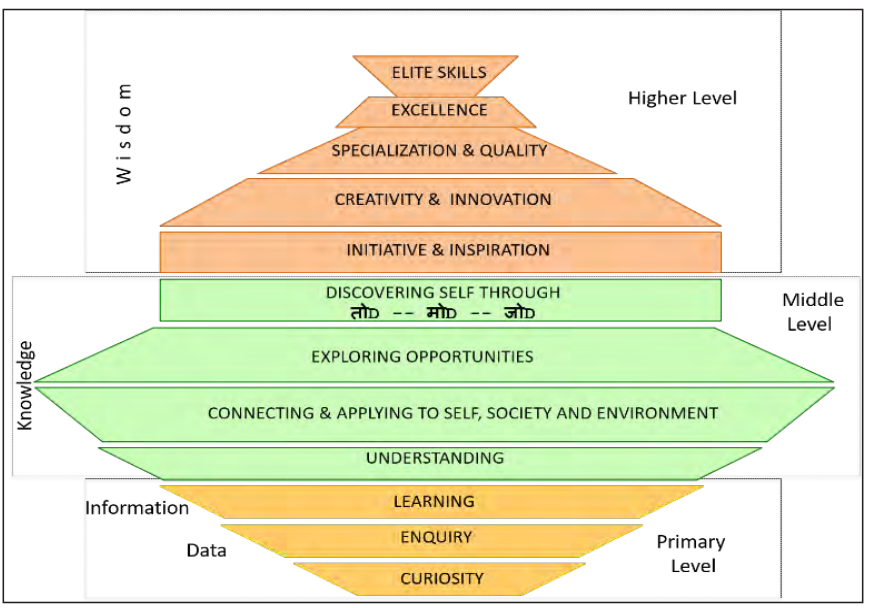
3. Innovation in Higher Education and Skilling

A new modus operandi in education may lead teachers and students to learn multi-skilling simultaneously, which can open new domains of learning and research for everyone. This new avatar of education will involve including skills both as a method and as an outcome of classroom teaching. We can look forward to classroom examples of a system where lesson plans will be developed for a given course using paintings, dramas, animation, puppetry, and their combinations. These skills will be enhanced and embedded in technology utilizing platforms from real-life to simulations, virtual reality, and augmented reality to become part of the teaching curricula in most courses starting from schools to higher education. This changes the way we perceive the relation between conventional education and skill education.

Since the trend is, "do it yourself", students will acquire multiple skills to learn and practice in education. The teachers will have to step forward and accept this change to encompass the needs of the new education system and obtain multiple skills to teach their students. This will create new business opportunities and novel thoughts to comprehend the implications in the future. Skill and conventional education together will create a better world and opportunities for the future generation. Therefore, integrating conventional education with skill education and vice-versa is the most important decision to be taken, at all levels, by decision makers.

LEVELS OF SKILLING ACROSS EDUCATIONAL PATH

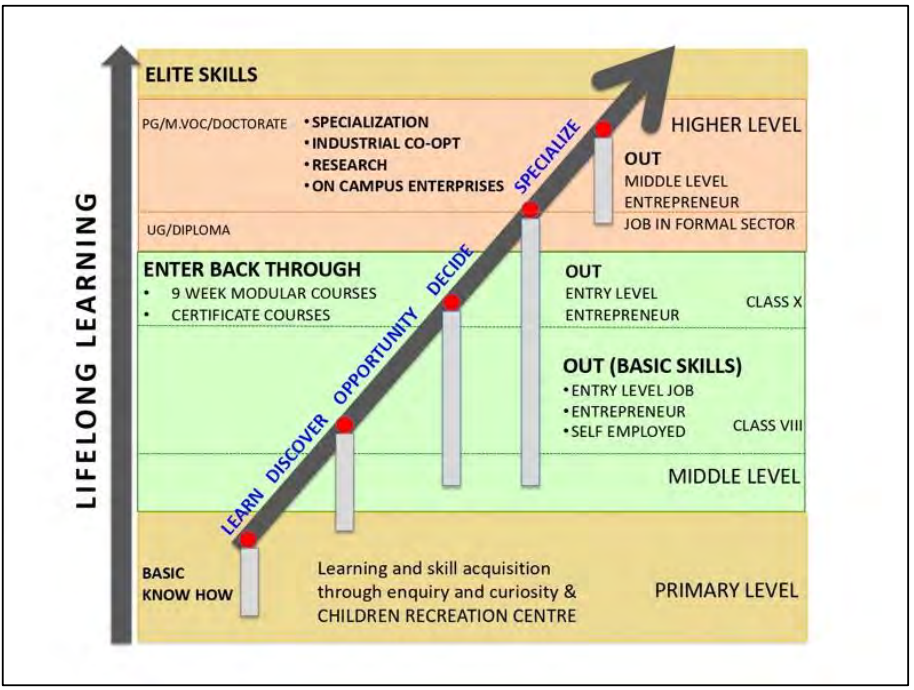
Broadly speaking, skills can be divided into two levels: conventional skills and elite skills. Presently, there is very little emphasis on elite skills, such as, language restoration, heritage restoration, and reviving old paintings and artworks. It is critical to create a new model of education that promotes integration of various types of skills and opportunities across all levels of education. A cafeteria



approach, which brings together the best of the experiential, constructivist, and action-learning approaches, can be implemented (as shown in Figure 1).

Figure 1: Diamond model for levels of skilling.

Skilling follows a hierarchy, which can be drawn parallel to the conventional



education path, along with some alternate channels for weaving general education and skilling and vocational education from nursery to post-doc as shown in Figure 2.

Figure 2: Lifelong learning model of education with multiple entry and exit points.

The process of learning can be grouped into three levels: Primary, Middle and Higher.

- *The primary level*: Included in this level are children from nursery to Class V. These young and curious students are made to learn through enquiry, observation, and by igniting their curiosity. At this level, Children's Recreation Centres (CRC) along with conventional academic learning offer well-structured play-way skilling activities. The CRCs function like "edutainment labs" where young learners share ideas and resources and work together, with their hands , under the supervision of mentors.
- *The middle level*: Skill development at the middle level or the secondary level (from Class VI to Class VIII) is integrated with the regular curriculum through Discovery Labs. These vibrant spaces are stocked with facilities for various skills. Students are encouraged to explore, tinker, and discover their talents, which they can then pursue from Class VIII onwards. After Class VIII, students who have an aptitude and interest in skilling can exit

into purely skill-based pathways, with the option to get back to formal learning at any time through nine-week modular programmes, which are 'fillers' and help learners meet the prerequisites of the course they wish to pursue. The middle-in and middle-out approach addresses the problem of early dropouts by making them move towards skilling programmes (as shown in Figures 3). Thus, a complete pathway for skilling with multiple entries and exits must be followed to present an adaptive system of education, centred around the young students and their needs.

- *The higher level:* The learners who have the correct foundation, specialize in a field at this level which refers to post-secondary, college, and university level. The integrated system of education, with lateral and

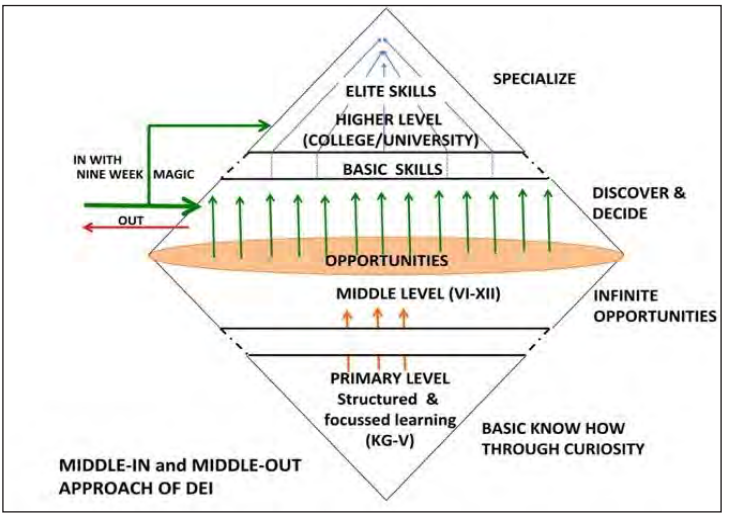


Figure 3: Middle-in and middle-out approach.

vertical connections between track-based academics, technical, vocational and skill education programmes, allows learners to specialize in a trait or field through qualities and values, initiative, and excellence.

This drop-by-drop method of accumulating knowledge and skills builds both the expanse and depth and helps students to analyse the complexity of a problem in its totality. Continuous evaluation is essential at all levels. The disruptive learning methodology can bring in the novelty in teaching and learning process and include activities such as group discussions, minor projects, peer learning, and skilling camps.

To run such a plethora of courses at multiple levels, an open-learning ecosystem is required where, infrastructure resources are shared in space and time at all levels, making the implementation of new changes and analysis

of their outcomes faster. This would be an adaptive educational system, maximizing the benefits and remaining relevant to the needs of both society and industry.

ATTRIBUTES FOR SKILLING AND VOCATIONAL EDUCATION

Skilling and vocational education is an integrated system of knowledge, skills, and attributes, which leads to developing competency in students. It is inevitable to look beyond training the hands, the heart, and head, to create inclusive and sustainable learning pathways, which catalyse the students' personal, social, and professional growth.

Among the three, attributes are the most neglected aspects of skilling, which has the potential to make any programme hollow if not achieved. Skilling programmes should inculcate sensitivity, values, ethics, quality, and conscientiousness as the foremost attributes among students and teachers. This can be accomplished by designing skilling and vocational programmes with compulsory core courses in addition to content related to specific skill sets. These programme should also include experiments, laboratories on land, industrial training, and internships for practical and professional exposure to real-life challenges. In the aspects covered here are: (1) Two kinds of models, embedded and appended models of skilling; (2) Internship; (3) Opportunities for Entrepreneurship; and (4) Creating Human Cloud and Organization.

1. Embedded and Appended Models of Skilling and Vocational Education

The embedded model of skilling and vocational education involves education being embedded in a value-based quality framework. Introduction of core courses in the curriculum like Comparative Study of Religion, Indian Culture, Sports/Physical Education, Yoga, Environment Protection, and Disaster Management will promote value, quality, and other attributes and also life skills.

The minimum number of credits can be assigned for work-based experience courses, skill practices, and vocational programmes, along with life skills courses for majority of population as part of mainstream education. These courses should be introduced in all institutes and universities, and if possible, in schools as well so that overall appreciation starts emerging at an early age. Technology related courses such as, Information Technology, Artificial Intelligence, and courses on finance, language, civic codes, qualities and values also need to be part of the curriculum. Work-based courses enhance working

with one's hand, improving functional skills and the aptitude for building solutions. Such training will surely improve our technical and professional education and will also address issues related to social stigma attached with skilling and vocational programmes.

The appended model implies moving beyond the courses and experiences embedded in the institute programme, towards the local services, industrial services, on-job training exposures for students. These experiences can be interwoven with conventional courses also such as the Bachelors courses for the arts, commerce, and science (B.A., B.Com., B.Sc.) based on individual interest, aptitude, and need leading to the integration of minimum credits from education and skilling. Such programmes may not be as fulfilling as embedded programmes, which are based on maximum credit of interest.

2. Internship During the Programme of Study

Institutes can dedicate at least one semester to job training or practices as interns in educational institutes itself giving the opportunity to learn and develop solutions to real life problems. Internship programmes can add value to students in terms of experience in real life. By the end of an internship, it is envisaged that a student will have acquired:

a) ability to link theory with practice in each skill and its ancillary skills
b) application of skill in a team environment
c) acquire new learning through experience, by doing, and by facing challenges
d) demonstrate professional skills with positive attitude and energy in a workplace
e) develop self-understanding, self-discipline, maturity, value system, and confidence.

Internship brings in maturity to understand the deeper requirements of customers and consumers. The integration of various courses and skill set can add efficiency and optimization in the solution or operation. Institute should give students living lab opportunities to learn, so they can enhance their understanding about the bigger picture and the crucial role of a given skill set. Internship at local organizations and mini plants will exposes students to various asymmetries of society and opportunities for development.

All skilling programmes should include "earn while you learn" scheme. This plays a dual role of meeting the financial needs of students for self-sustenance and to creatively balance working and learning. Institutes need to design space

for co-learning and co-working for students, thus ensuring participation of students with little or no means to fund their education. The scheme can also be projected as part of programmes like Maintenance-Network Research Programme across campuses so that students contributing in such programmes will earn while they learn and services and systems in campuses can run efficiently. Such incentives will motivate students to pursue higher education, who otherwise dropout because they are unable to afford the university or college education.

3. Opportunities of Entrepreneurship in and around Campus

The educational campus should be an example for promoting entrepreneurship in the areas of services, manufacturing, product design, and content creations, such as security, library, waste management, apparel manufacturing, food processing, hospitality for event management, IT services, and many more. Instead of outsourcing or hiring services, students should be engaged on similar terms and conditions. This creates peer pressure to excel and at the same time the shortage of local industries can be successfully addressed. Such support assists educational institutes to fulfil their social and community obligations and responsibilities. Multiple examples of such operations on campus will help remove barriers of caste, creed, gender, and religion.

"Earn while you learn" gets scaled up to a level where students get the confidence to deliver and meet expectations of different stakeholders. The growth of individuals as an organization can be supported by the institutes and communities by helping them to establish Association of Persons (AOP) while tinkering on innovative ideas, with credit from the institutes or interest-free loans. As soon as the groups pass out of the institute they can form Self-Help Groups (SHG) and continue building their organization further. This acts as an incubator and works towards the challenge of the lack of entrepreneurial skills and handholding.

Most cities and towns have low industry interface due to the non-existence of industry and also the absence of business culture and professional environment. Education institutes can transform the conventional paradigm separating industry and institute by acting as a nursery for mini plants based on waste management, recycling of paper, and opening institute infrastructure to create products and provide services in off hours, thus creating new opportunities and benefits for all stakeholders.

4. Creating Human Cloud and Organization around Oneself

Education needs to promotes collaboration, peer learning, and working across

networks. The need of the hour is not a single person with all the expertise, but a group of individuals who can form dynamic organizations to solve a problem, bringing optimization, and innovation.

Approaches like Human Cloud Creation where individuals with different sets of skills form a network and work in collaboration can successfully cater to the population. Human cloud brings in need-based expertise for a given solution, and contributes to cost cutting and faster solutions, through lean organizations, which create more value for customers with fewer resources. This novel approach moves beyond the service category and widens the scalability of the skill sets of individuals when working in synergy. Similarly, this approach will be very effective for the maintenance network of large systems. This system will be fed by learning the best practices from peers. Its impact will include parameters like how many personnel of the same and similar trade over a period start treating themselves as peer to learn best practices. This collaboration will create better utilization and distribution of profits earned over a period between oneself, family, and local people. Therefore, building communities with an approach of welfare and development as part of social responsibility will lead to examples to be replicated.

By revamping the education model around initiative, creativity, innovation, and excellence with relevance we can promote overall development of learners and lay down the path for building networks and organizations around an individual and an individual in himself can be an organization who guides and mentors people around him.

MAPPING THE SOCIAL IMPACT OF SKILLING AND VOCATIONAL EDUCATION

While much progress has been made, there remain rural pockets in India about which little is known, especially with respect to residential, business, and tourism experiences and opportunities. For India to advance further, all village communities must and should reap the fruits of progress and modernity. Varied approaches to the development of rural areas, such as Smart Villages, Provision of Urban Amenities in Rural Areas (PURA), Rural Economy Zones (REZ), and Special Economy Zones (SEZ), and other rural livelihood schemes, have financial uplift as their primary goal. But it is equally important to examine how education, development, and prosperity can be brought to rural residents while helping them retain and maintain their moorings, surroundings and heritage, in fact, their rural *samskara*, the inherent impressions and dispositions.

Notions of development do not lie in financial growth alone, and nor should development aim to convert villages or sparse habitats into urban settings. As the world edges towards becoming what Tom Friedman calls, "Hot, Flat and Crowded", the need of the hour is smarter living, and the utilization of technologies for a balanced rather than one-dimensional growth. Rural innovations and the benefits of a frugal lifestyle are lost in the so-called modern approaches of financial growth, which often takes place at the cost of enrichment, enablement, and empowerment of village dwellers.

Some pertinent questions may be raised at this point:

- What is the notion of rural development?
- What are the expected observable outcomes?
- Should we look at increased revenue or a continuously evolving and sustainable quality of life?
- Should the aim be urbanization or to retain simplicity and cultural heritage with appropriate technology interventions?
- Is it about understanding rural needs or only about aligning the rural socio-economic lifestyle to urban greed?

Developing communities, especially in the rural sector with economically marginalized people, means benefits and outcomes being shared equally by every individual, irrespective of caste, colour, and creed. The balanced growth in all facets of life — social, economic, environmental, political, educational, health, hygiene and sanitation, or women's security, and empowerment demands a balanced, physical, mental, and spiritual development of the members of the community. An embedded model of education with skilling and vocational education programmes can contribute to this.

The creation of value and knowledge-based micro-economies, requires not only a transformation in the thought process of the beneficiaries, but also of the policy makers. It calls for a change to see the change, and the education sector has much to contribute to this gradual and evolutionary process of transformation. Thus, there is a need to develop a vision and mission for a village or a village cluster that leads to sustainable improvement in the quality of life without environmental deterioration. As a step in this direction, can we create universities in villages?

Such universities can act primarily as the learning seats of local innovations, medicine, culture, literature, art and folk skills. These rural universities will

not only restore the decaying diversity of India but can also become attractive learning centres for the intellectual elite in the world. Today's development policies unfortunately force many village artisans to become labourers, and daily-wage earners, fulfilling the demand of exploding urban economies. But by empowering artisans as faculty, specific skill and vocation-based curricula can be created for value addition and for branding a village on a cultural theme.

There is an important point to be made here that skill training and vocational education can also become a tool for reviving and rejuvenating local cultural traditions and depleted unique services and products. Local art, and heritage can also be restored with local expertise. REZs can be created to nurture and foster skilling and vocation as business models to improve the economy as well as the quality of life. Therefore, casting skilling and vocational initiatives into a narrow perspective may miss its wider impact.

Our nation, on the one hand, faces deep-rooted and persistent challenges such as illiteracy, dropouts, unemployment, skill-gaps, wage disparity, and on the other confused, disoriented, and disinterested youth. Confidence-building among the youth through skills, financial stability, and goal-oriented education for providing livelihood and for improving the quality of life can play a key role in reducing these challenges to a great extent.

The implementation of various skilling and vocational programmes should provide opportunity to students to practice concepts, do practical work, have industrial and mini-plant experience in the institute, or/and in the vicinity of their neighbourhood. Thus, learning functional knowledge on the job training and established credits for education certification will lead to better recognition in the public at large. This way they can support their family in terms of further education and livelihood.

The social impact of these activities can also be measured in terms of qualification and opportunity enhancement, and change in the mind-set of the neighbourhood. The visible change in social status takes place because of learning certain skills and exposure to certain others. This has a snow ball effect on the closely knit community leading to more and more students getting registered for such programmes. It will slowly but surely raise the education and economic levels of the family and the community.

Skilling and vocational programmes, therefore, must be placed in educational hierarchies early enough so that they can be recognized as a potent empowerment tools for self-support in education and for support for family. This would lead to nation building from inside to outside, with villages becoming major contributors to solutions at the national level and even at global scale.

CHALLENGES AND BOTTLENECKS FOR SKILLING AND VOCATIONAL PROGRAMMES

1. Local Infrastructure Issues

Skilling and vocational education is incomplete without hands-on experience and practical training as absorption in the industry, employability, and even entrepreneurship needs industry-ready individuals. But how can we generate the infrastructure to provide practical learning platforms to millions of youth? This problem can be solved by targeting the local market and local issues as living laboratories for training. This will reduce the need of mobility of skilled workers and empower them to contribute as clusters to local and neighbouring organizations and industries.

For example, if a given city is declared a "smart city" with a very high possibility of skilled workers to be engaged and employed, the development plan should be linked to skilling courses and vocational programmes. It is also clear that the manpower requirements with new technologies, associated services, and facilities create opportunities for the work force to be employed.

Innovative start-ups like Swiggy or Zomato, both online restaurant aggregators providing a platform for placing orders for deliveries and for reviews, create the need for skilled workers, giving a boost to restaurants and related jobs in the city. Such creative business and entrepreneurial models when brought to rural landscape can generate the need for skilled workers and provide opportunities for local villages and their cottage industries. The possibility of starting market need-based business will act as drivers for future skilling and vocational programmes. This emphasizes the importance of linking local educational institutes with skilling so that the pathways for skilling, reskilling, and upskilling can be opened for all and can promote such programmes.

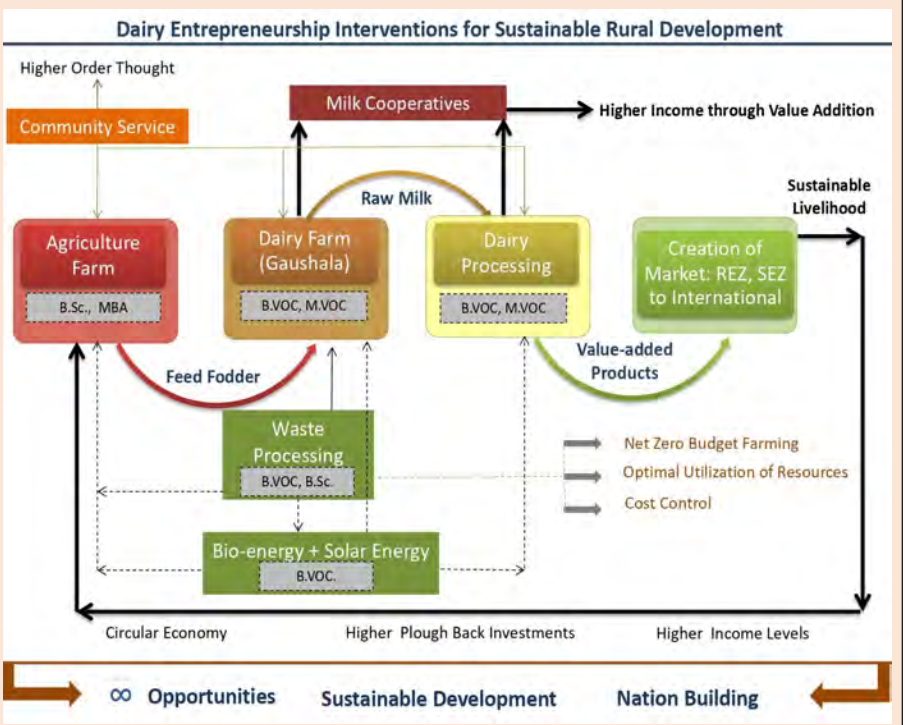
By promoting in-situ marketing counters at educational campuses, entrepreneurship can increase dramatically. Students can first get the market among their friends and colleagues within their campus. These kinds of activities teach students about quality, standardization, and values. Further improvement in products and services can make the difference with frank feedback from the student communities. Such activities, when promoted under the supervision of teachers, can result in innovative, economical, and optimal resource utilization. Later, if resource centres are opened in and around educational institutes, involving village panchayats and rural markets, the concept of REZ to international markets will become a success story.

The participation of villagers develops a conducive market for budding entrepreneurs and also provides several opportunities for socio-economic

transformation that will lead to a change in the quality of life. Examples of systems model for integration of education, skills and vocational programmes for building rural economy are given for Dairy Entrepreneurship in Box 4 and for Apparel and Toy Making in Box 5.

2. Content Availability in Local Languages

Box No. 4: Systems Approach to Rural Development through Dairy Entrepreneurship



A sustainable intervention for rural development focusses on diversification of the livelihood sources of the farmers to include non-farm sources of income. There are many integrated models of academics, skilling and entrepreneurship that lead to creation of sustainable rural economies, one of them is in the area of dairy.

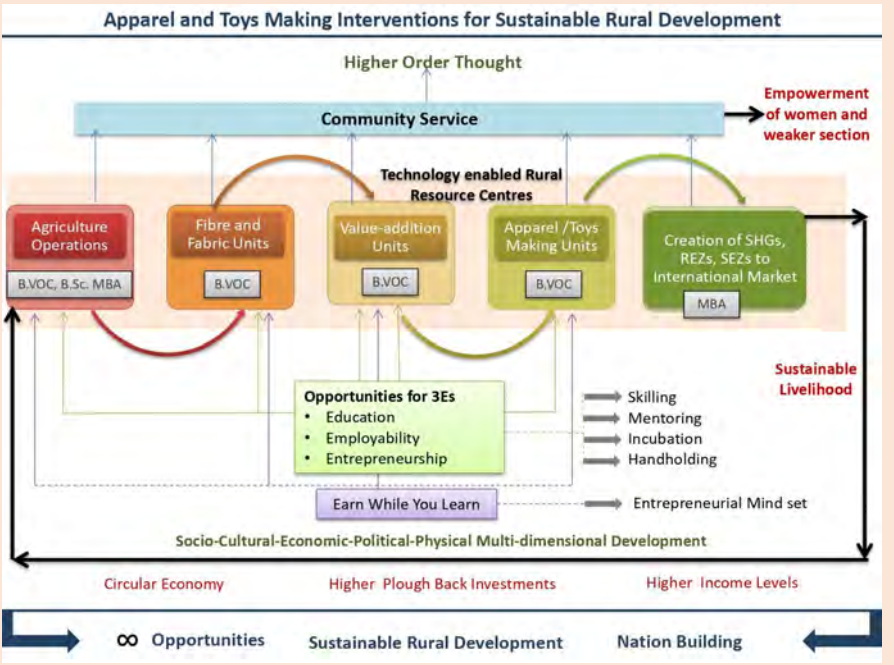
The village-level dairy entrepreneurship model integrates agriculture operations, dairy farming, waste management, dairy processing technologies, value-addition, marketing facilities and the creation of linkages between Rural Economic Zones (REZs), Special Economic Zones (SEZs), and international markets.

At every stage opportunities for skilling, vocational education (B.Voc., M.Voc.) and entrepreneurial incubation are available to the students and farmers, with financial support systems like "earn while you learn" scheme. Waste management techniques support net zero budget farming.

This is a classic system of linking local network to education network in promoting skilling, benefits to farmers and sustainable livelihood for rural population

Contributed by: D. Sumir, K. Srinivas & Soami Piara Satsangee, DEI

Box No. 5: Systems Approach to Rural Development through Apparel and Toy Making



One of the sustainable rural development model is in the field of apparel and toy making, where natural fibres can be produced through agricultural operations and converted into fabrics, which are thereafter dyed with natural colours. Value addition-based techniques like embroidery, printing, painting, followed by conversion of selected range of fabrics into apparels and toys can lead to the creation of rural to national to international level markets.

Self-help groups (SHG) created at rural zones would bring in sustainable livelihood for women leading to a higher income level. With an assured quality of the produce, the market of items can lead to creating SEZs not only within the country but also at international level. The village-level technology-enabled community resource centres provide skilling and entrepreneurial opportunities right from growing the input raw material in agriculture fields to operating fabric production looms, apparel manufacturing, designing, packaging and marketing.

B.Voc. and M.Voc. programmes in the area of textiles and garment manufacturing, waste management, renewable energy become the integral part of such models, benefit the local communities but also provide labs on the land for the students. Hence vocational education can easily lead to employability, which in turn would encourage entrepreneurial efforts by setting up small units.

Contributed by: Sangita Saini and D. Sumir, DEI

Language plays an important role in communicating ideas and networking with peers and mentors. The curiosity over vocational skills may be aroused early but skilling in the true sense starts only after class 8. Students at this age and beyond are more comfortable in communicating, thinking, sharing, and learning in the local language. Most of the peers, who are the real motivators

and role models for students also speak in the local language. Interaction with industry and stakeholders at this level should be in the local language, thus promoting networking and experience sharing at the grass-root level. With a heterogenous set of languages available, the content for skilling and vocational programmes needs to be prepared in local languages to foster learning and practising skills in an unprecedented way, as the innovation and creativity at this age will be higher in local language.

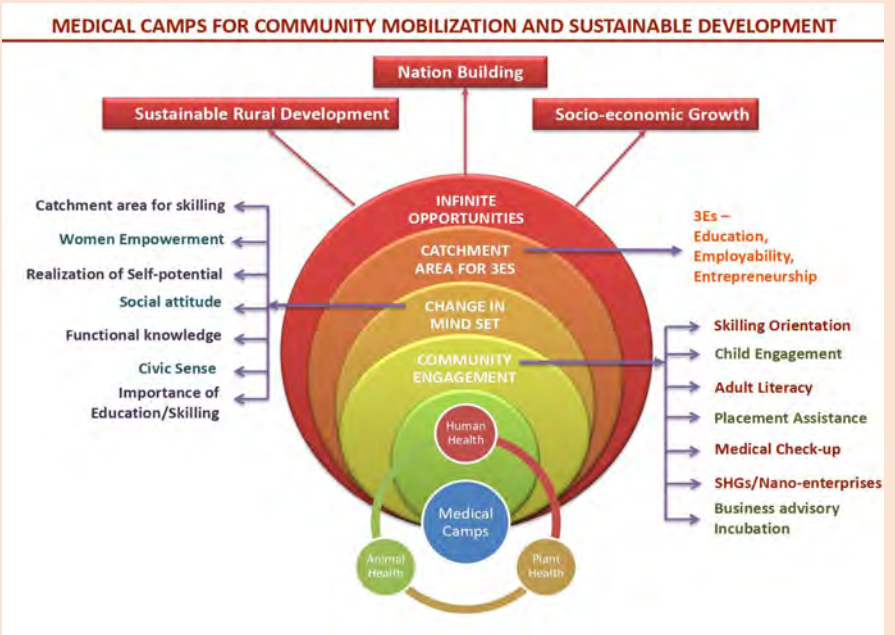
3. Creating Catchment Area for Youth

The vision of empowering India's youth takes a back seat in the present scenario when even in the 21st century, a large number of communities and families remain indifferent to the power of education. The fault lies in the absence of flexibility and adaptability in the education system and its inability to accommodate the needs and aspirations of the individuals, whose basic necessities even are not fulfilled. Thus this ultimate challenge of connecting children, youth, and adults and bringing them out of the closed doors and existing unskilled professions is the pivotal point for success. The initiative that organizations, institutes, communities, and individuals take is the first step of the self-energising cycle of initiative, creativity, and innovation leading to excellence with relevance. Until we bring each child and youth on the path to excellence we are depriving them of the opportunity to lead a purposeful life and contribute to national and social development.

The challenge of the low mobilization of students in skilling and vocational education can be addressed by organizing institute activities in a manner that they create a neighbourhood catchment area for youth. This can be done by leveraging the potential of existing social interaction platforms such as National Service Scheme (NSS) and Unnat Bharat Abhiyan (UBA), and also novel platforms such as medical camps (see Box 6) and unrestricted on-campus visits of the community on "Open Day", to popularize the skill and vocational programmes. The endeavour to make the youth aware of the skill development programmes must be carried rigorously across all media, like a national mission, so that no one is left behind from availing the opportunity.

Besides increasing the awareness of skilling and vocational programmes and the gross enrolment ratio (GER) in education the larger picture is changing the mindset of individuals and exposing them to their capacities and the possibilities to transform their lives. This can be termed as a "hole in the wall" approach where institutes create a window for children and youth from underprivileged sections of society, to organize activities which give them the

Box No. 6: Medical Camps: Skilling and Creativity Hub for Education, Medical and Entrepreneurship (SCHEME)



Medical camps provide necessary healthcare services to the weaker sections and also create a platform for interaction with local communities, building trust, creating the willingness for change, knowledge orientation, counselling, and mentoring. These camps expand beyond their traditional definition and create a multi-dimensional community impact, causing early prevention of diseases, improvement in the health indicators of the community, and act as catchment area for youth where they get oriented to skilling and employment opportunities.

The medical camps comprise several activities for children, like recreational centres, hole in the wall (computer-based learning), interest and aptitude identification and for youth activities across skilling, English speaking, literacy, and career counselling are planned. Advise is given by experts for crop and animal health, farming, SHGs creation, business and nano-enterprise setup. This helps in attracting students and out-of-school children/youth, enhance their functional skills, tap their aptitude, motivate them to explore avenues for improving quality of life.

Opportunities thus created and availed by a few in the beginning has demonstrated that over a period that numbers grow exponentially. This is a unique working model of community engagement that creates infinite opportunities through the 3Es — Education, Employability and Entrepreneurship, empowering young women, under-privileged and unserved people.

Contributed by: A.S. Ragini and Shalini Nigam, DEI

immersive experience of a world beyond what they have seen and believe exists. This would be in sync with social responsibility and community engagement of educational institutes in opening avenues for infinite opportunities for learners by motivating them to explore the options for a better future and take rational decisions.

CONCLUSION

Skilling and vocational education have a vital role to play in transforming India and lives of millions of youth residing there, but first the nature of educational institutes needs to transform. The social stigma attached to skilling and vocational programmes can be detached by establishing vertical and lateral connections of these programmes with general education and technical education. Multiple entry exit opportunities with 'practice-learn-earn' loop can add significant value to the lives of students who are initially not motivated and reluctant to pursue such courses, and also pave the path for dropouts to enter in skilling and vocational programmes without any difficulty.

A well designed integrated curriculum can motivate learners to create growth paths for themselves by preparing them in functional learning, innovation and creative solutions. Steadily they can network and evolve Self-Help Groups and create organizations by getting experience of growth for themselves and others. Thus, skilling and vocational programmes need to be viewed as a source of financial stability and opportunities to grow personally and professionally in terms of employability, education, and entrepreneurship, way beyond than what conventional path offers.

Finally, it is not simply the skilling that we seek. The youth of today need to think for themselves, about the quality of life they lead, their values, their families, the society, and the environment. Skilling and vocational education programmes should simply not train the youth in skills but make them evolve into better humans who lead a life of purpose. As only the informed and thoughtful citizens can contribute to building our nation.

ACKNOWLEDGEMENTS

The authors acknowledge the contribution of a large number of faculty members from DEI for the generation and implementation of ideas mentioned in the chapter. Authors of the paper have compiled information and have given interpretations based on the systems approach to design a model for national relevance. The authors appreciate and are thankful to all the coordinators who are running the vocational and skill programmes at various levels and have readily shared their experience to enrich this content.

Endnote

Readers could visit www.dei.ac.in for reading the white papers on *Vocational and Skilling and Systems Thinking in Education.* Examples included in these papers illustrate the creative and innovative concepts mentioned here**.**

NATIONAL EDUCATIONAL POLICY-2020
A Mandate for Quality Higher Education in India

M.K. Sridhar and Chetan Singai

CURRENT SCENARIO: HIGHER EDUCATION IN INDIA

The key results of the All India Survey on Higher Education 2018-19 published by Ministry of HRD (MHRD), Government of India reveals that there are 993 Universities, 39,931 colleges and 10,725 stand-alone institutions (MHRD, 2019). According to the AISHE-2019, the number of colleges per one lakh of the eligible population in the age group of 18-23 varies from seven in Bihar to 53 in Karnataka, as compared to All India average of 28. About 60.53 per cent of colleges located in rural areas and 16.3 per cent of the colleges have an enrolment of less than 100 and only 4 per cent of colleges have an enrolment of more than 3,000. The total enrolment in higher education is estimated to be 374 lakhs out, of which 49 per cent constitute female (MHRD, 2019). Currently, the Gross Enrolment Ratio (GER) is 26.3. About 79.8 per cent of the students are enrolled in the undergraduate programs, out of which maximum number is enrolled in the BA program, i.e., 39.5 per cent of the total students (*ibid.*). Around 47,427 international students from 104 different countries are studying in India. The total number of teachers is 14,16,299 (*ibid.*). The Pupil-Teacher ratio (PTR) in Universities and Colleges is 29; nearly 41,000 students were awarded PhD degrees in 2018 (*ibid.*).

As India moves towards becoming a true knowledge society and because of the imminent fourth industrial revolution (Sharma, 2017), the Higher Education System (HES) in India faces several challenges. Some of the key challenges are the fragmentation of the system; too many silos; too much early specializations; lack of access in socially-economically disadvantaged areas/sections; lack of autonomy for teachers and institutions; sub-optimal governance and leadership; a regulatory system, which allows fake colleges on the one hand and constrains excellent institutions on the other. All these challenges would have a negative bearing on the quality of institutions resulting in a system that is not very qualitative.

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QUALITY THRUST IN HIGHER EDUCATION

The National Education Policy-2020 (NEP-2020) is grounded on the principles of Access, Equity, Quality, Affordability and Accountability (Ministry of Education, 2020). It highlights the fact that education in the country must be considered — a single organic continuum from Early Childhood Education to Higher Education (*ibid.*). In the decades since Independence, we have been mainly preoccupied with issues of access and equity and unfortunately, have dropped the baton regarding the quality of education (Ramaprasad *et al.,* 2016).

In this backdrop, the NEP-2020 provides a 'new' and 'forward-looking' vision for India's HES and its quality. The policy emphasizes on:

- Moving towards a more holistic undergraduate education;
- Enabling faculty and institutional autonomy;
- Revamping of curriculum, pedagogy, assessment and student support;
- Reaffirming the integrity of faculty positions and institutional leadership;
- Establishing a National Research Foundation (NRF);
- Enabling increased access, equity, and inclusion through a range of measures, including greater opportunities for outstanding public education;
- Moving towards a more multidisciplinary undergraduate education;
- Providing all infrastructure and learning materials accessible and available to learners with disabilities;
- Ensuring governance by independent boards with autonomy;
- Ensuring a substantial increase in public investment in education by both the Central government and all State Governments;
- Enforcing 'light but tight' regulation by a single regulator for higher education; and
- Moving towards a HES consisting of large, multidisciplinary universities and colleges.

In this backdrop, the NEP-2020 proposes to revise and revamp all aspects of the education structure, including its regulation and governance, to create a new system that is aligned with the aspirational goals of 21st-century education.

Quality Universities and Colleges

Given the requirements of the 21st century, quality university or college education must develop competent, well-rounded, and creative individuals. It must enable students to study one or more specialized areas of interest at a deeper level, and simultaneously build character, ethical and constitutional values, intellectual curiosity, and the spirit of service. Quality higher education must enable personal accomplishment and enlightenment, constructive public engagement, and productive contribution to society and the nation. It must also prepare students for more meaningful and satisfying lives and work roles and enable economic Independence.

The NEP-2020 recognizes the need for large and multidisciplinary universities and colleges, to address the challenge of the fragmentation of higher education. Such a system will enable students to become well-rounded, ensure holistic growth, optimally develop both sides of their brains (artistic/creative and analytic), and induct flexibility and dynamism into their learning programmes. The system will help to evolve a robust culture of research and innovation in universities and colleges.

The purpose of quality of higher education is more than just creating additional and significant opportunities for the employability and employment of individuals. It must ensure a more vibrant, socially engaged, and cooperative communities and a happier, cohesive, cultured, productive, innovative, and prosperous nation.

BETTER REGULATION AND GOVERNANCE

Improving quality is one of the areas of interest, as highlighted by most of the erstwhile policies and reports on higher education (Tilak, 2013). However, there have been limited changes in the overall quality, creating a gap between the state-of-the-aspiration of the policies and the state-of-the-practice within Higher Education Institutions (HEIs). Arguably, such a gap arises due to ineffective the regulatory ecosystem, which limits autonomy, innovation and effective outcomes (Altbach, 2009). To overcome such limitations, overhauling the regulatory system is inevitable and the need-of-the-hour. The NEP-2020 provides a detailed proposal to reform the regulatory system by establishing four autonomous institutional structures carrying out four essential functions of regulation, accreditation, funding, and academic standard-setting under one umbrella institution - the Higher Education Commission of India (HECI). Such a move not only brings professionalism and expertise into each of the

function but prevents the vested interest if concentrated into one regulatory body as such. Further, the NEP-2020 recommends strengthening and empowering the Central Advisory Board of Education (CABE). The CABE will develop, articulate, evaluate and revisit the vision of education in the country on a continuous basis, in close collaboration with the Ministry and the corresponding apex bodies of States. It shall also create and continuously review the institutional frameworks that shall help attain this vision.

At the micro-level, every higher education institution needs to have an independent board with an Institutional Development Plan (IDP). According to NEP-2020, all HEIs shall prepare their IDPs with the joint participation of Board members, institutional leaders, faculty, students, and staff. The IDPs to illustrate the short-term, mid-term and long-term goals of institution to achieve excellence in teaching, research, and service. For example, the IDPs are supposed to provide a roadmap to attain the highest level of accreditation over the next 15 years and thereby eventually aim to function as self-governing degree-granting institutions/clusters.

NEW ACADEMIC ARCHITECTURE

The NEP-2020 recommends that all undergraduate and graduate programmes be developed on an underlying foundation of holistic education, which enhances the intellectual, social, ethical, analytical, and aesthetic capacities of all students. Such a transformation will help connect university research and graduate programmes with holistic ethos to conduct higher quality, more relevant, and interdisciplinary research. It places the highest emphasis on moving to large multidisciplinary universities with autonomy and flexibility. The ancient Indian universities of Takshashila, Nalanda, Vikramshila and Vallabhi had thousands of students from India and the world studying in such vibrant multidisciplinary environments. Similarly, modern universities today, amply demonstrate the great success that such large multidisciplinary research universities can bring. According to the NEP-2020, the main thrust of this policy regarding higher education is to end the fragmentation of higher education by transforming higher education institutions into large multidisciplinary universities, colleges, and HEI clusters/Knowledge Hubs by 2040.

To this end, the NEP-2020 recommends three types of institutions based on a difference in focus:

- Research-intensive universities;
- Teaching-intensive universities; and
- Degree-granting autonomous colleges.

The most salient marker for these categories of institutions will be the focus of their goals and work. To initiate such efforts towards such institutions, a stage-wise mechanism for granting graded autonomy to colleges, through a transparent system of graded accreditation, will be established. Colleges will be encouraged, mentored, supported, and incentivized to gradually attain the minimum benchmarks required for each level of accreditation. The NEP-2020 envisages that over a period, every college would develop into either an Autonomous degree-granting College or a constituent college of a university. With appropriate accreditations, Autonomous degree-granting Colleges could evolve into Research-intensive or Teaching-intensive Universities, if they so aspire.

EXCELLENCE IN TEACHING AND RESEARCH

According to the NEP-2020, teachers and faculty are at the heart of the learning process – their recruitment, continuous professional development, positive working environments and service conditions are an important aspect of quality and excellence in higher education. The policy further states that it is critical to empower the faculty with high competence and deep commitment to energize them for excellence in teaching and research. It recognizes that the most crucial factor for the success of higher education institutions is the quality and engagement of its faculty. Hence, the NEP-2020 makes critical interventions in reforming the current state-of-affairs to energize and engage faculty members towards excellence in teaching and research. It recommends:

- All HEIs will be equipped with basic infrastructure and facilities. Every classroom to have access to the latest educational technology that enables better learning experiences;
- Teaching duties to be rationalized and to enable effective teacher-student ratio so that there is adequate time for interaction with students, conducting research, and other university activities;
- Provide utmost autonomy to faculty to design their own curricular and pedagogical approaches within the approved framework, including textbook and reading material selections, assignments, and assessments;
- Build appropriate incentives through rewards, promotions, recognitions, and movement into institutional leadership. Whilst hold faculty accountable for not delivering basic duties/functions;
- Implement a permanent (tenure) employment track for university staff, including faculty.

- To drive excellence, HEIs will have clearly defined, independent, and transparent processes and criteria for faculty recruitment; and
- Identify and recognize excellent faculty with high academic and service credentials as well as demonstrated leadership and management skills for leadership positions within the institution.

The NEP-2020 envisions a higher education ecosystem wherein each faculty member is happy, enthusiastic, engaged, and motivated towards advancing her/his profession and institution towards quality and excellence, by effectively implementing the above recommendations.

CATALYZING RESEARCH AND INNOVATION

The NEP-2020 has a strong emphasis on catalyzing and energizing research and innovation across the country in all academic disciplines with a focus on state universities and colleges. At the systemic level, research and innovation make a substantial contribution in enhancing the state-of-the-art research ecosystem of international repute. Such an ecosystem is critical for the HEIs to enhance their research productivity. This is an important consideration for international and national rating, ranking and accreditation process. At the macro level, such an ecosystem is central to growing and sustaining a large and vibrant knowledge society. Research and innovation at education institutions in India, particularly those that are engaged in higher education, is critical.

To make this a reality, the NEP-2020 envisions establishing a National Research Foundation (NRF). Its overarching goal is to build a culture of research to permeate through the universities. The overarching goal of the NRF will be to enable a culture of research to permeate through our universities.

The primary activities of the NRF will be:

- Fund competitive, peer-reviewed grant proposals of all types and across all disciplines;
- Seed, grow, and facilitate research at academic institutions, particularly at universities and colleges where research is currently in a nascent stage, through mentoring of such institutions;
- Act as a liaison between researchers and relevant branches of government as well as industry, so that research scholars are constantly made aware of the most urgent national research issues, and so that policymakers are constantly made aware of the latest research breakthroughs; so as to allow breakthroughs to be optimally brought into policy and/or implementation; and

- Recognize outstanding research and progress.

In sum, the NRF will provide a reliable base of merit-based but equitable peer-reviewed research funding which will help to develop a culture of research in the country through "suitable incentives for and recognition of outstanding research.

CONCLUSION

The NEP-2020 addresses the quality of higher education in its entirety and in a holistic manner; not in an ad-hoc or piecemeal manner. Policy recommendations range from a systemic level to an institutional level. The policy considers quality issues in higher education in an inclusive manner. Let us hope and wish that the proposed NEP-2020 ushers in an era of quality revolution in the universities and colleges of India, which is the crying need of the hour.

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Back Cover :

The 'Portrait of UGC' is a painting made by Prof. Him Chatterjee, Himachal Pradesh University

This portrait of the University Grant Commission is a reflection of education Philosophy from Indian traditional Knowledge systems. The Orange colour scheme represents Knowledge. The Swan represents Goddess Saraswati spreading wings of Knowledge. The National emblem-the lion capital and Dharma Chakra signifies moving forward and Buddhi, with the open books below is the emblem of UGC. Two eyes of Owl below signifies the Goddess Laxami and Ghara represent Grant. The GYAN CHAKRA – to SAHASRARA CHAKRA-transcends Knowledge and Energy of Consciousness-Darshan. The Painting depicts array of logical and analytical disciplines through left brain and Creative and Artistic disciplines through Right brain. The 12 zodiac signs at foreground symbolise 12 different characters, thoughts and opinions. Each Head with own world and question marks on eyes representing the importance of inquiry and quest in education and research.

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ज्ञान–विज्ञान विमुक्तये

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