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Special Issue

on

CURRICULUM FOR A HOLISTIC AND MULTIDISCIPLINARY TRANSFORMATIVE HIGHER EDUCATION

on the occasion of

AIU CENTRAL ZONE VICE CHANCELLORS' MEET–2022-23

hosted by

SYMBIOSIS UNIVERSITY OF APPLIED SCIENCES, INDORE

(January 17-18, 2023)

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Conceptualising Central Zone Vice Chancellors' Meet on Transformative Curriculum for a Holistic and Multidisciplinary Higher Education

Pankaj Mittal* and Sistla Rama Devi Pani**

A strong system of higher education is a significant contributor to the country's ability to compete in the global marketplace and is critical to economic strength, social well-being, and position as a world leader. being the enablers of change in society, HEIs are under increasing pressure to show their societal relevance. Higher education and knowledge are simultaneously global, national, and local with tremendous capacity to influence economies and societies across the world. With the development of the knowledge economy, the impact of higher education is crossing the regional and national borders and percolating to global societies and therefore the cross-border or global dimension of higher education is growing. Indian higher education, on one hand, strives for excellence and on the other, it must ensure inclusion. Emphasis is rightly placed on how higher education can better serve society, foster the economic development of nations, and promote cultural diversity, political democracy, and trade and international cooperation. External pressures manifest themselves in a variety of forms, among them, shifts in the economy and the nature of the labor market, demographic trends and the demands and expectations of interest groups, and an instrument for reaching certain societal agendas. To fulfill all these requirements, Higher Education Curricula play a vital role. The Government of India has recently come out with the new National Education Policy 2020 to rejuvenate the education system and make it. The NEP-2020 Report contains very pertinent and tangible recommendations on the curriculum needed for the present Indian higher education courses.

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

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

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and Transformative Pedagogies. Transformative education equips learners with the core knowledge, values, attitudes, and skills needed to address pressing local and global challenges in addition to preparing them to contribute to a more just, inclusive, diverse, equitable, secure, and sustainable future for all.

Transformative Higher Education *can be construed as higher education that empowers learners to be reflective and critical thinkers and committed tech-savvy individuals who are able to contribute meaningfully to the local and global communities.*

In order to guide and support the Indian HEIs in imparting state-of-the-art Transformative Higher Education to the students, AIU as a representative body of HEIs in India has set out to organize all the Zonal and National Vice Chancellors Conferences in 2022-23 on the theme*:* ***Transformative Higher Education for Atmanirbhar Bharat.***

In Zonal Vice Chancellors Meets, themes on different essential aspects of teaching-learning in the light of Transformative Higher Education will be discussed exclusively.

a. *North Zone*: Internationalization for Transformative Higher Education

b. *East Zone*: Pedagogies and Use of Technologies for Transformative Higher Education

c. *Central Zone*: Transformative Curriculum for a holistic and Multidisciplinary Higher Education

d. *South Zone*: Research and Excellence for Transformative Higher Education

e. *West Zone*: Evaluation Reforms for Transformative Higher Education

The Present Meet

The present Meet is the East Zone Vice Chancellors' Meet. The theme for this Meet is ***'Transformative Curriculum for a Holistic and Multidisciplinary Higher Education'***

A curriculum is the combination of instructional practices, learning experiences, and student performance assessments that are designed to bring out and evaluate the target learning outcomes of a particular course. The curriculum is a "key driver" in the success of any course or programme. Most importantly, the admission of the student and retention of students without many dropouts depends upon the relevance, utility, and interest generated through the curriculum. All these days, universities used to create curricula for the specific population of students pursuing the course through traditional mode. But today, the needs are continuously changing due to several reasons. Education is now without borders. Technologies' impact on teaching and learning is very significant. Online learning opportunities are becoming popular which requires new dimensions in the curriculum.

Ensuring Graduate Employability and producing entrepreneurial graduates is one of the universal benchmarks of quality and success in any higher education programme. The graduate skills gap, fast-evolving global job markets and students' priorities make a compelling case for embedding employability and entrepreneurship in higher education curricula. Rapid technological progress, as well as a changing work environment, have a continued impact on working practices and the specific skills required in various disciplines. Our ability to weave employability and entrepreneurship into the curriculum and assessment process is also one of the indicators of 21st-century programme planning. It also catalyzes the Academia-Industry-Society interface.

The Indian Knowledge System has gained immense popularity across the world for its richness, relevance and contribution to the development of the modern education system. Modern global education and science particularly the fields of forests, agricultural biodiversity, inland waters, coastal and marine ecosystems, rangelands and eco-tourism, mathematics, linguistics, astronomy, metallurgy, civil engineering, medicine, etc. can significantly gain from the Indian knowledge system. Decades of negligence towards the Indian Knowledge System and the trend of considering western criteria as the sole benchmark of knowledge development have brought threats to the sustainability of life itself on the planet. It is high time that the Indian Knowledge System becomes an integral part of all the disciplines taught in Indian Universities, to begin with. It will definitely be adopted by other countries in course of time.

National Education Policy–2020 too envisaged promoting Holistic and Multidisciplinary Education

at the higher education level with an aim to develop diverse capacities of human beings including intellectual, aesthetic, social, physical, emotional, interpersonal, humanistic, and moral capacities in an integrated manner. The fact that NEP 2020 advocates a good education system to provide knowledge of 64 kalas or arts and eliminate rigid boundaries between disciplines makes it all the more important to integrate the Indian Knowledge System into the Curriculum of Higher Education Programmes to make it holistic and multidisciplinary.

Due to all these, there is pressure on curriculum developers to fulfil a wide range of needs of students and to ensure varied dimensions to cater to the needs of the 21st century. The best solution to address this multifaced issue is to induce the concept of a Transformative Curriculum in higher education.

Transformative Curriculum for Holistic and Multidisciplinary Higher Education interweaves multiple perspectives and integrates students' needs and knowledge into the learning process through Diversity Blueprint and the Diversity Requirement for the instructors to create a thoughtful and equitable space for wholistic learning in the students.

The discussions will primarily focus on the framework, design, and components of transformative curriculum; address key issues in designing the curriculum; professional skills to design, implement, and monitor transformative curriculum; share relevant innovative and best practices, case studies, and lessons in curriculum designing; ways to enable educational leaders, educators, policymakers, and other stakeholders to unlock and utilize the potential of transformative curriculum to promote Holistic and Multidisciplinary Higher Education.

The two-day event will include the following 3 Technical Sessions to discuss the concerned topics:

Technical Session--1: Outcome-Based Learning

Technical Session-2: Academia-Industry-Society Interface

Technical Session-3: Integrating the Indian Knowledge System through the Multidisciplinary Teaching Learning process

Format and Approach

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

Session Details

Technical Session-1: Outcome-Based Learning

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

Thus, for outcome-based learning, a certain framework model must be developed and followed; the first step is to identify desired outcomes, design an outcome-based curriculum, adopt and use appropriate teaching-learning pedagogical tools, and design suitable assessments to measure the attainment of the learning outcomes. NEP-2020 also emphasized Learning-Outcomes-Based Higher Education.

However, some educationists also argue that the blind application of OBE to Indian universities for all subjects will be detrimental to the intellectual capacity of the country due to inherent limitations. Providing a free, fair, and creative environment is very necessary to achieve the objectives of education; instead of a top-down OBE approach.

In this session, the deliberations will be on developing Outcome Based Learning methods.

Technical Session-2: Academia-Industry-Society Interface

Collaboration between industry and academia is key to innovation and growth in technology. Industry partnerships are instrumental in advancing research in universities and creating a skilled workforce. Strategic industry-university research collaborations provide a myriad of benefits to their participants. For academics, these benefits can include the opportunity to address challenging research questions with real-world applications, see their research have tangible impacts, and gain access to new skills, data, or equipment. Industries can improve performance by developing new techniques or technologies, de-risk investment in research, and extending the capabilities and expertise available to the industry. Industry gains work-ready talent with specialist knowledge and practical training, and universities benefit by having opportunities to work on relevant technologies and challenging problems.

While industry often focuses on addressing solutions that are of near-term commercial value, academia focuses on building new knowledge through research; imparting education to students; and engaging with communities to extend the outcomes of research and innovation to society in general. Universities are realizing more and more that they need a way to make their findings more socially relevant by establishing Academia-Society Interface. Which is commonly called Community Engagement.

Under Academia-Society Interface, the focus is on opportunities for faculty, staff, and students to foster learning beyond the classroom in the form of service-learning, community-based engagement, internship opportunities, community-engaged undergraduate research, engagement scholarship, etc. It is a collaboration between institutions of higher education and their larger communities ---local, regional/state, national, and global, for the mutually beneficial creation and exchange of knowledge and resources in a context of partnership and reciprocity. The purpose of community engagement is the partnership (of knowledge and resources) between academia and the public and private sectors to enrich scholarship, research, and creative activity; enhance curriculum, teaching, and learning; prepare educated, engaged citizens; strengthen democratic values and civic responsibility; address critical social issues, etc. The *Unnat Bharat Abhiyan* of the Ministry of Education which is being steered by IIT, Delhi is a very effective programme to connect Universities to Society.

It is obvious that both Academia and Industry have the responsibility to cater to society through mutual linkages and thus, all three ie. academia, Industry, and Society need to interface from time to time to understand the needs of each other. This tripartite combination or collaboration can yield accelerated development of new breakthroughs. Three-way partnerships between Industry-Academia-Society can be called the Triple Helix Model of collaboration.

Often governments play a role in these types of collaboration. As India ushers in the era of Make in India, Startups, etc., it is in the advantaged position of having young graduates ready to apply their learnings in key fields to solve major challenges faced by industries as well as society. The involvement of the Government of India has also been increasing significantly. *The Framework of Industry-University Linkage in Research* — released in 2019 by the Ministry of Science and Technology, Government of India — found that though industry and academia work in tandem, the lack of a clear policy is preventing optimum cooperation. The report determined that a strong industry-academia collaboration with a focus on innovative ideas and R&D investment can help increase research capacity and enrolments in Ph.D programmes.

In this session, there will be deliberations on Academia-Industry Collaboration; Academia-Society Collaboration, and Academia-Industry-Society Collaboration; Need for such Collaborations; How to ensure effective collaborations; the Need for Policies on such collaborations, etc.

Technical Session-3: ***Integrating the Indian Knowledge System through the Multidisciplinary Teaching Learning Process***

National Education Policy--2020 envisaged promoting Holistic and Multidisciplinary Education at the higher education level with an aim to convert all streams of education into multi-disciplinary forms to produce multi-dimensional well-rounded individuals equipped with all types of knowledge, skills, competencies, and know-how about life, people, places, arts, sciences, languages, and technologies, etc.

Apart from building capacities, enhancing abilities, shaping attitudes, promoting aptitude and proficiency, and improving motivation and efficiency, multi-disciplinary education builds the character, persona, intellect, physique, positive insights, and outlooks of learners and transforms them into ethical, rational, compassionate and caring citizens, while at the same time prepare them for rewarding and contributing employment that enables them to leave a rich legacy behind and pay back to the society in one positive form or the other. This type of education will help develop versatile and well-rounded individuals who are well-equipped with twenty-first-century skills and capacities in diverse streams.

The NEP-- 2020 also recognizes the distinct place that India holds on to the global stage. It maintains that India is a treasure trove of culture, developed over thousands of years and manifested in the form of arts, works of literature, customs, traditions, linguistic expressions, artefacts, heritage sites, and more. Its cultural developments, civilizational values, and rich literature in all the fields are incomparable. India has much to offer to the world from its glorious past. It is always looked up to for its spiritual and transcendental knowledge. Thus, the promotion of Indian arts and culture is important not only for the individual and the nation but also for the world. Therefore, all curricula, pedagogy, and teaching-learning systems need to be integrated with strong roots of the Indian culture, traditions, heritage, customs, language, philosophy, geography, ancient and contemporary knowledge, societal and scientific needs, indigenous and traditional ways of learning, etc. A curriculum of this nature would ensure that education is relatable, relevant, interesting, and effective for students. It will also lead to strong identity formation, and develop a sense of belongingness and pride in the students. This is essential for the students to contribute towards national development.

Thus, developing a quality curriculum fulfilling the diverse needs of students is an extremely daunting task and therefore, the need of the hour is to have a Transformative Curriculum to impart Holistic and Multidisciplinary Higher Education. In this session, there will be deliberations on Integrating the Indian Knowledge System through the multidisciplinary Teaching-Learning process; exploring the strategies to ensure that the pertinent Indian Knowledge is integrated into the curricula of all the disciplines of higher education and various other issues related to the theme of the session.

Participation and Organization

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

Symbiosis University of Applied Sciences, Indore : A Profile

Symbiosis University of Applied Sciences, Indore is hosting the Association of Indian Universities Central Zone Vice Chancellors' Meet − 2022-2023 on January 17-18, 2023.

Symbiosis University of Applied Sciences, Indore (SUAS) is a self-financed University established vide Government of Madhya Pradesh Gazette (extraordinary) No 2 of 2016 dated 13 June 2016, under provisions of the Madhya Pradesh Niji Vishwavidyalaya Adhiniyam, 2007. It has been established under the able leadership of Dr. S. B. Mujumdar, President and Founder, of Symbiosis, and Dr. Swati Mujumdar, Vice President, Symbiosis Foundation.

It is India's First Skill University. Uniquely designed Undergraduate, Post-graduate, and 5 years Integrated Programmes in high-growth sectors like Banking, Financial Services, Insurance Management, Marketing, Retail and E-Commerce, Logistics & Supply Chain under the Management stream. Computer Science and Information Technology, Data Sciences, Mechatronics, and Automobile under the Engineering stream. The University ensures learning by doing with 70% focus on Skill and Practical learning and 30% focus on Theory-based learning.

The University provides 18 Skills-based certifications from IBM, TCS iON, Google, Microsoft, Deloitte, NISM, Simplilearn, CFI- USA. 24 Virtual internships/Live projects/ Virtual experience certifications from HSBC Bank, Citi Bank, J.P. Morgan, Future Impact, Fidelity International KPMG, PwC.

Symbiosis University of Applied Sciences, Indore was established with the active collaboration of leading industries and Universities from Germany and the USA.

With an investment of over Rs 200 crores, Symbiosis has created; a state-of-the-art infrastructure spread over 25 acres. Academic buildings, Finance Training Plaza, Mock Bank Training, Retail Lab, hostels for boys & girls, Centre of Excellence, specialized training labs and workshops, and the School of Interdisciplinary Sciences are a hallmark of this University.

Symbiosis, Indore has imported specialized skill training machinery from Germany to impart hands-on practical training to its students.

The Association of Indian Universities

The Association of Indian Universities (AIU), is one of the premier apex higher education institutions of the Country established in 1925. It is a research-based policy advice institution to the Government of India in the field of Higher Education, Sports, and Culture. Since its inception, it has been playing a vital role in shaping Indian higher education. Most importantly, AIU is vested with the power of according equivalence to Degrees/Qualifications offered by the universities across the world with those offered in India. AIU has also been mandated by the Department of School Education, Ministry of Education, Government of India to accord equivalence to the Indian Boards for the Secondary/ Senior Secondary Examination vide Gazette Notification. AIU is a think tank body with the responsibility of undertaking academic activities such as: conducting Research Studies in higher education; acting as the bureau of information on higher education; liaising with international bodies and universities for the internationalisation of Indian higher education among many others. AIU conducts inter-university sports and cultural events at national and international levels. As a National Sports Promotion Organization (NSPO) it promotes sports among Member-Universities and maintains the standards in sports.

Being an apex advisory institution, it constitutes an integral part of all major decision-making committees and commissions in the country. As a representative body of Indian universities, it facilitates cooperation and coordination among Indian universities and liaises between the universities and the Government (Central as well as the State Governments) and also National and International bodies of higher education in other countries in matters of common interest. Whereas all the Indian universities benefit from its contribution, at present it has a membership of about 898 universities including 14 overseas universities from other countries viz. Bhutan, UAE, Kazakhstan, Mauritius, Malaysia Nepal, as Associate Members.

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

Partners in Development and Helping India Regain its Leadership Position *Atmanirbhar Bharat* Mission

Raj Sharma*

The firm foundation of Education is an absolute necessity for the five pillars of the Atma Nirbhar Bharat call given by the Prime Minister in his address to the Nation on May, 12 2020. Not only for self-reliance but for a Nation to be a leader, the role of education and academic institutions is critical and cannot be over emphasized.

I am fortunate to have had the opportunity first as a student and then as a faculty at various leading institutions in different parts of the world that helped shape my views. What follows is an attempt to ignite thought and debate in the above direction.

Global Leadership

How does a Nation become *a global leader/ power*? By becoming a *knowledge power-house*. How does a Nation become a knowledge power-house? With *intellectual capital*. How does a Nation generate intellectual capital? By investing in *education*, of course – but more importantly, *creating / providing an eco-system / environment that encourage free and critical thinking*. Education in all fields and at all levels – primary, secondary and tertiary. Education is followed by research and then development. Research is nothing but an attempt to seek new evidence or clarification to better understand existing phenomena that may or may not lead to new developments.

India was a global leader in the past because India was a knowledge power-house – Bharat's (India's) contributions to the world in science, mathematics, engineering, medicine, arts, music, languages, literature, culture (the entire spectrum) are legendary and that is what created wealth for us! Perhaps Einstein summed it up when he said, "Indians taught the world to count". Nalanda and Takshila, much, much before Oxford or Cambridge or Harvard or Stanford or Columbia or Princeton or MIT or CalTech or Mines or others like them, were setting the intellectual agenda and producing "Made in India" scholars from all over the world. As an example, Chinese scholar, Hieun Tsiang, came to India in search of knowledge and spent a few years at Nalanda about 1400 years ago and returned to China with hundreds of books / manuscripts to translate from Sanskrit to Chinese – his collections still continue to be preserved for scholars till today! Many other examples of India's global leadership can be cited. Unfortunately, over the past hundreds (thousands?) of years we lost our 'scientific temper'! Why and how? Hard to answer!

The United States of America today is a global power because of its economic and military might – and, this happened with intellectual capital from all over the world basically over the past 100 years. During the eighteenth and nineteenth centuries it was Britain, mainly, that dominated the world until the Second World War – again with intellectual capital particularly because of 'technology'. Germany's (Hitler's) attempt to rule the world, along with the Axis powers, were again based on intellectual capital in science/engineering / technology. This is certainly not to say that intellectual capital should be used for domination. Leadership is about showing the way for upliftment of humanity whereas domination is all about power and suppression. Starting in the early 1930s, Germany began losing their 'intellectual capital' because of its policies when German scientists began migrating mainly to the United States (Einstein being a prime example) with the flood gates really opening up following the War. Many migrated to the US and the then USSR, with both hitting the jackpots of intellectual capital. Just to cite another example, Werner von Braun, the father of the German V2 rocket (which Germany used over Britain towards the end of WW II) became the father of NASA's space program. Starting in the 1950s and 1960s, and continuing till today, students from all over the world, particularly India and China, began flocking to graduate programs in US Universities and making US their home – intellectual capital began growing and accumulating and creating wealth in and for the US.

Wealth is created with intellectual capital and not 'bought' with 'foreign direct investment' (FDI)! Wealth is not just about money, but about all aspects of life as mentioned earlier – arts, music, culture,

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literature, science, mathematics, engineering, technology, spiritualism; the entire spectrum.

Partners in Development – and, Propelling India to a Leadership Position

I sincerely believe that academic institutions have to be partners in development of a Nation – not just by providing 'skilled' man-power but more importantly creating knowledge and critical thinking. Quoting J. R. Cole (2010), Emeritus Professor, Columbia University, New York,:

> *"From discoveries that led to laser, the global positioning system, the MRI, radar, and even Viagra, to predicting weather patterns, American research universities are one of our most essential sources of economic growth and social welfare. They have been a model of innovation throughout the world, and they can be used to solve the complex economic, social, scientific, technological, security, and medical problems that we face".*[1]

In the not too long ago past, the concept of the study of the human body as a biological machine was developed at the University of Bologna. At the Sorbonne, the study of societies in an empirical manner was formulated. And, of course, Newtonian mechanics came out of Cambridge.

Our academic institutions, particularly technical institutions, have to be partners in development (in the modern day context) of India. Our education must be objectives based (as opposed to outcome based) – you (in the general sense) can provide equal opportunities but cannot guarantee equal outcomes. Bhaduri and Sharma (2019) have discussed these aspects in detail and suggested that "universities in India should align their degrees to international standards and have the freedom to prioritize local and national needs first"[2]

Our research and development efforts should be directed to serve India's needs. We, Indians, are going to provide Indian solutions to India's problems – American solutions to India's problems won't do! Our 'evolution' has been different. India must have its own model of development for uplifting lives. Perhaps several consortia of IITs, other leading institutes, CSIR labs could be formed and tasked to identify and address the needs / problems of the country in various areas such as sanitation, potable water, transportation, energy, petroleum, environment, biotechnology and others. The solutions provided should be in the Indian context with well-determined time-lines[3].

It was heartening when our Prime Minister announced the Atal Innovation Mission (AIM) on July 31, 2016, and discussed 'Made in India' / 'Wealth Creation' on Independence Day in 2019 (the Finance Minister also used these terms soon after that)[4]. Implementation of the Innovation Mission, in my view, is upside down – innovation is mostly bottoms-up and not top-down. Setting up of Atal Incubation Centers (AICs) is good but innovation requires fearlessness of failure – for this an eco-system has to be nurtured starting right from primary education in our schools. Innovation is not only limited to technology but also products, processes, manner of doing things! Professor Robert Solow, Nobel Prize in Economics (1987), Institute Professor of Economics Emeritus at the Massachusetts Institute of Technology, calculated that about 80% of growth in the United States output per worker was attributable to technical progress. Professor Solow explained what he meant by 'technological change as follows.

"I am using the phrase 'technical change' as a shorthand expression for any kind of shift in the production function. Thus slowdowns, speedups, improvements in the education of the labor force, and all sorts of things will appear as 'technical change'"[5].

What will make our Academic Institutions Great?

NIRF or QS ranking, and the like won't. Setting the intellectual agenda for others to follow will! The Harvards, Stanfords, Princetons, MITs, Columbias, Mines, Yales, are not what they are because of rankings but rankings are because of them. To quote Professor Rosovsky of Harvard: "I attach no real importance to rank order…These are only crude measures, no better than rough orders of magnitude…". There must be a renaissance- we must re-discover our knowledge in all aspects of life, research it to seek clarification and new evidence to understand it better, leading to creation of new knowledge. Tall order! We must not of course re-invent the wheel but adapt and add to existing knowledge. This will of course not happen overnight or in our life time and may take a few generations – but then what are a few generations in the life of a

nation?! We should learn from our past and look to the future – if we are proud of our history, we will be confident of our future.

Attracting outstanding faculty by being pro-active, giving them a free, fair and a creative environment, and allowing them to deliver, will; publish or perish rat race won't! Perhaps the following few thoughts should add to our understanding of what makes academic institutions that they become.

Professor Rainey Harper, Founding President, University of Chicago, said:

"To what definite thing can the college president point, and say -- this is my work? Does he not find his highest function in helping others do the things which he himself would like to do? ... It is his business to find ways and means by which others may be helped to do their work."

Academics is a passion and self-motivating. A top-down approach won't work.

"...the leadership group at IITK has been and remains convinced that the imposition of standard from outside an institution, or an institution solely directed from the top, cannot be expected to result in an institution of more than mediocre quality…".[6]

Professor Rosovsky, Harvard University on university administrators:

"They are facilitators -- servants of the faculty and students,... . Their task is to implement educational policy set by the faculty ... and to make student learning more efficient."

Professor P Kelkar, Founder Director of IIT-Kanpur

"...conditions should be created for the spirit of academic freedom to be sensed and experienced by every member of the faculty and every student. In fact, a lecturer should assume full responsibility for any academic assignment… As a result he should feel that he is a potential professor. Similarly, no student should feel any hesitation in approaching any person of authority, including the Director".

In closing, Universities and academic institutions are not an enterprise in the form of a 'business'. Sadly, many private Universities in India are being looked upon as business to run and manage. It is 'profits' that drive 'business' contrary to the mission of academic institutions. It is very complex and difficult to evaluate 'outcomes' for Universities in terms of teaching, mentoring, research and outreach. Hence, performance based remuneration and incentives for faculty followed by certain private universities is not advisable as it merely becomes a numbers game and takes away creative freedom.

Tailpiece

Let's be honest – exceptions apart, we are self-serving; perhaps, the faculty-advancement system' has to do with it too, and personal pelf and glory. It is time for transformational leadership rather than transactional, to become facilitators rather than managers, to provide a vision for our institutes to propel India again to its rightful role as a world leader, again.[7]

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Transformative Curriculum for a Holistic and Multidisciplinary Higher Education

Hema Raghavan*

I am an octogenarian, who after 40 years of active teaching along with 13 years of administrative experience felt impelled to contribute this article even if it is a trifle late to introduce 'Transformative Curriculum' now. Critics can justifiably dismiss it as locking the stable after the horse had bolted. Nevertheless, with my firm conviction 'better late than never' I have given my suggestions. I have done this with hindsight after CUET admissions and new courses based on National Education Policy--2020 have started.

What is meant by the word 'Transformative'? According to the *Britannica Dictionary*, it means 'causing or able to cause a change, especially causing someone's life to be different or better in some important way.' In short, it inspires change or causes a shift in viewpoint. *Wiktionary* gives the example of a change in one's views on poverty and politics after he meets and talks to a homeless person as illustrative of a transformative experience. The issue of Transformative Curriculum implies something is missing in the state of higher education in India and needs attention. There is a felt reason for change – and a change goes without saying, is always for the better.

The transformation in Higher Education as envisaged by successive NEPs is changing University's role from idea generation to changing the idea of university.

The question as to whether we need transformatory shift is not binary swinging between a categorical yes and no, but the answer is a mix of both with the positive affirmation factoring in the contemporary needs of society and the negative assertion, rooted in the fundamental and traditional idea of a university. It is not again a question of tradition versus modernity but approximates closely to the function of history which simply defined, is Past Forward where the positives of the past are renewed, and the negatives discarded.

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To start with, let us explore why we need a shift in our views on higher education. Or on a slightly altered note, let us ask whether higher education has to shift to provide a new experience for the learners. What was wrong with the earlier experience that now seeks a new template? Is there a distinct change in the ability, expectation and concern of the present day learners that demands a shift in the curriculum of higher education?

What was the earlier experience like? As a student I belonged to the 1960 generation when university education was a heady experience. It was intellectually stimulating and invigorating as we traversed through a new world of thoughts and ideas on entering the university. It was definitely a step forward from school where we were tied to the classroom from nine to four, over 8 periods with a 20-minute lunch break. The college life was refreshingly different as we had no more than three lectures per day. The rest of the day was free for us to go to the library to collect notes and work on assignments on topics related to the lectures. A reading List was given by the Professors. It was initially a frightening experience as we floundered our way through the shelves to pick up the right books and gather material, but after the first couple of weeks it was a refreshing and rewarding experience as we developed interest and joy in reading books of varying arguments and learnt to analyze and critique them and articulate our views even if our articulation was deficient due our limited vocabulary. What began on a gingerly pace soon gained acceleration, partly to meet the deadline to submit the given assignments, partly through experiencing the joy of self- learning. This was in the 1960s when University education from the nascent college level to Masters and doctoral programmes at the University was a continuation of the traditional function of education and research to develop the general powers of the mind as well as to give specialized training in the chosen fields.

Thus, the role of the University was to meet the learning needs and aspirations of young students post school, taking into consideration their mental

abilities and aptitudes. There is no disputing the fact that University was considered an intellectual laboratory to generate new ideas for the benefit of society. There was a great emphasis on bringing qualitative change in the lives of the people. Not only was the focus on Science and Technology, Medicine, and Pharmaceuticals, but also in the social sciences to solve the problems generic to people and society. Both Sciences and Social Sciences were linked to ensure the vibrancy and well-being of people.

The admissions were restricted to those who had a genuine passion for research and academic pursuits. Hence, university slowly became the preserve of a small minority of educated elites who enjoyed intellectual independence to pursue their research. University cocooned itself as a close-knit group with its own self-directed autonomy and ethical independence. Richard Arneson, the American Philosopher writing on political elitism went so far to claim that those with greater relevant knowledge had a right to a greater share of political rule to make correct public policy. Thus, intellectual elitism was justified to bring about justice and promote equality in society. But the egalitarian ideals of Democracy of liberty, equality and Justice did not favour the rule of a small elitist group. John Dewey, an American educationist and philosopher suggested education policies should aim at providing equal opportunities and imparting knowledge and awareness to 'all citizens'. He argued that American democracy should be reconstructed so that government would be 'by the people' not just 'for the people'. But the rule of democracy slowly turned into 'the Tyranny of Majority' which came under critical review by leading sociologists and intellectuals like Alex Tocqueville, John Stuart Mill, and John Rawls to name a few. In his book on the *Theory of Justice* Rawls counterclaimed that elitism was not wrong if it could work for the betterment of the disadvantaged majority.

Unfortunately, the term 'elite' has taken on a pejorative connotation today as it goes counter to democratic egalitarianism. The exclusivity that had earlier given universities the status of the privileged class is now seen to be at odds with democratic ideals that encourage opening the university to a large number of young men and women after they clear the XIIth Boards. Statistical data show admissions in the '60s were 5.4 million; in the '70s, it was 7.4 million and today it is 16 million. University expansion has almost doubled. The university can no longer remain cocooned and isolated from society, its aspirations, and its problems. It must be inclusive and accommodate everyone who wants higher education irrespective of his/her intellectual potential and passion for learning. The fact of the matter is if these 16 million don't go to college or to post-higher secondary institutions, what will they do? The colleges and the universities to which they are affiliated along with other post-higher secondary institutions such as Polytechnics, ITI s have come forward to take responsibility for this humongous number of young men and women and harness their youthful energy and expectations in the right direction. This has necessitated making changes in the university curriculum to cater to students of diverse mental abilities.

But we cannot ignore the truth that quality and quantity are inversely proportional variables, and it is more so in the field of education. With the increase in the number, the quality of teaching and learning has changed in the last two to three decades and university standards have begun to decline. When I started teaching at the University of Delhi in the late '60s, the tutorial classes had 6-8 students when I could pay individual attention to their work. The class strength was around 30. Today, the University of Delhi has increased class strength to 60+, (though the actual number in many colleges in Delhi University is more than that) and for tutorials, it is 30 and for practicals, 15-20. Research has taken a back seat as teaching many students has become the priority, taking precedence over all other activities. Teachers are given a punishing load of teaching, evaluating, mentoring, and attending to all allied activities of the college. College teaching has become like school teaching with a 9-4 schedule, leaving no time for research for the teacher and self-study for the taught (Delhi University has recently notified the possibility of stretching the working hours from 8 am to 8 pm). The pressure on the government to manage the massive numbers has been passed onto the Universities who, in turn, ask colleges to absorb them, unmindful of the lack of infrastructure and adequate faculty. Classrooms that can accommodate 40 (stretched to fifty at the outermost) have now to squeeze more than double the number of students. The teacher's voice is hardly audible nor is s/he visible to the entire class as the students spill over to the corridors outside the classroom. Many students stand as there are not enough chairs. What policies should

be pursued to preserve democratic access to higher education without compromising on quality and to match individual talent to intellectual opportunity? How do preserve universities in their traditional role of ideation which is to develop new ideas and concepts and creatively communicate them? How to make degrees reflect the students' true worth and not serve as worthless documents when they are in search of jobs?

NEP--2020, as on the previous occasions in 1968 and 1986 has attempted to provide easy access to all students desirous of university education. The establishment of Open University-IGNOU by the government in 1986 was a commendable solution to provide access to university education to all aspiring students and working men and women of all ages who wanted to do graduation. The strength of students in IGNOU stands at 4.3 million today. These students are not students in pursuit of research but are lifelong learners who are keen to academically upgrade themselves and earn a degree.

But for the rest of the 12+ million, there is an urgent need for tertiary education that could help them to be trained and educated to qualify for a job. Vocational Institutions like ITIs (Industrial Training Institutes), ITCs(Industrial Training Centres) and Vocational colleges affiliated with established universities that were earlier started have not been successful as there is a huge disconnect between training imparted in these institutions and the requirement of the industry. The faculty in these institutions are not adequately trained in imparting skills to their students, leave aside their lack of adequate knowledge about the industry's requirements. The students ---both in the vocational and the nonvocational streams---have graduated with no academic proficiency or professional orientation or any skill that could fetch them a job.

Despite the failure of vocational courses both at the degree and diploma levels, the NEP---2020 envisages that by 2025, at least 50% of learners have vocational exposure through school and higher education and that there shall be 'no hard separation' between the vocational and academic streams. Though it is a welcome statement, the fact is mixing of the two streams has been detrimental to higher education. Academic knowledge is about concepts and theories and gives basic instruction to the students. Skill training is the application of that knowledge in industry and business. The mixing of the two is like mixing grapes and strawberries where one is acidic and the other alkaline. Both individually have their value but together they harm the digestive system. The three years undergraduate programmes, now raised to 4 years has its objective, of enhancing higher-order skills in problem-solving, leadership, analysis, and decision-making among students. This is achievable only with a few students who have intrinsic love and passion for academic study. It is wrong to presume that all the 16 million students passing out of school have the potential and a liking for academic studies. More than 90% of them will feel bored sitting through long university lectures after 12 years of study in schools. Similarly, the other 10% may not have the potential to learn vocational skills. The one size- fits all policy is one of the reasons for the decline in higher education. Further, pushing everyone into colleges has resulted in the devaluation of degrees.

Transformative education must first address what does a university stand for? Don't we need new ideas, concepts, and theories that can interrogate the problems of our times and work towards plausible solutions? The earlier system of education has been noteworthy giving rise to brilliant scientists and technocrats such as Homi Bhabha, Srinivasan Ramanujan, C V Raman, Vikram Sarabhai, Jayant Narlikar, A P J Abdul Kalam, Hargobind Khurana, J C Bose, Birbal Sahni, Subrahmanyan Chandrasekhar, while the Humanities and Social Sciences had seen distinguished scholars like Amartya Sen, Abhijit Banerjee, Partho Chatterjee, Gayatri Spivak Chakrabarti, Prof M.N. Srinivas, Prof Andre Beteille just to name a few. This is proof that Universities when given the autonomy and exclusive focus on research and funding, produce giant scholars who generate ideas for solving problems of society. Let us enumerate the possible steps to rejuvenate higher education.

1. *The first step to bringing back quality in higher education is to keep vocational training and skill training distinct from academic studies and research. Universities should focus only on academics and research.*

2. *A*dmission *to colleges must be through entrance examinations which should have the essay pattern and not the present multiple-choice.* Those desirous of academic studies can prove their ability to in-

depth study, analysis, logical interpretation, and good language skills to express their ideas and thoughts.

3. *Universities have a great responsibility to preserve, sustain and nourish intellectualism*. This cannot be done if we apply the principle of egalitarianism to allow all students of the XIIth Board to enter colleges and universities.

4. *To cater to the vast number of students left out of universities, it is vital to establish new Open Universities and MOOC programmes, Vocational Institutions*. Online interactive programmes are to be conducted to give *the students a feel of* classroom education. Degree examinations are to be conducted by Open Universities twice a year *on the pattern of IGNOU.* The advantages of an Open University are flexibility both in pursuing the course and in choosing subjects of one's choice. The MOOC programmes of high quality are of great advantage.

   Courses are offered for free a) Access to courses offered by professors at the top schools b) Courses are available to a vast and diverse audience across the globe c) Learners' performance can be monitored easily using the data captured during the start of courses d) Both professors and learners get worldwide exposure, thus improving pedagogical techniques and knowledge sharing, e). Can be used as a tool in a blended learning program, where students can access more information than what is provided in the class. (www.infoprolearning.com)

5. *The curriculum revision at the end of every three years is important as knowledge is developing at lightning speed and what is new today becomes obsolete tomorrow. The curriculum revision must be done only by University Professors of repute and experience and should not be dictated by the industry.* Research creates the foundation for major advances in such areas as health and medicine, communications, food, economics, energy, and national security. And it helps educate students to be scientific leaders and innovators.

6. *University should continue to function as the platform for enlightened scholars, researchers, and responsible and constructively critical citizens to interact and develop highly qualified human resources.* `The quality of human resources is indexed by the quality of higher education. Interdisciplinary research must be given greater importance than standalone discipline research. The IITs have for the last two decades introduced humanities as mandatory courses. This must be replicated in a more systematic way in the graduate courses in Liberal Arts and Science colleges. A good example is the study of environmental science by Fritjof Capra in his three books-a) *The Tao of Physics: An Exploration of the Parallels Between Modern Physics and Eastern Mysticism, b)The Turning Point and c) The Web of Life*. All three speak about the fundamental interrelatedness and interdependence of all phenomena and the intrinsically dynamic nature of reality. Capra told Heisenberg the Quantum Physicist how Eastern mysticism and contemporary scientific findings relate, and how Eastern mysticism might also have the linguistic and philosophical tools required to work on some of the biggest scientific challenges still remaining unsolved. Heisenberg learned Indian philosophy from his conversations with Tagore while the other celebrated Physicist Niels Bohr during his visit to China understood that new theories in Physics are not all that new, as they could be found in the Eastern culture. Students must be exposed to the multidisciplinary approach to recognize the web of education.

7. *Raise the quality of instruction and standards for institutions other than universities/ colleges to eliminate alleged hierarchies and silos between different areas of learning*. The perception is wrong with reference to hierarchies that University graduates are superior to students graduating from Vocational Institutions. A boxer is a boxer and excels in his field. A wrestler is a wrestler. If they both get Olympic medals, can we say one is hierarchically higher? Same with Vocational and academic/professional streams---each one chooses according to his talent and each one achieves according to his potential and work.

8. Emphasis on conceptual understanding rather than rote learning and learning-for-exams is central to any form of education. Creativity and critical thinking must be encouraged to enhance logical decision-making and innovation. This should be the focus of Academic studies. It

must enable an individual to study one or more specialized areas of interest at a deep level, and develop character, intellectual curiosity, scientific temper, creativity, and spirit of service, across a range of disciplines including sciences, social sciences, arts, humanities, languages, etc. This can be done by changing the timetable which is presently lopsided with a heavy dose of lectures and tutorials for a minimum of six hours-if, not more, with no time for self-study, additional reading that helps in analysis, interpretation, and assimilation of the topics covered. The system needs a wholesale reform where lectures should not be more than two per day and Tutorial attendance to be mandatory and should also not exceed two per/day. The timetable should be for half a day to give sufficient time for the students to self-study and for other extracurricular activities. Lectures should be short and serve as a catalyst to whip up interest in the students. Faculty should be trained to give capsule lectures, short, and compact that whet the listener's desire to learn more. One of the brilliant Tamil epigrams says --- for the entire pot, it is enough to test the single rice for the desired level of cooking. Similarly, a single lecture should be adequate to summarise a topic.

9. Vocational studies are skill-based and promote skill-based innovation. It has its sphere of intellectual and practical areas for innovation. The theoretical classes should be held on alternate days, leaving the other three days for training in the industry. Industry must come forward to train them and ensure jobs to the students on completion of their courses. *The skill training in vocational institutions should pay greater attention to professional, technical, and vocational subjects.* By mixing both streams, --- the academic and the vocational-neither academic excellence nor skill enhancement can be achieved. *The need to separate the two streams is of paramount importance.* The present mixing of courses in the colleges has reduced the academic time to accommodate skill-based courses.

10. Ethics and human values like empathy, respect for others, cleanliness, courtesy, democratic spirit, the spirit of service, respect for public property, scientific temper, liberty, responsibility, pluralism, equality, and justice; and life skills such as communication, cooperation, teamwork, must be given as extra-mural courses to enable interested students to sign for the courses. The concept of Cluster colleges is a good concept where different colleges take up 3-4 courses and open them up both for their own students as well as from other colleges.

    These courses must be add-on courses without mandatory attendance and should not infringe on academic time. They must be a part of the optional curriculum both in university colleges and vocational institutions. The best way to do this is to organize a concentrated Lecture Schedule twice a week in the afternoons, open to all including the faculty by eminent academicians, professors, writers, etc. with the title Science-not for Scientists alone, Humanities not for students of Humanities alone, etc. The purpose of the course title is to provide multiple audiences with a snapshot of different disciplines and what they are about. Those audiences include current and prospective students, prospective employers, accrediting bodies, other academic institutions, and various other audiences inside and outside of the University. These lectures can have a wide range of topics and subjects such as Illustrated lectures on Art, History (India, Europe, and Asia), New dimensions in Physics /Chemistry, and Nano Sciences, World History, Introduction to Painting, History of Music, Theatre and Cinema, Liberal Arts investigating literature, past, culture, and human values, Readings from Great Books, etc. Fees are to be charged only to the public (and not to students and faculty). Grant-in-aid from Government besides contributions from alumni and Corporates can meet the honorarium to the distinguished speakers.

11. The curriculum and pedagogy of our institutions must develop a deep sense of respect towards the Fundamental duties and Constitutional rights bonding with one's country, and a conscious awareness of the world to understand one's roles and responsibilities as a citizen of the Globe in changing geopolitical order. The aim is to instill a deep-rooted pride in being not just Indian but a human, in thought, spirit, intellect, and deeds. Our education system must be rooted in fostering humaneness, fellow feeling, peace, and tolerance commitment to human rights, sustainable development and living, and global well-being reflecting a truly global citizen.

12. Induction of Professors of Practice to be shelved. If not for anything at least for the no-confidence it shows to the academic community. It is a downright insult to academic scholars who are in the main Ph. Ds and post-doctoral scholars. Professors of Practice have enormous industry experience. It has also failed to factor in the unique relevance of University and Industry

    1. Universities create Knowledge.

    2. Industries use and apply knowledge for their products.

    To ask Industry heads and similar leaders in applied fields to join universities as Professors of Practice is conflating two separate streams as though they are miscible. A simple analogy is that of an architect and an engineer and allied construction workers. The engineer executes the architect's plan for he can do nothing without the plan. With masons, electricians, plumbers, and all involved in the construction. Similarly, universities generate ideas-ideas that are translated into practical solutions for the people by industry, business, and all executors in the non-academic groups. If the ideas are not there what is there to execute?

13. The present insistence on Skill Enhancement courses alongside academic studies should be dropped. Among the plethora of courses listed by the UGC, we have Beauty and Wellness, Jewellry design, Fashion Modelling, Beauty Pageant Grooming, Interior and Architecture Designing, Tailoring, Event Management, Fine Arts & Digital Arts, Bee-Keeping, etc. Where is the faculty who are trained to impart these? Are they academic courses or those of Polytechnics? It is time Universities don't lose sight of their role and focus only on skills in tandem with the academic courses. Instead of making a farce of these courses and turning out students with barely minimum skill, Universities should tie up with Industries, Business organizations Markets, Computer firms, etc., and give two days a week for training in the skills the students choose. The present six-day surfeit of lectures can be trimmed to four weeks of two-three lectures per day.

I conclude with the Afterword: Money never starts an idea. It is the idea that starts the Money. Universities engender an idea. The entrepreneurs convert the Ideas into Money. You need skills, but different strokes for different streams.. ❑

Componential Flexible Curriculum for Implementing National Education Policy—2020: A Stage Specific Subjective Approach

Dibyendu Bhattacharyya*

The Indian education system has been upgraded with a challenge of quality blended with a pragmatic vision. In ancient Indian education, the system was rooted in terms of knowledge aspects. Multifaceted knowledge was produced in exercising teaching and learning, either under the leadership of teachers or later on, under the leadership of an institutional set-up. However, after independence Indian education system, though much has been achieved, lacks the isolation of an epistemological perspective. We have had tremendous information in the last few decades, regardless of the subject we consider, and we are not sure that information can produce a knowledge base of a content domain.

From the Philosophical Perspective, a curriculum can be divided into different dimensions as per Indian Perspective (Table-1).

So, structuring knowledge is one of the most important aspects of the philosophy of education. It helps to develop a logical sequence of any subject matter. Based on a philosophical perspective, we can divide the knowledge domain into the following categories:

Thus, practicing the philosophy of education entails focusing on knowledge reflected in the curriculum, which is the fundamental viewpoint in teaching and learning. In the present globalized scenario, we have no other alternative but to follow the construction and reconstruction of knowledge for society and individuals too.

Curriculum and Educational Purposes

Curriculum from philosophical perspectives helps to provide a critical outlook towards the foundation of the curriculum. Whether stated explicitly, or implicitly, the purposes of education constitute the reference points for determining the content and organization of the curriculum. National Education Policy–2020 stated unequivocally its intention to follow Indian rich cultural heritage to upgrade its education system and its application in the truest sense to materialize the Curriculum in the best possible way in the Indian context:"The rich heritage of ancient and eternal Indian knowledge and thought has been a guiding light for this Policy. The pursuit of knowledge (*Jnan*), wisdom (*Pragyaa*), and truth (*Satya*) was always considered in Indian thought and philosophy as the highest human goal.''

The Policy has had the effort to explore the purposes of education in ancient India not just by means of acquisition of knowledge but for the complete realization and liberation of the humanity.

Philosophical Perspectives: Aims and Vision

The aims of education in any society are influenced by various factors like the following:

1. Cultural heritage and traditions of the society,
2. Social structure,
3. Economic and political systems; and
4. Environmental and Philosophical Perspectives.

Philosophical considerations that give educational aims in any society can contribute towards a general agreement leading to a vision of any curriculum framework. Issues like the development of scientific attitude and commitment to moral and spiritual values, secularism, democracy, and equality of educational opportunity require a thorough examination in order to determine their precise implications for concrete curricular vision in terms of the knowledge base of curriculums indicated in the NEP–2020: "Indian culture and philosophy have had a strong influence on the world. These rich legacies to world heritage must not only be nurtured and preserved for posterity but also researched, enhanced, and put to new uses through our education system."

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Table-1 : Types of Curricula: An Indian Perspective

Types of Curricula	Developed by	Educational Component	What Should be
Aesthetic Curriculum	Rabindranath Tagore (1861-1941)	Aesthetic Component	Inclusion of performing arts and cultural perspectives in the curriculum.
Basic Curriculum	Mahatma Gandhi (1869-1948)	Experiential Components	Curriculum based on activity and self-supportive mechanism.
Integrated Curriculum	Rishi Aurobindo (1872-1950)	Integration of Idealistic, Naturalistic, Pragmatic and realistic curriculum.	Integration of Eastern and western philosophical motives.
Ethical Curriculum	Swami Vivekananda (1863-!902)	Components based on ethical and spiritual dimensions.	Curriculum based on morality.

Table-2: Categories of Knowledge Domain

Types	Knowledge Domain	Subject Area
1	Disciplinary Knowledge	It means theoretical understanding along with its application.
2	Behavioural Knowledge	Change of cognitive and non-cognitive domain.
3	Practical Knowledge	Knowledge based on practical activity.
4	Social Knowledge	Society is the source of Knowledge.
5	Productive Knowledge	Creative Knowledge
6	Aesthetic Knowledge	Performing Arts and other related activities.
7	Experiential Knowledge	Knowledge based on activity and experience.

Table-3: Stage-wise Differentiation of Curricula

Stage-wise approach	Stage-wise developmental component	Curricular Approach	Pedagogical Approach
Foundational Stage Age :(3+ to 6) & (7 and 8) nursury, KG1 ,KG2, Class1 and class2	a. Caring education b. Physical Preparation c.Developmentof Senses	Curriculum based on Play way activity and different non cognitive involvement based on interest of learners.	Play way activity with caring education.
Preparatory Stage 9 to 11 class 3, class 4 and class 5	a. Habit formation b. Attitude formation c. Nature study	Education must be based on hand on experiences.	Curriculum based on Self activity and self-supportive mechanism.
Middle Stage class 6, class 7 and class 8.	a. Field Study b. Experiments c. Activities	Group activity based on particular content areas. Practical based learning to be enhanced.	Group discussion Teaching based on practical classroom related activity.
Secondary level Class IX ,X & XI &XII	a.Theoretical background b.Practicalbased classroom c.Project activity	Knowledge base of any content to be developed both the theoretical perspective and practical understanding.	Innovative pedagogy i.e. pedagogy based on concerned teacher and no specific recommendations.

Implementation of Curriculum

It is appreciable that the total school curriculum has been divided specifically into four stages in NEP–2020 to execute the school curriculum in a qualitative way. But it is not very easy to identify their developmental parameters and suggest curriculum structure accordingly. One thing that is good is that the proposed curriculum has a global approach to make it a worldwide standard, and the proposed draught curriculum should have a balance between our needs and demand with global aspirations.

The proposed curricula and pedagogical approach on the basis of a 4-stage design in a distinctive way is given in Table –3, as suggested by the National Education Policy 2020, India. Stage-wise specific curriculum recommendations are given in Table-4.

A Model-based on Componential Flexible Curriculum is Suggested to Carry-out the Programme in Table 4.

First Step: Identifying Knowledge-base of the Curriculum

Knowledge Domain
Disciplinary Knowledge
Behavioural Knowledge
Practical Knowledge
Social Knowledge
Productive Knowledge
Aesthetic Knowledge
Experiential Knowledge

Second Step: Identifying Components Relevant to the Curriculum

The present paper deals with the following components:

Aesthetic Curriculum
Basic Curriculum
Integrated Curriculum
Ethical Curriculum

Table-4: Stage-wise Specific Curriculum Recommendations

Stage-wise approach	Stage-wise Curriculum component	Recommendation of Specific Curriculum
Foundational Stage	a. Caring education b. Physical Preparation c. Sense Training	1. Curriculum will be flexible 2. Curriculum based on 3R.
Preparatory Stage	a. Attitude formation b. Habit formation c. Nature study	1. Curriculum based on hand on experiences. 2. Curriculum based on activity and self-supportive mechanism.
Middle Stage	a. Field Study b. Experiments c. Activities	a. General orientation of Core academic Subjects. b. Development of independent personality through curriculum and pedagogy.
Secondary level	a. Theoretical background b. Practicalbased activity c. classroom based Project activity	a. Knowledge base of any content to be developed both the theoretical perspective and practical understanding. b. Core subjects are gradually introduced and enhanced. c. Curriculum may be divided in the following category: 1. Core subjects based on Science, Arts, Commerce to be selected as per interest from learners. 2. Elective courses for Multidisciplinary approach. 3. Language group as per language policy. 4. Aesthetics: Any one performing Art to be selected.

Third Step: Identifying the Dependent area

Subject Area
It means theoretical understanding along with its application.
Change of cognitive and non-cognitive domain.
Knowledge based on practical activity.
Society is the source of Knowledge.
Creative Knowledge
Performing Arts
Knowledge based on activity and experience.

Fourth Stage: Stage-wise Curricular Approach

Curricular Approach
Curriculum based on Play way activity and different non cognitive involvement based on interest of learners.
Education must be based on hand on experiences.
Group activity based on particular content areas. Practical based learning to be enhanced.
Knowledge base of any content to be developed both the theoretical perspective and practical understanding.

Fifth Stage:Pedagogical Approach

Pedagogical Approach
Play way activity with caring education.
Curriculum based on Self activity and self-supportive mechanism.
Group discussion Teaching based on practical classroom related activity.
Innovative pedagogy i.e. pedagogy based on concerned teacher and no specific recommendations.

Sixth Stage: Draft Curriculum: To be prepared stage specific draft curriculum in flexible mode and output based approach.

Seventh Stage: Validation of Curriculum: It will be validated by means of several parallel qualitative approaches:

i. Experts' viewpoint.
ii. Collaborative approach
iii. Stakeholders attitudes

Eighth Stage: Final Shape: All the components must be combined together after validation to make it into a final shape.

Therefore, a componential flexible curriculum is opposed to both the systematic approach of curriculum as well as a curriculum as a process. It is willing to accelerate the subjective approach of the curriculum based on curriculum components as fit for the stage-specific curriculum.

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Holistic Higher Education through Multidisciplinary Transformative Curriculum: Roadmap for Implementing National Education Policy–2020

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"Holistic education is not to be defined as a particular method or technique; it must be seen as a paradigm, a set of basic assumptions and principles that can be applied in diverse ways."

– Ron Miller (1992)

Higher Education (HE) lies at the top of the educational pyramid along with the other levels of education such as primary, secondary, and senior secondary occupying the base of the pyramid. HE is a broad term that describes a wide range of academic and professional programs and offers a variety of undergraduate and graduate degrees. It is typically associated with institutions of higher learning such as universities, colleges, and seminaries. The development of higher educational institutions in India is rapid in the recent past due to globalization and swift development in science & technology. However, in the 21st century; the era of transformation, change is occurring in society at a rapid speed where the ultimate goal is to improve outcomes through an alteration of practices. The above saying can truly be applied to the modern education system especially in higher education. In today's digital and technology world, the older higher education system with its teacher-centered approach, passive learning, time-based, textbook-driven, fragmented curriculum, and low expectations from the learner does not seem to cater to the learning needs of 21stcentury students. Now, Learning is more collaborative and in partnership with the teachers and the students than the traditional way with the teacher as the primary decision-maker for the students. The COVID-19 pandemic served as a catalyst for transformation in higher education by forcing colleges, universities, instructors, and students to shift online rapidly. To cope with the changes, higher education in India must reform itself. This can only be possible through Holistic development in higher education. In a holistic development context, a big transformation in terms of structural, institutional, transactional, and evaluation reforms in India was needed (Walia & Manju, 2018, p.102). New reforms in the education system help to maintain creativity, adaptability, and quality of education. Curriculum plays an important role in achieving holistic higher education. By transforming the curriculum, the goal of holistic higher education can be achieved through a multidisciplinary approach. Recent documents like NEP-2020 also emphasize the importance of holistic and multidisciplinary higher education by providing a roadmap to achieve it. So, before discussing multidisciplinary transformative curriculum let's discuss holistic higher education and its goals.

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Holistic Higher Education

According to Miller (2004) Holistic education, a new movement began in the mid-1980s to take form as a recognizable field of educational study and practice in North America (as cited in Mahmoudi, Jafari, Nasrabadi & Liaghatdar, 2002, p. 178). It encompassed a wide range of philosophical orientations and pedagogical practices and focused on wholeness to avoid excluding any significant aspects of the human experience (Jafari, Nasrabadi & Liaghatdar, 2002, p. 178). According to Miller (2006), "Holistic education focused on the relationship between the whole and the part and suggested that teaching and learning approaches need to be rooted in a larger vision. If techniques are isolated and unrelated, traditional education tends to be static and fragmented, ultimately promoting alienation and suffering."

Holistic education may be conceived as a comprehensive approach to teaching where educators seek to address the emotional, social, ethical, and academic needs of students in an integrated learning format. Here the emphasis is placed on positive school environments and providing whole-child support (services that support academic and non-academic needs, also known as wraparound

supports) to students. Students are taught to reflect on their actions and how they impact the global and local community, as well as how to learn from the community around them. Teachers often engage students in projects that apply critical-thinking skills toward solving real-world problems.

Goals of Holistic Education

- Cultivate and develop individuals' physical, emotional, moral, psychological, and spiritual attributes.
- Provide opportunities that are personalized to individuals' skills and feelings.
- Allows students to utilize their individual strengths in a safe, supportive environment.
- Prepare teachers to nurture students with varying educational levels and learning capabilities. Encourage teachers to employ a variety of methods and strategies to create a holistic learning culture.

Model of Holistic Education

Kulkarni (2021) has given a model about Holistic Education which has 10 building blocks. These are discussed in under given Table-1:

This model of Holistic Education has the strength to empower the students to develop multi-stakeholder sensitivity by providing opportunities to interact with the stakeholders of various organizations as part of their course curriculum. It also seeks to encompass and integrate the purpose of developing good human beings capable of rational thought and action, possessing compassion and empathy, courage and resilience, scientific temper and creative imagination.

The COVID-19 pandemic outbreak has resulted in a paradigm shift in the education sector across the world leading to various challenges open to be addressed. According to Kulkarni (2021): "Higher Education Institutes must have a multi-

Table-1: Building Blocks of Holistic Education and their Features (Kulkarni,2021)

Building Blocks	Features
Purpose Driven	Prioritises intrinsic motivation and helps students to become more engaged in learning experiences through connecting their beliefs and life goals to curricular requirements.
Full Brain Engagement	Focus on full brain engagement which blossoms their consciousness. This consciousness indeed is the seed of creativity, intuition, and innovation.
Full Sensory Engagement	The auditory, visual, and kinaesthetic abilities of the students should be utilized fully for learning.
Multi-mode Learning	Through blended learning, combining classroom teaching with technology enables more dynamic and rich learning experiences.
Focus on Capability	Provide a platform for the development of conceptual knowledge and skills among students to enhance their capability.
Full Focus Learning	Evolve the teaching pedagogy to make education more experiential, integrated, inquiry-driven, discovery-oriented, industry-focused, discussion-based, flexible, and enjoyable.
Balanced Learning	Create an ecosystem to develop resilience among the students which enables them to learn the ability to balance their mind, emotions, and feelings. This can be achieved by introducing the students to Yoga, Pranayama, Sudarshan Kriya, and Meditation.
Continuous Learning	Develop a lifelong learning program that facilitates the requirements of the multi-career possibility.
Ancient Vs Modern Learning	Ensures a healthy blend of both: eastern philosophy and tradition with the cutting edge, western (scientific) temperament.
Full Being Learning	Focus not just on the learner but also her/his family members, colleagues, society, and community as well. This will nourish the different subtle levels of existence of the human being, building a full nourished confidence and a strong stable personality.

pronged approach towards creating an ecosystem of nourishing intellectual, emotional and spiritual quotients in students so that both the discovery of 'self' from within and its dynamic expression outside, are facilitated. Building an integrative and holistic model of education rests upon the understanding of the core essence of education, which inculcates wisdom and humanity in the hearts and minds of learners," (pp. 7-8).

Therefore, all aspects of curriculum and pedagogy need to be revamped and reoriented to create a holistic higher education system (HHES). The above-discussed 10 building blocks of Holistic Education have thrived to fulfill the aim of education through the discovery of self and professional Excellence which are considered to be the main pillars of the Higher Education System. Higher education gives the future to the nation. So, there is a need to build a strong higher education system to prepare a strong nation.

Key Indicators of Holistic Higher Education

The model of Holistic Education rests upon four key indicators, namely purpose, teaching pedagogy, learning process, and outcomes (Kulkarni, 2021, p. 11). The fulfillment of each indicator will be helpful for a Higher education Institutes to create an ecosystem of Holistic Education for its students. These indicators are discussed in table-2:

Table-2: Key Indicators of Holistic Higher Education

Indicators	Properties
Purpose	• Pursue Knowledge • Integrate wisdom • Connecting life goals and curriculum
Teaching Pedagogy	• Full-brain engagement • Sensory engagement • Mode of teaching
Learning Process	• Experiential learning • Life-long learning • Full focus learning
Outcomes	• Capability & Skill • Best of East & West • Full blossoming of personality • Employability/Enterprise

Hence, such a model of Holistic Education seeks to imbibe the highest standard of multi-disciplinary teaching and research in Higher Education. It enables the students to have multi choice possibilities in terms of selecting the courses of study as well as instill a variety of skills in them to get well-versed in multiple careers.

Multidisciplinary Transformative Curriculum: Path to Achieve Holistic Higher Education (HHE)

The word "curriculum" comes from the Latin word '*currere'* which etymologically means 'racecourse'. In the field of education, students try to reach the desired goal of education according to their needs and abilities with the help of curriculum (Mondal & Das, 2021, p. 260). Curriculum refers to all the experiences that students gain through classrooms, workshops, playgrounds, and interactions with teachers. However, in order to cope with the needs of the 21st century and make existing education more advanced and appropriate, curriculum needs to be changed. A good understanding of change and clear conception of the curriculum are necessary conditions for improved implementation of new curriculum into practice. Furthermore, as the conception of learning is becoming more studied and considered as an important factor changing education, exploring and rethinking what learning is deserves more attention in the future curriculum development efforts. As technology proliferates throughout higher education, curriculum is likely to become even more transformative and robust in both the online and face-to-face classrooms. Also, in order to achieve the Sustainable Development Goals (SDGs) target-4; Education for Sustainable Development (ESD) role of transformative education becomes crucial. That is why Arbeiter and Bučar (2020) suggested that, "When education is transformative, it can enable structural shifts in basic assumptions, thoughts, feelings, and actions, and equip learners with the knowledge, skills and attitudes to promote sustainable development. Transformative education enables learners with understanding and anticipation of change, managing uncertainty, critical thinking, value changes, appreciation of diversity, and empathy," (p. 4).

Hence to achieve transformation in education for sustainable development we should first transform

our curriculum to foster and enhance the 21st century skills like creative thinking, problem-solving, research and creativity. Therefore, the curriculum for the 21st century must be holistic, transformational, encompassing learning content, and outcome-based so that it enhances the cognitive, social, emotional, and behavioral dimensions of the learner. Johnson (2009) suggested a transformative curriculum must (i) be linked and connected to the life of the learner, (ii) be challenging, yet attainable, and (iii) inspire students and teachers (as cited in Hallupa, 2016, p. 17). So, while designing the curriculum for higher education, it must include those subjects that empower learners with knowledge, skills, values, and attitudes to take informed decisions and make responsible actions for society.

India has a rich tradition of the multidisciplinary approach since ages, as exemplified by ancient institutions such as Nalanda, Takshashila, Vallabhi and Vikramshila. These higher learning centers of ancient India were known for teaching every branch of knowledge, such as singing, painting, chemistry, and mathematics; vocational fields such as carpentry, and clothes-making; professional fields such as medicine and engineering; and soft skills such as communication, discussion, and debate. Over the centuries the broader learning opportunities got narrowed and gradually in recent years the focus moved to specialization in particular subjects resulting in the growth of single-stream institutions. A multidisciplinary institution should not only have different departments, but also should have innovative programmes of a multi- and interdisciplinary nature to help widen learners' thinking and learning capability and train them to address emerging challenges.

According to United Nations Educational, Scientific and Cultural Organization (UNESCO)-International Bureau of Education (IBE) report-2013, "Multidisciplinary curriculum is one in which the same topic is studied from the viewpoint of more than one discipline. Through a multidisciplinary approach we can integrate the curriculum which focuses primarily on the different disciplines and the diverse perspectives to illustrate a topic, theme, or issue."

Therefore, a multidisciplinary approach is recognized as one that leads to holistic development as it brings about not only the development of knowledge but also skills and life-changing values. While explaining the importance of a multi-disciplinary curriculum Priyadarshini and Dave (2021) states, "The importance of multidisciplinary curriculum through both disciplinary and professional programmes is to develop competencies of critical thinking, adaptability, and self-management amongst learners. It is the ability to study an issue from different perspectives that leads to the development of critical thinking, analysis, logical thinking, problem-solving and generates competencies of application of knowledge," (p. 70).

So, by integrating curriculum with a multidisciplinary approach we can bring transformation to higher education. By realizing the potential of a multidisciplinary approach to develop a holistic higher education (HHE) in India, the Government of India formulated National Education Policy (NEP)-2020. The Policy seeks fundamental transformation in higher education by implementing innovative and ambitious plans while recognizing the complexities and challenges of higher education.

NEP-2020 vis-à-vis Holistic Higher Education (HHE) and Multidisciplinary Transformative Curriculum

The NEP 2020 aims to develop the intellectual, aesthetic, social, physical, emotional, ethical, and moral facets of an individual in an integrated manner, thereby contributing directly to the transformation of the country and making India a global knowledge superpower. According to NEP-2020 "a multidisciplinary and holistic education across the sciences, social sciences, arts, humanities, and sports for a multidisciplinary world in order to ensure the unity and integrity of all knowledge" (p. 5). The vision of NEP-2020 for Holistic Higher Education in India includes the following key changes to the current system:

1. Moving towards a higher educational system consisting of large, multidisciplinary universities and colleges, with at least one in or near every district
2. Moving towards a more multidisciplinary undergraduate education
3. Moving towards faculty and institutional autonomy
4. Revamping curriculum, pedagogy, assessment, and student support for enhanced student experiences

Table-3: Provisions in NEP-2020 for Holistic and Multidisciplinary higher education

Areas	Provisions
Quality universities and colleges	• Enable students to study one or more specialized areas of interest at a deep level, and develop character, ethical values, intellectual curiosity, scientific temper, creativity, spirit of service, and 21st century capabilities across a range of disciplines including sciences, social sciences, arts, humanities, languages, as well as professional, technical, and vocational subjects. (para 9.2) • Prepare students for more meaningful and satisfying lives and work roles and enable economic independence. (para
Institutional restructuring and consolidation	• By 2040, all higher education institutions (HEIs) shall aim to become multidisciplinary institutions, each of which will aim to have 3,000 or more students. By 2030, There shall be at least one large multidisciplinary HEI in or near every district. • Increase the Gross Enrolment Ratio in higher education including vocational education from 26.3% (2018) to 50% by 2035. • A university will mean a multidisciplinary institution of higher learning that offers undergraduate and graduate programmes, with high quality teaching, research, and community engagement. • There will be 2 types of university in India; (i) Research-intensive Universities (RU) where equal emphasis given on teaching and research and (ii) Teaching-intensive Universities (TU) where greater emphasis given on teaching than research. (para 10.3) • Autonomous degree-granting College (AC) refers to a large multidisciplinary college that grants undergraduate degrees and is primarily focused on undergraduate teaching though it would not be restricted to that. Institutions will have the option to run Open Distance Learning (ODL) and online programmes, provided they are accredited to do so. (para 10.3) • Single-stream HEIs will be phased out over time, and all will move towards becoming vibrant multidisciplinary institutions or parts of vibrant multidisciplinary HEI clusters. The system of 'affiliated colleges' will be gradually phased out over a period of fifteen years through a system of graded autonomy, and to be carried out in a challenge mode. • The overall higher education sector will aim to be an integrated higher education system, including professional and vocational education.
Towards a more holistic and multidisciplinary education	• A holistic and multidisciplinary education would aim to develop all capacities of human beings -intellectual, aesthetic, social, physical, emotional, and moral in an integrated manner. Such a holistic education shall be, in the long term, the approach of all undergraduate programmes, including those in professional, technical, and vocational disciplines. • Even engineering institutions, such as IITs, will move towards more holistic and multidisciplinary education with more arts and humanities. Students of arts and humanities will aim to learn more science and all will make an effort to incorporate more vocational subjects and soft skills. • Imaginative and flexible curricular structures will enable creative combinations of disciplines for study, and would offer multiple entry and exit points. • Departments in Languages, Literature, Music, Philosophy, Indology, Art, Dance, Theatre, Education, Mathematics, Statistics, Pure and Applied Sciences, Sociology, Economics, Sports, Translation and Interpretation, etc. will be established and strengthened at all HEIs.

Areas	Provisions
	• Curricula of all HEIs shall include credit-based courses and projects in the areas of community engagement and service, environmental education, and value-based education. • The undergraduate degree will be of either 3 or 4-year duration, with multiple exit options within this period, with appropriate certifications, e.g., a certificate after completing 1 year in a discipline or field including vocational and professional areas, or a diploma after 2 years of study, or a Bachelor's degree after a 3-year programme. The 4-year multidisciplinary Bachelor's programme, however, shall be the preferred option. • An Academic Bank of Credit (ABC) shall be established which would digitally store the academic credits earned from various recognized HEIs so that the degrees from an HEI can be awarded taking into account credits earned. • Model public universities for holistic and multidisciplinary education, at par with IITs, IIMs, etc., called MERUs (Multidisciplinary Education and Research Universities) will be set up and will aim to attain the highest global standards in quality education. • HEIs will focus on research and innovation by setting up start-up incubation centers, technology development centers, centers in frontier areas of research, greater industry academic linkages, and interdisciplinary research including humanities and social sciences research.

(Source: National Education Policy 2020, retrieved on August 10, 2021)

5. Governance of HEIs by highly-qualified independent boards having academic and administrative autonomy
6. Increased access, equity, and inclusion through a range of measures, including open schooling, online education and Open Distance Learning (ODL), keeping in view the needs of learners with disabilities.

Also, NEP 2020 suggests several policy directions for offering Holistic and multidisciplinary higher education in India. These suggestions are discussed in Table-3:

Conclusion

Higher Education in India is in the process of large-scale transformation. Integration of the 21st century skills like creative thinking, problem-solving, research, and creativity in higher education for the holistic development of learners, is the need of the hour. This can only be achieved through a holistic multidisciplinary approach. After a period of more than three decades, the new National Education Policy–2020 (NEP–2020) was launched on 29 July 20220, emphasizing the importance of multidisciplinary education through both disciplinary and professional programmes for developing competencies of critical thinking, adaptability, and self-management amongst learners. A multidisciplinary approach leads to the holistic development of learners that brings not only the development of knowledge but also skills and life-changing values. However, the challenge now lies in expanding programmes to make them more accessible and attractive for new learners and thereby meeting the challenges of the 21st century. Curriculum plays an important role to overcome this challenge. A multidisciplinary curriculum is one in which the same topic is studied from the viewpoint of more than one discipline. Hence to transform the higher education system; we must first transform the curriculum. A transformative curriculum must be: (i). linked and connected to the life of the learner, (ii) challenging, yet attainable; and (iii) able to inspire students and teachers. So, while designing the curriculum for higher education, it must include all those subjects that empower learners with 'knowledge, skills, values, and attitudes to take informed decisions and make responsible actions for society. The NEP-2020 also suggested some provisions for a Holistic and Multidisciplinary higher education in India that thrives to fulfil the aim of education through 'the Discovery of Self and Professional Excellence' which are the main pillars of the Higher Education System. Thus, by taking forward the roadmap provided by NEP–2020, the Higher Education Institutes (HEIs) would make a major contribution to the development of a sustainable and dynamic knowledge society in India.

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Open Pedagogy, and Lifelong Learning: Curriculum, Contexts and Prospects

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In the 21st century, formal education, particularly higher education has become essential for having a decent standard of living. For developing the power of rationality and critical thinking among learners, education is essential. It is also a pre-prerequisite for the acquisition of knowledge, enhancement of skills, development of the right kind of attitudes and values, etc. for helping them to enjoy a meaningful life. Besides, for the long-term benefit of the nation as well as for the overall well-being of its people, there is a need not only for quality education but also for a kind of education that makes learners more employable and competent. To exploit the enormous potential of education, there has been continuous research and experimentation on different ways of imparting education consequent to which, various systems and policies of education emerged across the world. The idea of lifelong learning is one of the upcoming ideas for enhancing the capacities of individuals at their own pace and requirements.

India is a vastly populated country with a rich cultural heritage and knowledge systems. Even the New Education Policy–2020 (NEP—2020) reiterates that the pursuit of knowledge (*Jnan*), wisdom (*Pragyaa*), and truth (*Satya*) have always been upheld in Indian thought and philosophy as the highest human goals. However, history tells us that the aim of education in ancient India was not just the acquisition of knowledge or the preparation for life in this world or life beyond schooling, but the complete realization and liberation of the self. It has also been seen that there have been so many scholars or individuals who contributed substantially to strengthening the ethos of the Indian civilization without having any higher or formal degrees. They were acquainted with life skills that had helped them to emerge as productive and skillful (Bordoloi, R. AAOU 2021).

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The NEP–2020 has also categorically stated how to make ourselves compassionate to others, how to develop a participatory approach for all stakeholders by ensuring equity and quality higher education to all, and so on. In fact, the NEP---2020 is perhaps the first comprehensive educational policy of the country that deals with how to mitigate the opportunity cost by providing a lifelong learning opportunity for better livelihood. In fact, NEP--2020 is the first of its kind that aims to address the many growing developmental imperatives of the country. The Policy proposes the revision and revamping of all aspects of the education structure, including its regulation and governance, to create a new system that would be aligned with the aspirational goals of 21st-century education, including SDG4, while building upon India's traditions and values systems (NEP 2020, 4).

The NEP–2020 also states that higher education must enable the development of an enlightened, socially conscious, knowledgeable, and skilled nation that can find and implement robust solutions to its own existing and emergent problems. The idea is that higher education must set the basis for knowledge creation and innovation thereby contributing to a growing national economy. Thus, the purpose of quality higher education has been seen as more than just the creation of greater opportunities for individual employees. Higher education must embody the key to more vibrant, socially engaged, cooperative communities for a happier, healthier, cohesive, cultured, productive, innovative, progressive, and prosperous nation (NEP—2020, 4). Therefore, for ensuring a more result-oriented higher education, there is a need for a more comprehensive curriculum and pedagogy in the teaching-learning transactions that deal with the flexible learning models and various tools of online pedagogy that suit the 21st century digital world.

Now, if we consider the role of open pedagogy in recent times, we have seen how it played a very crucial role during the pandemic and post-pandemic situations. People across the world were forced to adopt emergency remote learning, often mistaken

as online learning while accessing educational opportunities uninterruptedly. However, the usability of the latest online pedagogy or technological tools varies from country to country, state to state, and region to region. The 'One size fits all' concept will not work, and it is rather contextual and specific to the nature of the culture and the situation. Therefore, before putting certain innovative ideas into practice, one must take into consideration many variables, including the target group of learners, their social and economic background, their age range, their access to technological infrastructure, and so on. Some countries and regions are in a more advantageous position to take pro-action to initiate online or emergency teaching-learning practices as a resilient educational delivery mechanism more promptly. On the other hand, some regions even may not be able to adopt the resilient mechanism for meeting present and future uncertainties.

Moreover, it should also be mentioned that open pedagogy for educational delivery should be used by considering the affordability and accessibility of the learners who want to pursue and continue their educational journey for enhancing their knowledge, skills, and values of life. In this context, the Open universities and ODL institutions of the country can play a pivotal role as the learners are more familiar with the use of the latest educational technologies rather than the students of the traditional settings. In fact, in this context the NEP–2020 also remarks: Institutions will have the option to run Open Distance Learning (ODL) and online programmes, provided they are accredited to do so, to enhance their offerings, improve access, increase GER, and provide opportunities for lifelong learning. All ODL programmes and their components leading to any diploma or degree will be of standards and quality equivalent to the highest quality programmes run by the HEIs on their campuses. Top institutions accredited for ODL will be encouraged and supported to develop high-quality online courses. Such quality online courses will be suitably integrated into the curricula of HEIs, and blended mode will be preferred (NEP 2020, 35). It has also been observed that the acquisition of life skills is the most essential way of having a productive life for an individual in any crisis. Hence, open education or open learning can provide the scope for skilling, re-skilling, and up-skilling the life skills mechanism of the individuals according to the demand of the situation. However, modern-day India has its own specific challenges to meet. For that the educational delivery methods and methodologies should be designed in such a way that other than providing access to formal education, proper training should also be given to the students regarding how to handle the problems of personal life, form study habits, maintain relationships with peers and other members of society, handle pressure at workplace, etc. Such skills which enable a person to tackle various stressful situations in life and to lead a happier life are called life skills. The World Health Organization has defined life skills as "the abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of everyday life." According to WHO, life skills encompass personal, interpersonal, physical, and cognitive skills that facilitate people to organize and manage their lives and to develop the capacity to live with and produce a change in their environment. The focus on life skills made by the World Declaration on Education for All and Framework for Action to Meet Basic Learning Needs (1990) is also notable. The Delors Commission Report (1996) also suggested that education is based on the four pillars, i.e.-Learning to know, learning to do, learning to live together, and learning to be.

Therefore, this paper intends to discuss how lifelong learning can be promoted for the better well-being of the learners by using the latest curriculum and pedagogy that would prepare them to confront any future uncertainties.

Objectives of the Paper

The main objectives of the paper are:

1. To discuss how a well-planned open pedagogy can provide lifelong learning opportunities to all.
2. To find out how Open and Distance Learning can provide opportunities for learning, unlearning, and relearning even during a crisis.
3. To explore how open pedagogy could revamp the Indian education systems in light of NEP ---2020.

The Role of the Open Learning

For a country like India, there is a need for the democratization of education so that everyone enjoys equal opportunities and justice in every sphere of life. However, the 21st century education must combat all forms of exclusiveness and instead

put in place newer ways of imparting education with equity. Here, the idea of Open Educational Resources (OERs), Massive Open Online Courses (MOOCs), etc. can prove very handy as they would provide educational opportunities to all sections of people and thereby help in realising Freire's views in a more engaging way.

Here, one needs to have a clear idea of the term pedagogy. As stated by Bordoloi (2020), pedagogy is a technique, an approach, a process, or a method that would help to make teaching-learning more effective. Due to the explosion of science and technology in the 21st century, one needs to adopt up-to-date transactional behaviour while imparting education. The systematically designed behavioural taxonomy also suggests that it could guide the teachers in using appropriate pedagogical tools and techniques to meet the goal of educational instruction. In fact, in a learner-centered approach, through proper use of pedagogy, learners can reap the benefits, and internalise the curriculum or the content in their own way. Besides**,** *the engagement of the students or learners during the courses and their emotional support* are the two key factors that should be considered while designing and offering the courses for the learners. Therefore, today the policymakers, as well as the academicians, are more in favour of the use of *the community inquiry-based model* for teaching-learning transactions that meet the *cognitive, teaching, social as well as emotional needs* of the learners while delivering course contents through an online or blended form.

Bordoloi (2020) also mentioned that the traditional chalk-and-talk-method is being continuously replaced by different new methods such as *collaborative learning, project-based or teamwork learning, personalised and customized learning,* etc. that would provide new opportunities for the learners for bringing out their creativity and innovative ideas and thoughts. In fact, these new methods and techniques are to be considered essential for teachers to motivate learners to explore different applications of knowledge and skills in their day-to-day life. As we already know, in the industrial era, the use of ICT in the ODL system has made many changes in the entire fabric of teaching and learning transactions.

As part of the learner-centered approach therefore, there is a need for learner-centric pedagogy that also provides scope to the learners for reaping the benefits of experiential learning as well as skill-based learning. In fact, it is through Open and Distance Learning (ODL) that by using the various forms of pedagogy, lifelong educational opportunities as well as world-class education could be provided to the learners irrespective of age, sex, geographical barriers, and economic classifications as well as discriminations. Besides, to bring up peace and prosperity among the people and the planet, there is a need for sustainable education where ODL has emerged as one of the most potent factors because of its preference for an independent form of learning.

The basic idea of teaching-learning at any given time should be to build up the capacity of a learner for developing their communication skill, collaborative skills, creativity, critical thinking skills, and so on. In the 21st century, Open Educational Resources (OERs) have markedly influenced teaching-learning transactions following which the idea of a traditional classroom has been replaced by the increasing use of the internet and social media. Thus, a new type of social constructivism has already evolved for the benefit of the learner so that he can directly interact with the people in his community, share ideas and thoughts with his teachers and peers and collectively undertake new research which can genuinely transform the society.

This kind of constructivism may prove to be very useful in the context of the pandemic. During the Lockdown in India caused by the outbreak of the COVID-19 pandemic, there was a need to reconsider the idea of pedagogy. The behavioural taxonomy also suggests that it could guide the teachers/educators/ instructors in using the appropriate pedagogical tools and techniques to fulfill the mission and goal of educational instruction. Thus, pedagogy in the time of the pandemic should not only consider the changing environment of the teaching-learning process but should also determine the expected outcome of the teaching-learning transactions in a crisis. Of late, various educational tools can facilitate lifelong educational opportunities for learners irrespective of their age, sex, geographical location, economic background, and so on. For example, mention may be made of *Connected Educator* which promotes networked approaches to the learning system, *Blogger* which may be used as pedagogy for transacting educational content by posting educational links, lessons, assignments, tests, etc.

Besides these, social media such as *Facebook, Twitter, Instagram, YouTube, WhatsApp,* and so on can become the most effective, common, and popular platforms to share and search educational material at the doorstep (Bordoloi, 2020).

In order to ensure a sustainable education system as well as to meet the mission and vision of the present governmental initiations like 'Start-up India', 'Skilled India','*Atmanirbhar Bharat*', etc., everyone should reap the benefits of the techno-based education in an equitable manner. Hence, it needs serious consideration that from the elementary level onwards, practical forms of education should be made available in both the private and government sector schools and institutions through the optimal utilisation of available online/digital/blended resources. In this context, digital tools like *Edmodo* can be used to discuss at least some skill-based content among the learners of different stages starting from the primary to the higher levels so that they can cope with the unprecedented environment of learning as in the case of the Lockdown caused by the COVID-19 pandemic or similar other situations.

Besides the latest developments in the adoption of CBCS (Choice Based Credit System) starting from school education to higher levels are going to transform the entire education system of the country. This will also provide opportunities for the learners to reap the benefits of a global form of learning. In this context, it seems, even in the pandemic situation, the creation of LMS (Learning Management System) is one of the most effective ways to offer the required means of education at the doorsteps of every learner located in different corners of the world. Therefore, it is the right time to formulate a national policy to introduce LMS-based learning from school education to higher education. In fact, using LMS, both the conventional and ODL institutions can share their educational content among the learners of both systems. This can be a major change that might transform education itself.

The UGC ODL Regulations 2020, is to be considered a major boost to ODL in India. It has also categorically referred to the use of e-resources and stated that all Higher Educational Institution (HEIs) offering programme(s) in ODL mode. It shall take such measures as are necessary to blend Information and Communication Technologies (ICT) including those developed by the National Mission on Education through Information and Communication Technology (NMEICT) for enhancing the effectiveness of teaching–learning process and administrative functioning and for maintaining of updated information at all times in respect of the status of admissions, registration; for managing teaching-learning activities through online support for interactive learning with learner feedback to facilitate the use of OER, MOOCs and for continuous as well as comprehensive evaluation, certification, and other aspects of learner support. The Regulation also states that an HEI may allow up to 40% of the total courses being offered in a particular programme in a semester through the Online Learning courses/MOOCs and that education should promote the development of life skills such as communication, cooperation, teamwork, and resilience. This should be considered a great opportunity for a country like India.

Considering the digitalisation of education as the way to ensure '*Atmanirbhar Bharat'*, the Union Budget (2021) emphasized the online learning environment and allocation of more funds to strengthen the digital infrastructure in India. The NEP 2020 also anticipated an increase in government education spending from 10% to 20% by 2030, with an emphasis on supporting higher education, bringing down gender, social and economic gaps, etc. Guidelines for enforcing this inclusive strategy for allocating funds to different areas, such as K12, STEM education, and higher educational institutions, and bridging the digital gap between Tier 1, 2, and 3 cities through the implementation of technology in the education sector, are visualised.

Conclusion

In the present knowledge society, there is no doubt about the fact that ODL and online education have provided myriad educational opportunities and have enhanced access to different need-based courses, knowledge, and information for all those who would like to be engaged in lifelong learning for a better livelihood. It is also important to note that Sustainable Development Goal 4 (SDG4) has made a reference to 'ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all.' (SDG4) SDG4 is part of the 2030 Agenda for Sustainable Development,

adopted by all UN Member States in 2015. Thus, Lifelong learning has today become essential for survival and for enhancing people's quality of life, as well as for national, human, social, and economic development. If a country wants to compete globally and emerge as a developed nation, it has to improve the quality of its human resources through well-defined lifelong education policies and programmes.

Different coordinating agencies are facilitating various MOOCs in the SWAYAM platform. Taking a MOOC through SWAYAM needs to be made compulsory for both the learners as well as teachers so that learning never gets interrupted. Most specifically, in a pandemic like situation, the coordinating agencies may play even a bigger role by offering need-based courses which can not only help the learners in getting the benefits of the credits earned but also keep them busy in a crisissituation in a more productive way. However, the evaluation system should also be reformed. Various online based examination systems, on-demand examination etc. should be made by considering the learners' needs and situations. May be, this is also the time, we could think of offering open book examination system for the learners who suffered due to the Lockdown. Similarly, the examination model conducted by the National Testing Agency (NTA) could also be adopted as a model.

It is expected that through massive investments in ed-tech and blended form of learning, the NEP 2022 would further enhance integrated, experiential and immersive learning while enhancing vocational training and retraining facilities, non-academic education and improving skill growth to increase India's employability ratio that would help to build a modern India. (Union Budget, 2021) However, the idea of pedagogy in the 21st century contexts, should be linked with the digital and techno-based society so that various digital technologies can be used for disseminating information and knowledge for the learners. In the post pandemic situations, the use of such pedagogy is of utmost importance so that even in any future crisis, meaningful and useful learning can continue to take place.

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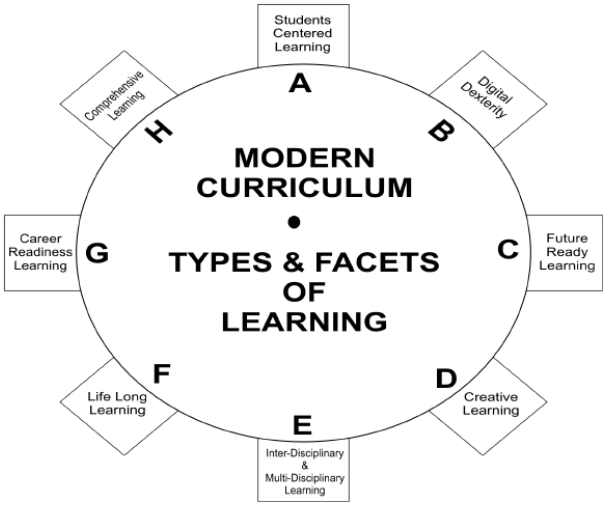
Modern Curriculum: Types and Facets

Deepak Mistry*

Society is a dynamic entity that keeps on changing. There are various factors that influence these changes. These changes bring along various multi-faced issues. In India, despite unprecedented growth and development in the last 75 years in social, economic, political, education, health, technology, and other areas; poverty, hunger, inequality, provision of basic facilities, ecology, conflicts, religious harmony, and many other issues remain to be tackled. Education has always been used to bring change and development to society. This interconnection between education and society makes education and the future inseparably intertwined. And 'Curriculum' being base of education, it must be reviewed, revised, and rejuvenated now and often. It must be 'Modern' and address future problems of society. A glimpse of Modern Curriculum and Facets of Learning is provided in Figure -1.

Figure-1: Modern Curriculum and Facets of Learning



The Curriculum is the formal and informal content and process by which learners gain knowledge and understanding, develop skills, nurture attitudes, inculcate values under the set-up of an academic institution. Any dimension of knowledge or belief system to be disseminated is done through curriculum. The Curriculum provides the basis for the construction of knowledge from schools to colleges to universities to research institutions to finally into society. As we move ahead in the hierarchy, it gets broader and deeper in essence, theory and practice. Curriculum is not only the content selected and delivered, but also the planned and unplanned activities in which individuals participate as students. It is the total experience. The curriculum is the instructional and the educative progamme by following which the pupils achieve their goals, ideals, and aspirations of life. It is the whole process through which the aims and objectives of 'Education' receive concrete expression.

The curriculum is not the syllabus and academic content of various subjects and disciplines. Rather it is an implied contract between society, the state, and the educational fraternity that learners should undergo during a certain phase of their lives to learn something desirable, relevant, and motivating.

Over time many curriculum paradigms have evolved. They are strong on theory and academic vigour. In the last decade or so, it was realised that most of the curriculums developed on core subjects are lacking the skills required by learners to fit into the new industrial, digital, knowledge-base, and social environment emerging in the Globe. Various life skills, innovative skills, collaborative skills, high-order thinking skills, and digital dexterity were missing. These are proved by research to be necessary and essential for personal, career, and social success and satisfaction.

Making of Modern Curriculum

'Modern Curriculum', is a curriculum that is student-centric, socially relevant, creative, forward-looking, flexible, provides for livelihood, emphasizes national and cultural heritage, recreational activities, and environment protection shall reflect the complexities of life, integrated with life skills, soft skills, critical thinking skills and develops values like honesty, trust, empathy, integrity, tolerance, respect for others, good human. It should provide a wholesome experience, and clearly defined learning.

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Guiding principles for developing such a curriculum shall be the curriculum logic, the curriculum priority the bare minimum, and 'the add on' of the core subject matter, interest and passion, community and country needs, practices and processes, goals, and outcomes.

Essentials For Curriculum Developer

Essential for Curriculum Development is clarity of mind and purpose as to:

- Why and to what purpose is a curriculum developed?
- For whom is the curriculum primarily developed?
- What should the curriculum address?
- How should the curriculum be realised?

The Developer shall ensure that the 'curriculum'

- Meet demands of globalisation
- Solve the needs of the society and community
- Encourage the application of knowledge
- Is developing core competencies in the domain
- For professional students, it helps develop their specific level of professional competences
- Is interdisciplinary
- Has a didactic approach
- Is Cost-effective
- Is Flexible in implementation
- Is Up- to- date and sustainable

Curriculum Design Principles Shall Take Care of the Following:

- **Student centric:** The curriculum should be designed around students to motivate them and recognise their prior knowledge, skills, attitudes, and values.
- **Rigour:** Topics should be challenging and enable deep thinking and reflection.
- **Focus:** A relatively small number of topics should be introduced to ensure the depth and quality of students' learning. Topics may overlap in order to reinforce key concepts.
- **Coherence**: Topics should be sequenced to reflect the logic of the academic discipline or disciplines on which they draw, enabling progression from basic to more advanced concepts.
- **Alignment:** The curriculum should be well-aligned with teaching and assessment practices.. New assessment methods should be developed that value student outcomes and actions that cannot always be measured.
- **Transferability:** Higher priority should be given to knowledge, skills, attitudes and values that can be learned in one context and transferred to others.
- **Choice:** Students should be offered a diverse range of subjects and project options, and the opportunity to suggest their own with the support to make well-informed choices.
- **Teachers Engagement:** Teachers should be empowered to use their professional knowledge, skills and expertise to deliver the curriculum effectively.
- **Authenticity:** Learners should be able to link their learning experiences to the real world and have a sense of purpose in their learning. This requires interdisciplinary and collaborative learning alongside mastery of discipline-based knowledge.
- **Inter-relation:** Learners should be given opportunities to discover how a topic or concept can link and connect to other topics or concepts within and across disciplines, and with real life outside of university.
- **Flexibility:** The concept of "curriculum" should be developed from "predetermined and static" to "adaptable and dynamic". University and faculties should be able to update and align the curriculum to reflect evolving societal requirements as well as individual learning needs.
- **Engagement:** Faculties, students and other relevant stakeholders should be involved early in the development of the curriculum, to ensure their ownership for implementation.

Curriculum Reforms Face Five Challenges

- **Curriculum overload :** Resulting from the needs and requests of parents, universities, and employers,
- **Time lags :** Time lags between recognition, decision making, implementation, and impact of reforms,
- **Quality of content:** Must be of high quality if students are to engage in learning and acquire deeper understanding

- **Equity:** While innovating; all students, not just a select few, must benefit from social, economic, and technological changes.
- **Implementing:** Careful planning and alignment are critically important for effective implementation of reforms.

Types of Learning

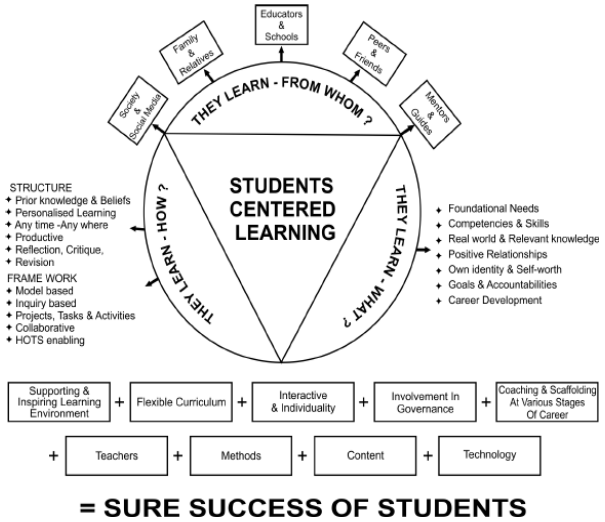
Students Centered Learning

As the heading goes, Student-Centered Learning (SCL) makes students co-creators of their own education, engaging them in decisions about what, from whom, and how they learn. In doing so, SCL helps students not only with academic knowledge, but also with the skills of self-direction, curiosity, creativity, and collaboration they'll need for future success.

Students succeed when what they're learning matters to them. In SCL students' interest drives education. SCL gives students the opportunity to decide two things: what material they learn and how they learn it. (This concept is also sometimes referred to as personalized learning). In contrast to teacher-centered approaches, SCL engages students as leaders and decision-makers in their own learning.

Students plan their own research, propose a solution, communicate their ideas to teachers and community members, and evaluate their own progress as they go. Teachers help guide this process, but the content, timing, and motivation are down to the students themselves (Figure-2).

Figure-2 Student Centred Learning



Role of Curriculum in SCL

Curriculum plays a central role in SCL. But instead of the traditional model, where students and teachers follow the same script, SCL uses its curriculum as a resource to spark student interest and guide rigorous inquiry. "Everything's open for discussion: what they do and what they don't do and how they approach it. It gives them the opportunity to pick their projects as long as it has this standard in them, and then master this competency within it. Students learn to engage with adults and speak in front of a diverse audience. This makes them more comfortable sharing their work, better speakers, and more confident. It challenges them in terms of critical thinking and analysis.

Role of Teachers in SCL

In student-centered learning, teachers serve as experts and key sources of knowledge, and students share responsibility for accessing that knowledge. Teachers are also resources for connecting students with partnerships outside of the classroom.

Educators, Mentors, and Guides can have meaningful engagement by:

- Helping students adjust to a new and different learning environment
- Helping students envision how successful learning looks
- Giving students the chance to express their ideas in their terms
- Helping to set the goals of student-centered classes
- Helping students learn how to set and achieve their personal, educational goals
- Giving students enough room to fail and learn from their missteps
- Helping students develop their critical-thinking and self-reflection skills
- Giving students the space to act as their advocates in the learning process
- Showing students specific techniques for accessing the information relevant to their interests

Common Features of SCL

Because SCL is so personalized for each student and community, it can take many different forms. However, successful SCL programs share some common features:

- Emphasis on project-based, interdisciplinary learning
- Deep connection between curriculum and student interests
- Assessment as a tool to measure learning and help students grow
- Meaningful feedback platforms for students and families
- Learning plans tailored to individual students
- Flexibility and adaptability—especially evident during the shift to virtual learning.

Benefits of SCL

- Personalization improves students' attitudes towards learning
- Service and project-based learning increases student engagement
- Teaching students how to self-regulate, improves their academic performance
- Stronger relationships between students and teachers through shared experiences. improvements in students' communication and collaboration skills
- Advances in students' ability to think and work independently
- Increased student interest in school / college activities and education in general

Digital Dexterity (DD)

Technology is reshaping the landscape of education in both K-12 and higher education settings, offering greater levels of flexibility, personalization, and innovation. The current situation of education throughout the world is analogous; the education industry is experiencing a revolution and technology is playing a vital role. The idea that technology would become a principal educational tool was just starting to come to fruition with the invention and widespread adoption of the internet.

DD is the ability of learners to adapt and adopt existing and emerging technologies in their field to produce better results for their education / employ education/employment the digital world is constantly changing, and the desire to adapt and innovate using new technologies is important for learners.

The level of digital dexterity can affect all the learners, the institute, the society. At the institute level, a digitally forward institute is more agile, open to change, and ready to adopt new technologies, leading to a host of benefits for the institute, learners ,teachers and staff.

How Technology is Changing the Education Industry?

It has changed how students learn, making education accessible in ways we never imagined. Today students can get details about the admission process- profile of the institution- courses and curriculum- assessments & certifications- fee structure scholarships - residency and facilities and a host of basic information online before embarking on their journey of higher education. Students conduct research from their laptops, enroll in online courses, and livestream lectures from anywhere with a Wi-Fi connection. Even something as simple as taking notes has shifted from pen and paper to digital devices. The Advent of the Word Processor, The TI Graphing Calculator, High-speed broadband, Tablets, Smartphones, Personal Computers and Research Databases on the World Wide Web, Podcasts and Video Stream Lectures, Classroom Presentations, and Online Learning is all due to technological advancements.

But while technology can offer greater access and convenience, social and economic factors can severely limit access to technology for all students. Things like high-speed broadband, personal computers, smart phones and tablets are inaccessible, even in this modern day, in rural districts and most of the schools and colleges in India. Despite these barriers, technical advancements continue to reshape how students learn. DD is advancing at a dizzying pace, with more changes on the way. In the years to come, artificial intelligence, virtual reality, and chatbots using machine learning will personalize curricula for students and offer self-paced learning in ways never before possible. We don't know where will it end and will it replace physical institutions soon or not !!

Going forward, the dependence on technology to promote collaboration and a sense of belonging so that remote students/ teachers/ staff stay connected and engaged in the 'new normal' will be more important than it has ever been before.

Future Ready Education

Need For Broader, Skills-Based, Competency-Based & Value Based Knowledge

In the face of an increasingly volatile, uncertain, complex, and ambiguous world, education can make the difference as to whether people embrace the challenges they are confronted with or whether they are defeated by them. And in an era characterised by a new explosion of scientific knowledge and a growing array of complex societal problems, *it is appropriate that curricula should continue to evolve, perhaps in radical ways*.

All stakeholders are responsible and have to participate in making education future relevant be they government representatives or a growing community of partners, including thought leaders, experts, school/colleges networks, principals-faculties-teachers researchers, leaders, students, and youth groups, parents, universities, local organisations and social partners.

This is Work-in-Progress

Unless steered with a purpose, the rapid advancement of science and technology may widen inequities, exacerbate social fragmentation, and accelerate resource depletion. In the 21st century, we are aiming at well-being. But well-being involves more than access to material resources, such as income and wealth, jobs and earnings, and housing. It is also related to the quality of life, including health, civic engagement, social connections, education, security, life satisfaction, and the environment. Equitable access to all of these underpins the concept of inclusive growth.

Education has a vital role to play in developing the knowledge, skills competencies, attitudes, and values that enable people to contribute to and benefit from an inclusive and sustainable future. Learning to form clear and purposeful goals, work with others with different perspectives, find untapped opportunities and identify multiple solutions to big problems will be essential in the coming years. Education needs to aim to do more than prepare young people for the world of work; it needs to equip students with the skills they need to become active, responsible, and engaged citizens.

Two factors help learners to be future ready. The first is a personalised learning environment that supports and motivates each student to nurture his or her passions, make connections between different learning experiences and opportunities, and design their own learning projects and a process in collaboration with others. The second is building a solid foundation: literacy and numeracy remain crucial. In the era of digital transformation and with the advent of big data, digital literacy and data literacy are becoming increasingly essential. Similarly for personal satisfaction, to enjoy life to its fullest, for family and society's well-being, and also for physical health and mental well-being, knowledge should be broad-based. In addition to sound fundamental education, the learners should possess various skills and competencies like communication, listening, inter-personal, and values like honesty, integrity compassion, and empathy among others.

Creative Learning

Creative Learning(CL) is not memorizing information. It's building knowledge and developing skills using creative techniques. Rather than dictating how information should be absorbed, creative education guides the learner through the instruction process using creative methods. And it challenges the obvious, the conventional, and the assumed. To some extent, it's about breaking out of set boundaries and constraints.

The term creative learning covers lifelong learning and applies to a range of settings. It's there everywhere where learning takes place – in and out of formal education. CL stimulates problem-solving, promotes risk-taking, develops critical thinking, builds a curious mindset, and increases confidence levels. All cultural activity has the capacity to inspire learning by its very nature. Artistic experiences can challenge and influence how we respond to the world in reflective and imaginative ways.

CL will cover a set of sub-skills like logical thinking, rational thinking, objective thinking, anlysis, synthesis, and evaluation of alternative ideas and hypotheses, consideration of contrary views, embracing debate, discussion, and brainstorming sessions, searching for credible data, evidences, and informations ready for mid-way course corrections, ready to learn from mistakes, seeing opportunities in mistakes. CL has huge benefits for individuals and society in terms of well-being, employability, and skill development.CL techniques can have following sequencing:

- Hypothetical scenarios
- Improvisation (with exercises or games)
- Analogies
- Brainstorming sessions and debates
- Storytelling
- Selecting the most appropriate proposition

Developing Creative Learning

Creating Learning will be at its best when institutions take care of providing conducive settings by:

i. ***Making available appropriate physical spaces.***
ii. ***Making Available Appropriate Materials***
iii. **Working outside the classroom/school**
iv. **Assigning novel tasks and projects in real context**
v. **Making learning-teaching 'Playful' or 'games-bases'**
vi. **Ensuring Respectful relationships between teachers and learners**
vii. **Having interactions at other places and with other people.**

Making Available Appropriate Physical Spaces.

The space within a classroom or workshop should be capable of being used flexibly to promote pupils creativity, and to give imagination greater freedom. Students should be involved as much as possible in planning and resourcing these spaces. There should be a general sense of openness and spaciousness. The sensory qualities in learning environments – light, colour, sound, ambience, micro-climate – influence students and young people's perceptions of how creative they are able to be within them. The use of small spaces ('mini ateliers'), acoustically but not visually separate from the rest of the class can enable pupils to work quietly in groups. Another important feature of the visual environment to stimulate pupils' creativity is displays of their work. As with physical environments, there is reasonable evidence that creativity is best served through flexible use of time. Students need sufficient time for immersion in an activity in order to realise creative outcomes. The importance of extra-curricular activities and time spent outside the normal constraints of the classroom is further emphasized.

By Making Available Appropriate Materials

In the context of learning activities involving the making of artefacts (for example during art and design or design and technology) providing a wide range of appropriate materials, tools and other resources can stimulate creativity. The availability of lots of light, almost formless materials which can take on any shape, such as clay, modelling foam, wire, cellophane, tissue paper, etc. and for older pupils, access to enhanced or specialist resources appears to stimulate creativity. Access to new or different media and technologies can stimulate creativity by staff members and young participants alike. It is also important to have a range of material, technical and reference resources, available outside timetabled hours to bring out their full potential.

Working Outside the Classroom/School

Taking pupils out of the classroom and working in an outdoor environment for part of their time in school can foster their creative development. Outside learning activities were more likely to involve collaboration and provide an alternative teaching environment, to complement the indoor curriculum. In outdoor collaboration often older pupils were seen positioning themselves as both teacher and researcher for younger children (peer interaction).

Assigning Novel Tasks and Projects in Real Context

To stimulate creative responses from pupils, activities need an element of novelty in the task or project. It should be set within as real a context as possible. Activities, tasks, and projects shall be interesting, motivating, and relevant with exciting starting points and stimulus materials to develop and open the pupils' minds. Children and young people should be given some control over their learning and supported to take risks with the right balance between structure and freedom to enhance their creativity.

Making Learning-Teaching 'Playful' or 'Games-Based'

The role of play in early years pedagogy is well documented. Bringing more 'playful' or 'games-based' approaches into classrooms at all ages can support the development of creative skill.

Ensuring Respectful Relationships Between Teachers and Learners

Students prefer pedagogic relationships in which there is mutual respect. Regularly scheduled conversation between children and teachers serves as a framework to support children's work. It supports and sustains a culture and community that fosters creativity. Interpersonal exchange, negotiation of conflict, and comparison of ideas and actions are the decisive elements to develop mutual trust and consequently free mind and creativity. It is a general air of humour and enjoyment of language to enhancefreedoms and creativity.

Having Interactions at Other Places and With Other People

An effective strategy was for the teachers, mentors, or other staff members to visit the spaces in which the young people spend their time outside school, such as youth clubs or local parks. Making connections between such 'informal' spaces, other out-of-school locations, and the school environment increased engagement, motivation, and hence creative outcomes. Involvement with outside agencies, including the local business community, the wider sporting, and Arts community, peer institutions, and other community organisations can significantly contribute to a creative learning environment.

Inter-Disciplinary & Multi-Disciplinary and Trans-Disciplinary Learning

The modern mind divides, specializes, and thinks classified whereas the ancient instinct was the opposite, to take the widest view, to see things as an organic whole. Previously, men could be divided simply into the learned and the ignorant, those more or less the one, and those more or less the other. But specialist cannot be brought in under either of these two categories. He is not learned, for he is formally ignorant of all that does not enter into his specialty; but neither is he ignorant, because he is 'a specialist 'and 'knows' very well his own tiny portion of the universe. He is a person who is ignorant, not in the fashion of the ignorant man, but with all the petulance of one who is learned in his own special line. The persons capable of "wide survey" and "holistic approach" often become 'visionary'.

An article in the Social Science Journal attempts to provide a simple, common-sense, definition of interdisciplinarity, by passing the difficulties of defining that concept and obviating the need for such related concepts as transdisciplinarity, multidisciplinary, etc. "To begin with, a discipline can be conveniently defined as any comparatively self-contained and isolated domain of human experience which possesses its own community of experts. Interdisciplinarity is best seen as bringing together distinctive components of two or more disciplines. In academic discourse, interdisciplinarity typically applies to four realms: knowledge, research, education, and theory.

Interdisciplinary knowledge involves familiarity with components of two or more disciplines. Interdisciplinary research combines components of two or more disciplines in the search or creation of new knowledge, operations, or artistic expressions. Interdisciplinary education merges components of two or more disciplines in a single program of instruction. Interdisciplinary theory takes interdisciplinary knowledge, research, or education as its main objects of study.

In turn, interdisciplinary richness of any two integration of knowledge or research, or education can be ranked by weighing four variables: the number of disciplines involved, the "distance" between them, the novelty of any particular combination, and their extent of integration. A simplified meaning of various terms related to Discipline is given in Table-1

Table-1: Simplified Meaning of Various Terms Related to Discipline

Discipline	One Line Meaning
Intra-disciplinary	Working within a single discipline
Cross-disciplinary	Viewing one discipline from the perspective of another.
Multi-disciplinary	People from different disciplines working together, each drawing on their disciplinary knowledge, but staying within their boundaries.
Inter-disciplinary	Integrating knowledge and methods from different disciplines, into co-ordinated and coherent whole.
Trans-disciplinary	Integrates the natural, social and health sciences in a humanities context, and transcends their traditional boundaries.

Importance of ID/MD Knowledge

Interdisciplinary knowledge and research are important mainly because:

— Creativity often requires interdisciplinary knowledge.

— Participants often make important contributions to their new field.

— Many intellectual, social, and practical problems require interdisciplinary approaches.

— Interdisciplinarians may help breach communication gaps in the modern academy, thereby helping to mobilize its enormous intellectual resources in the cause of greater social rationality and justice and indirectly bringing ' academic freedom '

A few examples showing the importance of Inter disciplinarity/ multidisciplinary studies :

(i) **Quantum Information Processing:** An amalgamation of quantum physics and computer science, and (b) bioinformatics, Microbiology department, molecular biology with computer science.

(ii) **Sustainable Development** as a research area deals with problems requiring analysis and synthesis across economic, social, and environmental spheres; often an integration of multiple social and natural science disciplines.

(iii) **Development of COVID-19 Vaccines** at Cambridge university- Astra-Zeneca in UK or Moderna-Pfizer in USA involved research experts from the field of bio-chemistry, virology-infectious diseases, immunogenicity studies scientists, molecules chemistry scientists, microbiology department, clinical trials, popular media & education programs, economic and supply considerations, hefty financial support from industry and government, departments to coordinate and tackle various technical, legal, regulatory, economic and cultural barriers.Detailed Understanding and Examples of Interdisciplinary & Multi/Trans Disciplinary Explained in Table -2.

Thus, the terms can seem interchangeable because of their vague and similar definitions. Call it multidisciplinary studies, interdisciplinary studies, or general studies — in every case, it makes for a degree program that's flexible and allows you to build a degree plan choosing courses from multiple academic disciplines.

- A discipline is a field of study. So, a multidisciplinary (or interdisciplinary) course is a team-taught course in which students are asked to understand a single subject as it's seen by two or more traditional disciplines. Multidisciplinary teaching can open students' eyes to different views of a subject that they had never considered before

- A degree in Interdisciplinary and Multidisciplinary Studies can be an excellent foundation for : teaching, graduate work, social services delivery, journalism or creative writing, advocacy in an area of interest, communications, arts, and law.

- That's why in today's hyper-competitive world, limitless learning, a unique educational system that promotes a multi-disciplinary approach to help students follow their passion is vital. Although the National Education Policy 2020 (NEP 2020) has asked institutions to pay attention to it, stakeholders are still in a dilemma about its advantages & disadvantages.

General Examples of ID/MD Studies

- A student, who's pursuing a career path as a documentary photographer, can study World Languages and Cultures, Journalism, and Geography. Another, who works for a startup company creating videos for marketing, can study Business Basics, Media Arts, and Communication Studies.

- A student might combine courses in Education, Communication, Arts and social services , that would enhance his or her career opportunities. Another student may choose to tailor their academic journey with courses in Nutrition, Education, and Biology. Another still may combine Business Administration (MBA), Organizational Development and Leadership, and Communication.

- Medical studies and treatment require a multidisciplinary approach involving physicians, nutritionists, psychologists, trainers, and gynecologists …

- The task of interpreting the space science and astronomy spectrum … will take a multidisciplinary team of astrophysicists, Earth scientists, climate scientists, and biologists

- And nanotechnology may change the way we think about mechanical engineering altogether, making

Table-2: Detailed Description of Inter-disciplinary, Multi-disciplinary and Trans-disciplinary Education

Inter-disciplinary (ID)	Multi/ Trans-disciplinary (MD/PD)
This approach involves integrating knowledge and methods from different disciplines, using a real synthesis of approaches.	In this approach people from different disciplines are working together on a common problem- project, each drawing on their disciplinary knowledge.
Interdisciplinary education refers to teaching of those concepts which requires learning a single subject from multiple perspectives. Interdisciplinary education is considered best when it comes to boosting the learning outcomes and making the whole understanding process interesting and enthusiastic for the students.	Multi/Trans disciplinary education brings inte-gration of different disciplines in a harmonious manner to construct new knowledge and uplift the learner to higher domains of abilities and sustained knowledge and skills. It is a type of learning relating to, or making use of, several disciplines at once in order to enhance the overall scope and depth of learning.
Interdisciplinary teaching allows students to think critically, identify their own prejudices, accept the unknown and respect ethical quandaries enabling the students to understand different insights and perceptions of different disciplines. ID synthesizes information surrounding a topic and, ultimately, offers a more complete & comprehensive understanding of an issue.	It is an approach to curriculum integration that dissolves the boundaries between the conventional disciplines and organizes teaching and learning around the construction of meaning in the context of real-world problems or themes. The most challenging aspect of being an multidisciplinary major is that you must narrow your focus to at least two specific fields.
Interdisciplinary teaching goes beyond multi-disciplinary teaching which is a bit more complicated due to its requirement of multiple teachers or educators and their mutual collaboration to execute the approach properly.	Multidisciplinary Studies - Is combining the disciplines of many / several different branches of learning **or** - Combining several fields of study / academic interests **or** - Making use of several disciplines at once **or** - Multiple areas of study.
Thus an ID study is an academic program or process seeking to synthesize broad perspectives, knowledge, skills, interconnections, and epistemology in an educational setting. Interdisciplinary programs may be founded in order to facilitate the study of subjects that have some coherence, but which cannot be adequately understood from a single disciplinary perspective (for example, climate studies, hunger & poverty, women's studies, developing a vaccination pro-gramme - you need to study them from different angles and then integrate and coordinate to reach to the core). At a more advanced level, ID may itself become the focus of study, in a critique of 'institutionalized disciplines' ways of segmenting knowledge.	Multidisciplinary education is a unique educational approach that allows the students to learn & explore distinct subjects or curriculum from various disciplines. Education is not limited to a particular discipline. For instance, a student of Engineering can take a subject from humanities. Multidisciplinary approach is a method of curriculum integration that highlights the diverse perspectives that different disciplines can bring to illustrate a theme, subject, or issue. In a multidisciplinary curriculum, multiple disciplines are used to study the same topic.

it a more multidisciplinary field, one as concerned with atomic-level effects as electrical engineering or physics, chemistry, and safety engineering...

When we speak of the hierarchical educational structure, the concept of "learning" gets bounded with so many aspects such as – curriculum, teaching-learning methodologies, time limitations, and much more. In a crux, the vision of education gets compromised.

Interdisciplinary or multidisciplinary studies will not only broaden the vision but will also create new knowledge and pathbreaking innovations. The

Pros and Cons of Inter-Disciplinary Studies are given in Table 3.

Table 3 :Pros and Cons of Inter-Disciplinary Studies

Pros	Cons
Gives learners a sense of control and ownership over their education. Students can discover their interests during their teaching-learning journey.	Advisors and professors may have trouble understanding learners' vision and guiding them. Students may be confused about choosing subjects.
Provides a rounded, broad education. Students get to pick & choose their subjects, courses and programs from different institutes/departments. They can create an academic plan that best suits his/her educational and career goals.	Learners will not be able to gather special skills or in-depth knowledge in any one area. Knowledge of everything but not master of anything.
Lots of opportunities for exciting new research and development. Making conceptual connections between otherwise unrelated disciplines.	It may not be easy to get different departments to work together.
Provides skills that can be valuable in many fields (communications, critical thinking, literacy, math).	Employers and others may not have a clear understanding of what learners have studied in college.
Access to professors and experts in multiple fields.	Difficulty in transfer all of learners' credits if they change their majors.
Freedom and flexibility to study what they are passionate about. Students can crave their own path & prepare for their career.	Learners themselves may not be clear about their studies & career. Variety of subjects may make students feel lost.
Allows them to by-pass classes that are unnecessary or irrelevant.	Different departments/ disciplines may not be available under one roof.

Inter/ Multi-Disciplinary Studies at University Level

At the university level following 3 types of interdisciplinary degrees can be provided on the line of US and UK universities.

- Bachelor's in Interdisciplinary Studies [General Studies programe]
- Bachelor's in Liberal Arts
- M.A. in Multidisciplinary Studies program [Social and Behavioral science]

In General Studies programs, the goal is to obtain a well-rounded, diversified education that promotes life-long learning. It can give learners opportunities to develop vital skills that can help them transition into a variety of occupations, or pursue further education. It can give them the opportunity to explore a variety of subjects without having to focus on their relationships to one another.

A Liberal Arts degree is also interdisciplinary and can give learners opportunities to explore multiple subjects. Rather than having a single area of expertise, it can develop a more varied perspective. They may learn to apply critical thinking skills and bring together concepts from a wide array of subjects.

A Master of Arts in Inter/Multidisciplinary Studies and Research allows students to design a custom plan of study that brings together coursework from the social and behavioral sciences. Students choose courses from psychology, sociology, criminology and criminal justice, and anthropology, to create a degree that imparts the knowledge and skills needed to pursue career options in various industries.

The skills often gained through this degree program can be helpful in fast-paced industries in which students need to continually learn and process new information. The understanding of different perspectives and world views can also benefit in education, business, social work or human resources etc.

Rather than choosing entire majors, a learner may pick and choose relevant courses from a variety of departments. Here's an example of a typical course of study (Table-4).

An interdisciplinary Studies degree will require learners to design their own academic program, communicate with faculty, and advocate for themselves. It's a unique path, so one has to review the pros and cons. Choosing Interdisciplinary Studies can help them put education back in their hands and empower them to create the very best education for their future (Figure-3).

Multidisciplinary research takes place when faculty from different disciplines work independently on a common problem or research question. In this approach, faculty share research

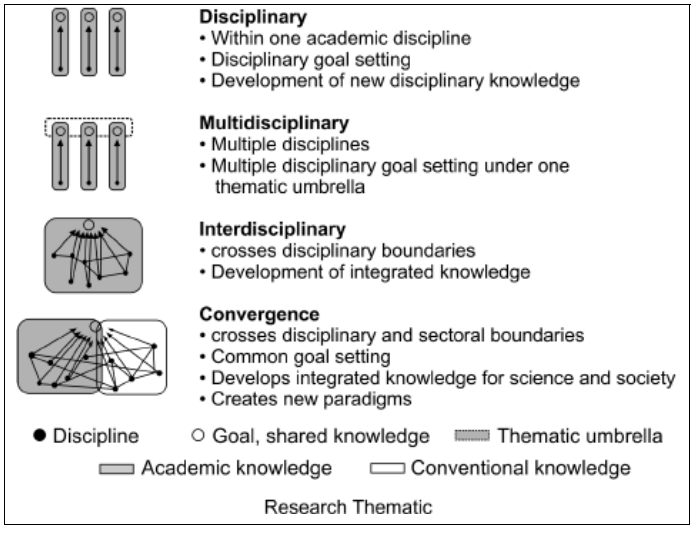
Table-4: Course Model

Program Focus	Possible integration from…
Criminal laws and justice	Sociology, Migration & settlements, Government policies and programmers
Hinduism	Philosophy, Anthropology, Religious literature, Heritage temples & monuments.
Buddhist Studies	Asian Studies, Anthropology
Church Administration	Communication, Humanities, English
Community Organization	Sociology, Psychology, Communication, Local Admini-stration, Self- help groups.
Cyber-crimes & security	Criminal Justice, Information Systems, computer science, Behavioral science.
Conservation	Communication, Biology, Geography, Health and Sport Sciences, SDGs
Education	Psychology, History, Gender Studies
Accountancy	Governance, Law, Politics
Forensic Science	Forensic Anthropology, Criminal Justice Laws, Audits & Accountabilities, Reporting
Healthcare Relations	Math, Communication, Chemistry, Biology
Industrial Design	Art, Physics, Engineering, Humanities, Geometry
Journalism & Media studies	English, communication, Politics, digital studios & broadcasting, Community Service,
Law & Advocacy	Communication, Political Science, Psychology, Social Justice
Medicine & Private Practice	Biology, Chemistry, Physics, Hospital admini-stration, Clinical Lab Science
Mathematics	Physics, Computer Science, Music.
Music Industry	Communication, Classical dancing, Music, Business, Event management.
Non-Profit Fundraising & Grant Writing	Communication, English, Psychology, Socio-logy, Eco-nomics, Advocacy & persuasions
Economics	Political Science, Sociology, Psychology.
Speech & Langu. Pathology	English, Communicative Disorders, Sociology
Urban Planning & National Security	Political Science, Linguistics, Anthropology, Geography
Web Writing & Devp.	English, Business, Communication, Graphic designs.
Women & Minority Issues	Gender Studies, Sociology, Education, History.

goals and work on the same problem, but look at it from their own discipline's perspective. The findings from each discipline are supplementary to each other. The advantage of multidisciplinary research is that each aspect can be analyzed by a particular specialty, which is often necessary to answer complex research problems. There are times when research needs things to go a step further than multiple disciplines each looking at a problem through their own lens – *that is when interdisciplinary research happens*.

American Research Institute defines interdisciplinary research as, "a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice." *In other words, rather than working independently, with interdisciplinary research disciplines interact and work collaboratively*.

Fig-3: Interdisciplinary/ Multidisciplinary at Research Level



Interdisciplinary research relies on shared knowledge. When this happens, a fundamental shift can take place over time and a new interdisciplinary field emerges. For example, biochemistry, nanoscience, and neuroscience all emerged as interdisciplinary fields *that eventually grew to become their own disciplines.*

Convergence research, facilitates Transdisciplinary Integration of Life Sciences, Physical Sciences, and Engineering and Beyond. Convergence research is explained as "a comprehensive synthetic framework for tackling scientific and societal challenges that exist at the interfaces of multiple fields. By merging these diverse areas of expertise in a network of partnerships, *convergence stimulates innovation from basic science discovery to translational application."*

Convergence approach to research integrates insights and approaches from what have historically been distinct scientific and technological disciplines. At its core, two things are necessary in convergence research: 1) It must be deeply collaborative, involving a deep integration of disciplines; and 2) It results in a positive societal

These are, of course, just examples.

Another Grouping

Field of knowledge	Possible Integrations
Communication Science	To take up theories, models, concepts, etc. of other inde-pendent disciplines such as sociology, political science and economics and thus decisively develops them.
Environmental science/ Earth Sciences	To be combined with a wide range of scientific disciplines including geology, chemistry, physics, ecology, and oceanography. And also, environmental laws & justice, sustainability goals.
Knowledge Management	You can build on works in computer science, information systems, Education, economics, human resource management, organizational behavior, philosophy, psychology, and strategic management.
Materials Science	This field can be combined with the scientific and engineering aspects of materials, particularly solids. It covers the design, discovery, and application of new materials by incorporating elements of physics, chemistry, and engineering. Environmental protection and responsible & sustainable use of natural resources also go with it.
Provenance Research: (Beginning of something)	It connects you to Natural and ancient history, Human connections with art, Museum management, Various forms of arts, design and music, Anthropology and Religion studies.
Sports Science	Gels with physical education, Ethics, Life goals, biology and medicines.
Transport Sciences	To be combined with Travel & Tourism, Fuels and ecological effects, Globalization, legal- psychological-management, and technical aspects of transportation.
Peace studies	Goes with History of wars, Conflicts resolutions, Politics, International relations, Balance of power, Military research, Psychology and Sociology, Exploitation of humans and natural resources, cultural anthropology, behavioral science.
Medical science	Goes with Biology, Chemistry, Bio-chemistry, virology science, physics, Environment, Social infrastructure, health & hygiene, water resources, infectious diseases, data science, statistics, Poverty-Hunger-Health.
Animal studies	To be combined with veterinary science, wildlife studies & Protection, Studies of endangered species, Environmental studies, and Marine Science.

impact. Recent development of COVID-19 vaccines in UK at Cambridge university- Astra-Zeneca or in USA Moderna-Pfizer are the best examples of convergence research.

With small but distinct differences, it may be helpful to think of these three approaches to research as stepping stones that build upon one another. Multidisciplinary research is the building block of both interdisciplinary and convergence research. Likewise, interdisciplinary research has led to convergence research, which goes beyond the integration of disciplines to bring together disciplines that have not historically worked together and adding the component of societal impact. As research approaches evolve, it is likely that in another decade it will be said that convergence research is a stepping stone to the next approach being pursued by researchers

To Sum Up

Since 1998, there has been an ascendancy in the value of interdisciplinary research and teaching and a growth in the number of bachelor's degrees awarded at U.S. universities classified as multi- or interdisciplinary studies. The number of interdisciplinary bachelor's degrees awarded annually rose from 7,000 in 1973 to 30,000 in 2005. Industry and government have advocated for interdisciplinary rather than disciplinary approaches to problem-solving in the 21st century. Various funds have advocated that grant proposals be framed more as interdisciplinary collaborative projects than single-researcher, single-discipline ones.

Thus, to some interdisciplinarity is seen as a remedy to the harmful effects of excessive specialization and isolation in information silos. They see the need to transcend disciplines, viewing excessive specialization as problematic both epistemologically (theory of knowledge and limitation of human knowledge) and politically. To others, however, interdisciplinarity is entirely indebted to those who specialize in one field of study—that is, without specialists, interdisciplinarians would have no information and no leading experts to consult.

When interdisciplinary collaboration or research results in new solutions to problems, much information is given back to the various disciplines involved. Therefore, both disciplinarians and interdisciplinarity' be seen in complementary relation to one another.

Conclusion

- Our world is changing at a rapid pace, labeled by some as the VUCA world; volatile, uncertain, complex, and ambiguous. This VUCA world is one where fresh opportunity abounds for those able to rise to challenges as creative and collaborative problem-solvers, thriving on connectedness, optimism, and lateral thinking. In such a world-learners to thrive, they need to have a clear perspective of themselves. Positive community culture, proactive culture, and developing a cohesive strategy around personal and professional growth are pre-requisite in 'New-Learning Paradigms.'
- The key is offering the learners to create, curate, and present their own learning in a way that is unique to them.
- That is what we need in Modern Curriculum with its types and facets as described.

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Ethics: An Integral Element of Transformative Curriculum for a Holistic and Multidisciplinary Higher Education

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Today's higher education across the globe can celebrate its great achievements in terms of content and technology integration. All across the globe universities are adding rich content to their courses, upgrading their content, and integrating technology to a great extent thereby enabling students to learn from anywhere, anytime, and to connect with their teachers regularly. The experience of education today has become more pleasant and student-friendly with institutions investing heavily on physical infrastructure and student care. Customer is king, is also emphasized by higher education institutions, making the learners feel more important and comfortable in the institutions. Higher education institutions are preparing students for the careers they choose to enter by giving them all possible knowledge, skills, and attitude that would favor them. Unfortunately, higher education is lacking today in one specific strength in the students i.e. ethics in their daily life. Transformative curriculum integrated with ethics gives hope for holistic and multidisciplinary education – education in its true sense.

Literature Review

Literature on transformative education is found enough in connection with schools. Transformative education is always linked in the literature to sustainability and virtues. The related literature in very limited scope is presented here:

Adams (2019) in his study titled 'The Far-Reaching Impact of Transformative Curriculum: A Narrative Critical Ethnographic Case Study' found through observations, interviews, and focus groups, that the curriculum transformed learners to believe more in their dignity and worth, achieve academic excellence, and the commitment to advocacy. Luitel (2018) Explored ways to develop a transformative curriculum vision for mathematics education that is inclusive of opposing perspectives and ideologies. In this mindful inquiry, he explored "mindless" views embedded in the mathematics curriculum of Nepal; explored narrowly conceived disempowering assumptions within it; engaged in dialectical interactional texturing among perspectives; and eventually emerged with its transformative potentiality. Clifford and Montgomery (2014) found that transformative learning as requiring fundamental changes in the personal and social perspectives of both students and staff and also requires participation and change at all levels of tertiary education institutions

Diem & Carpenter (2012) suggested the development of a transformative curriculum for leadership preparation programs. Aboytes & Barth (2020) investigated how transformative learning has been conceptualized and operationalized in education for sustainable development (ESD) and sustainability learning and to collect evidence on how to support transformative learning in formal and non-formal environments. The study found the convergence between transformative learning and sustainability has become an emerging field of inquiry, despite the superficial use of transformative learning theory in many studies. It established the fact that if carefully studied, such studies can contribute to the design and implementation of educational interventions and assessments of learning toward sustainability. Pasa & Kharel (2020) examined the importance of transformative education in the Nepalese context. The study concluded that transformative education has been becoming the international agenda for sustainable development. The study discussed the problem of passive teachers who failed to raise a sense of civic virtues in students and students who failed to imbibe the values required for a just and fair society. The study suggested that it is better to apply the contextual model for transformative education by the University teachers highlighted in this paper. Adesina (2020) introduced a new concept termed virtue and ethical stewardship (VES) and explored the pragmatic dimension of transformative learning (TL) in terms of VES. It is defined as developing the character of doing well when discharging responsibility. VES transformative learning draws on historical and contemporary theoretical meanings of TL, virtue ethics, leadership, and stewardship.

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The research adds to the understanding of TL in four significant ways. First, it draws on theories and research to offer practical ways for a university's business leadership programmes to embed VES transformative learning. Second, the VES framework developed shows elements (motive, belief, and intention) of people's identity that could change behavior. Third, the narrative research method enables the inclusion of practical experiences and perspectives of four stewards to develop and name conditions for the VES transformative learning process. Fourth, bridging the gap between the theory and practice of VES: evaluated an MBA module to exemplify the application of the VES transformative learning framework, and involved nine educators in business leadership programmes to critique the validity and usefulness of the framework

Ethics

Ethics as we are aware is an integral part of human life. Ethics enables societies to survive and thrive. Communities and nations that have been well recognized across the globe are those that paid prime attention to training their young children and young adults on the path of ethics. Britannica defines ethics, also called moral philosophy, as the discipline concerned with what is morally good and bad and morally right and wrong. The term is also applied to any system or theory of moral values or principles. Thus, ethics as a discipline enables individuals to understand right and wrong. As a verb, it refers to those activities we involve in and can distinctly segregate as good or bad. Ethics, as a branch of philosophy and as a verb, reiterates the importance of practicing universal moral principles. Ethics is said to impact generations for the goodness of the communities where they are practiced in. Ethics are universal in nature and does not change according to geography, culture, time frame, etc. According to Fernando, Muraleedharan, and Satheesh (2019) the basic principles of personal ethics are concern and respect for the autonomy of others, honesty and the willingness to comply with the law of the land, fairness, and ability not to take undue advantage of others, benevolence and preventing harm to any creature. The principles of professional ethics according to them are impartiality/objectivity, openness/full disclosure, confidentiality/trust, due diligence/duty of care, fidelity to professional responsibilities and avoiding potential or apparent conflict of interests.

Transformative Curriculum

The transformative curriculum is the curriculum that transforms the learners to be people of noble character, who in turn will build noble societies and noble nations. India as a nation was transformed into a modern nation with the introduction of English education for all – men and women, all castes and communities prior to the independence of India. Some of the social evils such as untouchability, sati, and denying education to women and other specific communities, etc. were erased with an education that focused on equity, honesty, fairness, dignity, and respect for all, etc. Today, India is a socially transformed nation, with a highly respected intelligent workforce across the globe. Yet, India has not reached the status of a noble nation – poverty, hunger, illiteracy, gender inequality, domestic violence, unemployment, etc. are all part of the nation. If India has to reach the destination of being a noble nation, ethics need to be an integral part of higher education. Whether the higher education stream is Arts, Science, Engineering, Medicine, etc. every course must have a content of ethics.

Ethics as an Integral Part of the Curriculum

Ethics as part of every course/subject can be focused on two aspects: ensuring ethics in the domain and resolving ethical issues/dilemmas in the domain. To give an example from the domain of Management, ethics can be part of every course like Marketing, Finance, Human Resources, Operations, etc. In each of these specialization areas, there are different subjects that are taught in Finance, we have Banking and Financial Services, International Finance, Security Analysis Portfolio Management, etc. In each of these courses, ethics can be integrated as to what makes the financial practices ethical and what ethical dilemmas/issues must be handled how. To extend the example Banking and Financial Services can be made highly ethical practices by integrating personal and professional ethics into the different roles and functions of Banking and Financial Services. Further, ethical dilemmas/issues like getting involved in money laundering, extending loans to people of financial incredibility, etc. must be taught using the frameworks available such as: SOLVE IT. SOLVE IT refers to the Statement of the problem, Origin of the Problem, List of alternatives, Verification of the alternatives, Evaluation of alternatives, Implementation of the alternative, and testing the alternative.

Stakeholder Model and Social Contract Theory

Stakeholder Theory states that all decisions must be made considering the stakeholders of the decision involved. Stakeholders are people who have an impact on the decision. Most of the time people are influenced by the most powerful among the stakeholders. Students are not aware of all the stakeholders in most circumstances. Higher education must provide opportunities for students to identify all stakeholders – both internal and external, under various decision-making situations. The opportunities for such identification must be an integral part of every higher education course/ subject. Identification of stakeholders will help the students to understand the extent of the impact each decision they make on the stakeholders. It is important that all stakeholders have equal or nearly equal benefits from the decisions made. The teleological approach to ethics suggests that the consequences of decisions must decide the ethicality of the decisions. Thus, all stakeholders must have equal or nearly equal benefits out of the decisions. Higher education must consciously train and orient students toward this end. The highest benefit for all concerned must be the motive of any decision.

Social Contract Theory suggests that there is an invisible and implicit contract between society and every entity in the society, which demands that individuals to do good to society. The Social Contract Theory must be an integral part of the course of every domain, as a gentle reminder to inspire students to do good to society in every initiative they take. The Social Contract though unwritten is binding on the individuals of the society. Students must be given opportunities to establish how they are driving initiatives for the benefit of society. Each course can be seen as an opportunity to build a conscience for Social contracts. To give an example, most Business Schools have as part of the curriculum a social immersion program – where students work in the community for the benefit of the community through an NGO. This is a very limited impact-creating aspect of Business Schools. This can be replicated by other domains where students will continuously use their domain knowledge for the benefit of society and their graduation will depend on the significant contribution they made to society.

United Nations Sustainable Development Goals (UN SDGs)

UN SDGs are having the target year of 2030. UN SDGs are believed to transform nations into noble nations and developed nations. UN SDGs cannot be achieved by themselves and the expected transformation cannot happen spontaneously. It needs the involvement of all concerned. Though government and corporations are working their way to achieving the UN SDGs, contributions from every citizen matter. Higher education institutions can be great contributors to the transformation of nations, by designing curriculums that will involve the students and faculty members in the achievement of the UN SDGs. India with its 1070 universities in 2022 and total enrolment in higher education in 2019-20 stood at 38.5 million with 19.6 million male and 18.9 million female students can get deeply involved in the transformation of India with a transformative curriculum. The 17 UN SDGs relate to the different domains of knowledge taught by universities and can definitely engage the students and faculty members through the transformative curriculum. The transformative curriculum must be designed carefully to get the students consciously and actively involving themselves with the UN SDG achievement of their local communities, cities, taluks, etc.

Students and faculty members engaging with UN SDGs achievement for communities will get them launched into both the theories of ethics – Stakeholder Theory and Social Contract Theory. If students involve in ensuring that UN SDGs are achieved in their local communities they are naturally becoming stakeholder conscious and fulfilling their contract with the society they belong to. By engaging with the achievement of UN SDGs they are also fulfilling the Teleological approach to ethics – a maximum benefit for the maximum members of the society. The transformative curriculum is expected to have a far-reaching impact on individuals and societies. For students, a transformative curriculum will be enriching emotionally, socially, physically, and spiritually. For the individuals in the community, the bonding with academic institutions will grow and will make them more grateful and responsible. For educational institutions and universities, the benefits are beyond imagination – character building of students, nurturing responsible citizens, knowledge repository of the institution, skill set development of

the university, the reputation of the university, etc. will see a remarkable change.

Further, the transformative curriculum integrating ethics through the engagement with UN SDGs will make the curriculum holistic. It will be no more rote learning or peripheral learning for students. They will get exposed to the different aspects of the problems or social issues they face and they will become knowledgeable in multi-disciplinary areas. They will have opportunities to interact with students and faculty of other domains and will grasp wider knowledge and skill sets. They will get better exposure and hands-on experience in dealing with problems in society. This will strengthen the creativity, problem-solving, and critical thinking abilities of the students who become well-rounded and well-nurtured personalities. Introducing ethics through engagement in UN SDGs achievement projects and initiatives in the curriculum – developing the transformative curriculum will bring about the dual or rather multifold, multipronged benefit of equipping our youth with holistic learning and multidisciplinary outlook. India's youth population will definitely be its demographic dividend. Apart from the youth benefitted through the transformative curriculum, the society and the nation will enormously be benefitted and be a totally transformed and developed nation.

Conclusion

Higher Education in India must bring the expected outcomes of it. Higher education in India of late has been superficial and baseless. The real benefits of higher education in India are not visible in the nation. Today, higher education is seen by students as a stop-gap for fun and entertainment, as depicted by media most of the time. Students and faculty members of higher education institutions are not seriously engaged in knowledge-gathering, skill development, etc. Rather higher education institutions are most times places where students and faculty spend time without greater purposes. A minority of the higher education institutions are purpose-driven – to achieve high-paying jobs and to migrate to developed and noble nations. Introducing a transformative curriculum in Indian universities will transform the outlook of the students and faculty members toward education. A transformative curriculum with ethics as its integral part will be an eye-opener for students to see their potential and their commitment to society. Being trained and nurtured to look at life with a Teleological approach – greater good for a larger number of people will drive students to be conscious of all their stakeholders and to get deeply involved in society to fulfill their social contract. Ethics integrated Transformative curriculum focused on UN SDGs achievement through higher education institutions, no doubt will transform India into a noble and developed nation.

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Paradigm Shift of Academy-Industry-Society Interface

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Higher Education Institutions are apostles of knowledge and knowledge systems wherein new knowledge is generated and propagated, and traditional knowledge is preserved and disseminated. This basic aim and function of education have remained the same across the world for as many ages as a human being can imagine. Despite this, the functions and focus of Higher Education have seen a tremendous change. The biggest change is a paradigm shift from 'Knowledge for the sake of knowledge' to 'knowledge for the sake of living'. This shift gave birth to the present system of imparting education and curricular structures that saw a shift from a content-based syllabus approach to an outcome-based product approach. The progressivist views on curriculum and curriculum development focussed on the learning outcomes that were required to develop an educated society with the requisite skills to perform the functions needed to be a bread earner on one hand and a dignified member of the society on the other hand.

This relationship between the knowledge seeker and the knowledge developer developed an education system that is heavily dependent on the vision and aspirations of making a developed nation on one hand and equipping every individual with society-appropriate skills on the other hand. Since an educational institution is a representative of society and industry functions as one of the important stakeholders of these institutions, a resilient collaboration between the two is imperative to realize the dreams of becoming a developed nation.

NEP–2020 and Industry-Academia Relationship

NEP 2020 has strongly recommended the need for enhanced linkages between the industry and academia. Para 11.5 of NEP, 2020 recommends that higher education of all levels and all disciplines should be taught in large multidisciplinary universities while providing rigorous research-based specialization, and opportunities for multidisciplinary work, including in academia, government, and industry.

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In Para 11.8 of NEP –2020, it mentioned that to attain such a holistic and multidisciplinary education, flexible and innovative curricula, and credit-based courses with projects in the areas of community engagement and service, environmental education, and value-based education should be included. As part of holistic education, students at all HEIs will be provided with opportunities for internships with local industries, businesses, artists, crafts persons, etc., as well as research internships with faculty and researchers at their own or other HEIs/research institutions, so that students may actively engage with the practical side of their learning and, as a by-product which further improves their employability. Para 11.12 of NEP, 2020 states that the HEIs will focus on research and innovation by setting up start-up incubation centres; technology development centres; centres in frontier areas of research; greater industry-academic linkages; and interdisciplinary research including humanities and social sciences research. Thus, NEP 2020 directive for HEI envisions an industry-academia linkage that will coproduce research and knowledge that will pave the path of a new India and will enrich both HEIs and industries in terms of research & publications, patents & IPRs, and economical and social modalities.

Industry-Academia Relationship: Opportunities & Challenges

In reference to the education and university system, any stakeholder which may impact the decisions related to curriculum development and design and is in turn impacted by the product of the curriculum i.e. the student either economically, professionally, socially, etc. comprises the industry. The type of industry may vary extensively depending on the courses that institutions offer. Academia refers to the curricular, co-curricular, and extra-curricular components of various programs that the learners study during the given tenure in order to acquire the knowledge and skills requisite for benefitting, themselves, society, and the industry. The Industry-Academia relationship is a mutual collaboration between the industry-academia, which functions either symbiotically or as a complementary association. The basic objective of this relationship is

to ensure that academia develops a knowledge base that can be used by the industry and that the industry absorbs the workforce nurtured by academia.

The industry-academia relationship goes beyond this basic objective and can be catalytic to innovation and growth. While industry often focuses on addressing solutions that are of near-term commercial value and academia focuses on building new knowledge through research and imparting education to students, the combination can yield accelerated development of new breakthroughs. The industry conducts around two-thirds of R&D in science and technology studies, University conducts 20% of R&D work, while 10% is carried out by the government (OECD, 2017).

The industry can be benefitted from the acquisition of new knowledge at an affordable price, a Proficient human resource that is equipped with the latest skills in emerging areas, and access to the best research and development facility. Industry can influence the knowledge base from universities to remain competitive and may source early-stage innovation support.

Universities can have access to the financial resources of the industry for their research activities, the opportunity to identify and work on areas and problems relevant to industrial problems, better ability to develop industry-ready skilled human resources, good internship and employment opportunities for their students, and progressive course curriculum developed with industry inputs.

Some of the major challenges impacting the industry-academia linkage are – the engagement of academia in quality internships/apprenticeships by the industry, lack of contribution of the industrial sector in the futuristic envisioning of the skill set that may be required by them to meet the growing research and development needs, appropriate frameworks for generating industry-relevant knowledge and research and development support. There is a need of providing a supportive environment and an appropriate incentive structure that may promote mutually inclusive collaborations to catalyze enhanced support for industry-oriented research on the one hand and knowledge & skill-focused programme on the other hand.

The focus of an academician is teaching-learning process and an appropriate number of publications for an academician to ensure progression in their career. Further, the focus of universities towards establishing start-up and incubation centres has raised awareness towards patents and their financial implications. There is a need to develop modalities for recognizing industry-oriented research and reports as academic outputs for the evaluation of faculty and equally beneficial revenue-sharing models for the patents and IPRs developed.

Recommendation for Enhancing Industry-Academia Linkages

The Working Group constituted by UGC on, 'Enabling and Enhancing University and Industry Linkages' presented its report in 2019. It recommends several measures to stimulate industry-academia linkage. Some of them are-

1. **Promote multilayers policy interventions to facilitate University-Industry Synergy**, by establishing committees, Technology-Innovation and Entrepreneurship Cells, Policies like Intellectual Property and Technology Transfer Policy, funds like University-Industry Facilitation Fund, Research, and Development (R &D) funds and Intellectual Property (IP) Fund at UGC.
2. **Entrepreneurial Eco-system to encourage students**, academic researchers, and faculty to orient themselves and gradually acknowledge a culture of entrepreneurship needs to be developed, by establishing Incubation Centres, Entrepreneurship Cells, and Technology Research Parks.
3. **Industrial Reorientation of University Programmes, Curricula**, and introduction of dedicated courses on Entrepreneurship, Intellectual Property Rights (IPR), and Technology Commercialisation can promote engagement of industry in process of curriculum design. Through jointly funded PhD and PG Research programs, students can work on industry-oriented problems.
4. **University-Industry Connect** can help bridge the gap between the two. A robust industry-specific R&D scheme and policies can ensure the continuous production of new research and constant inflow of investment through R&D centres and innovation support centres. The organisation of collaborative symposia, conferences etc. is a good approach to knowledge and technology exchange.

5. **Reforming the Promotion Criterion** by giving due weightage to work done towards industry-academia linkages, translational research and publications can motivate the faculty for working towards university-industry linkages.

Present Status of Industry-Academia-Society Associations

Many recommendations of this working group are in practice now. Many Higher Education Institutions (HEIs) have opened University incubation centres, start-up and innovation centres, R&D Collaborations etc. Due weightage is given to the consultancy work and patents filed by the faculty. Despite all these efforts still, there is a long way to go. Several industry-academia linkages are flourishing but they are still limited to select elite institutions, particularly in the field of science and technology. The incubation centres and start-up cells functioning in various institutions need a boost if we want to enhance the expected output. The number of collaborations and MoUs is increasing at a fast pace primarily due to the inclusion of such criteria in NIRF, NAAC and other International Ranking Frameworks. The not-so-industry-friendly curriculum in India is often blamed for creating a skill gap between theory and practical knowledge. This spurt in several Industry-Academia-Society Associations has created a radical change with far-reaching implications for society. Some of the indicators of this shift are reflected in an increase in the number of collaborations & MoUs, the Establishment of innovation and start-up cells, the introduction of a Professor of Practice, and Joint efforts for R & D.

Collaborations and MoU with National Higher Education Institutions

Currently, due to the promotion from the government and schemes and grants from UGC most of the Universities have established SSIP Cell and incubation centres. These centres are functional but still, there is a long way to go if we really want to achieve the target of the expected number of patents, innovations, and start-ups. Many prestigious HEIs have joined hands with international majors. Some of the examples include: the Indian Institute of Science (IISc), Bengaluru has a tie-up with IT company Wipro for research and development in emerging technologies like artificial intelligence, IoT, machine learning, visual computing etc. IIT Kharagpur signed an MoU with Wipro for industry focussed applied research in 5G and Artificial Intelligence. IIT Guwahati has housed a digital academy for Samsung, India to train people in emerging technologies. Samsung has established innovation centres at IIT Hyderabad, IIT Kanpur, IIT Delhi, IITE Kharagpur and IIT Roorkee. IIT Kanpur has signed an MoU with Mahindra Group for joint research in the domain of cybersecurity. This list is increasing and many more institutions are coming forward for such collaborations.

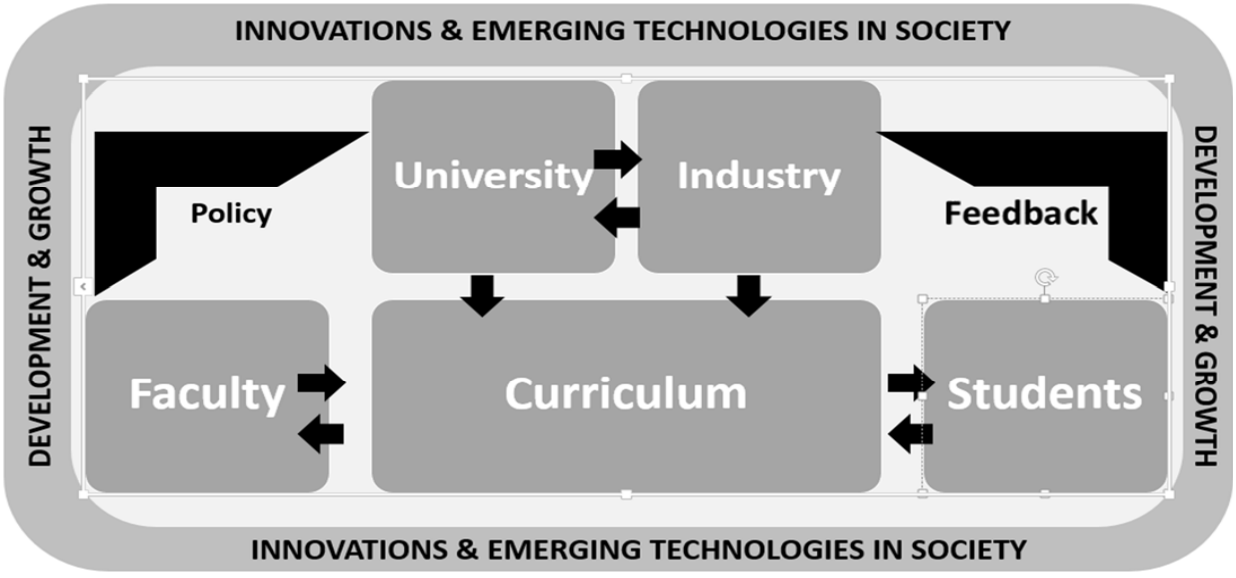
The MoUs between industry and academia are more popular between the tech giant and the National Institutes of Importance. Many HEIs have now started taking interest in these linkages probably due to larger stakes involved in NAAC Accreditation and NIRF Ranking. There is a larger need to go beyond this ranking framework and develop linkages that not only benefit industry-academia but also promote the development and growth of society. This can only be done by providing a boost to innovations and advances that resolve the immediate issues and problems faced by society at large.

Industry-Academia Collaboration in Curriculum Development & Curriculum Transaction

The Industry-Academia linkages are now not limited to only MoUs and collaborations but some real hard-core linkages are developed to strengthen the bond and take it to newer heights. The role of industry in curriculum design, development, and the transaction is increasing. Involvement of Industry in curriculum development can help HEIs to develop society and industry-ready outcome-based curricula. The involvement of industry and university in curriculum design and development is shown in figure 1.

Thus, as shown in Fig. 1 Industry and University linkage can help develop curriculum and initiate some policy changes. The industry-ready curriculum will initiate dialogue between industry and faculty. This interaction will initiate the exchange of knowledge and emerging technologies between the two. It will also help in the introduction of new concepts and technologies in the curriculum. Universities can devise multiple ways through which inputs can be received from the industry. The most important would be the introduction of industry

Fig. 1: Industry-Academia-Society Linkage in Curriculum Development



representatives in the Board of Studies (BoS), Academic Council (AC) and other academic bodies of the university. As the BoS and AC members the Industry representatives can suggest course content that is evolving due to emerging technologies in various industries. The content can be developed with the help of industry experts. Even industries can also function as the platform for providing apprenticeships, internships or training to students. They can also facilitate the provision of laboratories for the conduct of experiments if the same is difficult or costly to arrange in the HEI. Further, the technical staff of the industry can train the faculty of HEI who can then play the role of master trainer and train other faculties. The 'Train the Trainer' structure can be used for multiple purposes like technological know-how, content knowledge, devising appropriate teaching techniques etc. Workshops, seminars and conferences can be organised in joint collaborations of HEI and industry in order to initiate a working chain model between industry-society and academia.

There is a need to enhance the participation of industry in the development of detailed course content during the curriculum development process. Once the course content is developed, Universities and HEIs can plan discussions with industrial partners in presence of all the stakeholders. Stakeholders along with faculty and industry experts can review the content and give their feedback for improving the content. After the feedback process, the approved course content can be included in the course curriculum. The appropriate mechanism can be drawn for the teaching of industry-ready courses in collaboration with the industry.

Points of Concern for the Industry-Academia-Society Associations

There are a number of issues that need to be catered to for the enduring linkages between Industry-Academia-Society Associations. The most important point of concern is the linkage for the sake of linkage should be substituted with the functional linkages capable of producing society-appropriate output. This will give an impetus to the development of industry on one hand and the growth of society on the other. The make in India objective and numbers for Make in India products can deliver success and quality only when the course curriculum is rapidly updated to include the course content appropriate for emerging technology along with content that develops a sense of decision-making for the appropriate use of technology.

The NEP 2020 focuses on rigorous research-based collaborations along with a multidisciplinary approach that needs to be worked out. Universities should devise an appropriate mechanism to allow horizontal and vertical movement of the learner in and out of the industry on one hand and strengthen the research output of faculty on the other hand. There are many opportunities for a such mechanism by

creating innovative curricula. These curricula should provide opportunities for community engagement along with the holistic development of the learner. The credit transfer and credit accumulation policies are giving enough flexibility to the HEIs. They can include credit-based courses, projects, community engagements, industry engagements etc. in such a manner that students can accumulate and earn credits through multiple means. HEIs can certify these credits by assessing the learner on outcome-based assessment and evaluation processes. Finally, HEIs should focus on developing industry-academic linkages and interdisciplinary research in humanities and social sciences. This will help the aesthetic sciences, languages, and arts to come on the forefront along with science and technology

Conclusion

Thus, Industry-Academia-Society linkages have taken giant steps during the last few years. Still, there is a lot of work that needs to be done if we want to compete with International Institutions in ranking and production of revenues in terms of start-up technologies and patents. The developers of NEP 2020 have envisioned a New India with an Education System engrained in its own culture, tradition, science, and technology on one hand and a world-class, innovative, and emerging technology-ready global economy on the other hand. An appropriate strategy and revenue-generating model of Industry-Academia-Society linkages can go a long way in realising these dreams.

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University News

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A Very Happy Republic Day

Outcome-based Education: Calculating Attainment of Programme Outcome through Course Outcome

Sushil Kumar Pare*

Quality of higher education has always been at the center of thinking for all educators, education administrators, and policymakers. In India, policymakers have encouraged higher education institutes to go for accreditations, such as the National Assessment and Accreditation Council (NAAC) or the National Board of Accreditation (NBA). These bodies have a robust and comprehensive framework to judge the quality of the institutes. They ask for data in different formats and on various points, but one thing common in both cases is calculating the Program Outcome (PO) attainment through Course Outcome (CO). This is a standard requirement.

Attainment of PO through CO is an essential and integral part of teaching-learning. All accreditation systems such as NAAC or NBA would like to see it quantified.

The calculation and paperwork should be minimized in academics. Available time, energy & resources should be invested in teaching. Our other argument is about the crystallization of the outcome. Academics are so vast and multifaceted that the outcome will be more abstract. Moreover, framing a 'society-friendly' outcome and achieving it partially is better than framing an 'institute-friendly' outcome and fully achieving the same.

This paper attempts to arrive at a logical, concise, and simple method to calculate the same. The paper does not talk about the quality or comparison of assessment methods. The accreditation agencies need an assessment on a direct basis (marks obtained) and an indirect basis (stakeholder surveys). The paper focuses only on direct assessment.

Outcome-based education and its quantification is a topic of discussion in the management of educational institutes but the outcome for education, especially higher education, cannot be crystallized easily as the outcomes are many and abstract in nature.

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Consider the case of higher education, for instance. Which outcome should be chosen? Is it making excellent engineers or engineers who are ethical in their thinking, approach, and work, even if their skills may be a little poor? Making good managers for large MNCs or making entrepreneurs? Making entrepreneurs or making social entrepreneurs? Making leaders for societal change or corporate barons? If we make good entrepreneurs, whether we want to groom them only for entrepreneurship or they should be social entrepreneurs as well? What kind of business managers do we want to produce, run of a mill version, or a visionary who would take tough decisions and prepare the company for a turnaround? Doctors, who are excellent with diagnosis or doctors who are less skilled but worried about the community?

The essence is what sort of graduates will the program produce. What competencies will they possess. What basic skills will they have. The dilemma is between developing skills vs developing the mindset to serve society. In case both cannot be achieved within a short span of studies, then what should be the priority? Unfortunately, — in the case of higher education—we use employability as a cover to sweep all the worries (read, real objectives) under the carpet.

There is no single answer to the dilemma and if one can draft the objectives, then operationalization of the construct is a second-order challenge. How does one differentiate between managers and leaders? Or Entrepreneurs and managers, who work for the corporate but run the show as an entrepreneur? The line of demarcation does not exist and if somehow someone is able to define what kind of leaders or entrepreneurs the institute wants to produce then obviously there is a blur.

The third-order challenge is to define the parameters to capture the objectives the institute has set for itself, for each of which quantifiable data is required to ensure that the academic institute can achieve the defined outcome and that there is progress on a yearly basis. As we can see, most such outcomes are continuous in nature. However, the accreditation

agencies would love to see the progress on a year-on-year basis.

The fourth-order challenge is to create a mechanism to calculate the attainment level, as both accreditation agencies do not prescribe any method to calculate the same. Nevertheless, the paper has been prepared to support the academic institutes in India to help in finalizing a simple and concise way to calculate the attainment level keeping NBA and NAAC guidelines in mind.

View of the Accreditation Bodies: The Indian Perspective

Both NAAC and NBA focus on the holistic development of a learner. Students need to be groomed around current business practices, ethics, values, entrepreneurship, and research. The accreditation boards expect the program objective to be comprehensive in nature and cover everything. *Accreditation Manual for Business Schools* (NBA, 2012) clearly talks about the linkage between teaching performance, institute mission, and program objectives.

NBA pushes academic institutes toward the quantification of the outcome in each area whenever it is possible. The manual by NAAC also focuses on a quantitative assessment of attainment in each area, be it teaching, learning or research. The *Institutional Accreditation Manual* (NAAC, 2019) clearly indicates that the method to be used need not be a standard one across the institutes, but each institute should have a well-defined direct method of assessment.

NAAC manual divides the attainment of program outcome (PO) into two parts: direct attainment is through the number of students achieving a certain percentage in a specific course whereas indirect attainment is through a survey of the stakeholders.

The direct method of computing Course outcomes (COs) attainment should be based on the student performance in all assessment instruments such as end-term examinations, viva voce, presentation, etc. Course outcomes (COs) are to be attained by all students at the end of a formal course.

Before an institute embarks upon the journey of calculating attainment, PO has to be defined for each program (MBA/PGDM). In the case of specific graduate programs such as History or Economics, there are specific program objectives (PSOs). For each program, its PSO needs to be drafted and attainment needs to be calculated.

Need for Outcome-based Education

Why do we need outcome-based education (OBE)? There is no obvious answer. The logic behind it ranges from fixing the responsibility of educators in enhancing the quality of education to bringing objectivity to education. There are academicians and scholars who advocate OBE (e.g., Spady, 1994; Zitterkopf, 1994) and there are academicians and scholars who consider the same to be futile (e.g., Ecclestone, 2002; Jonathan, 1997). The issue is so complex that finding a simple answer to the dilemma is nearly impossible. Both sides have their own justifications for their stand.

Outcome-based Education—Definitions and Concept

There have been several attempts to define the outcomes of higher education. Sometimes considered as curriculum and instruction design (Spady, 1988), curriculum delivery and results (Harden, Crosby, & Davis, 1999; Zitterkopf, 1994), or set of procedures (McKeman, 1993). Lawson and Askell-Wiliams (2007) see this as a democracy where there is a scope for different voices. The outcome of education is certainly not a monolithic concept. It encompasses the very basic elements such as curriculum and its delivery as well as the process of delivering the curriculum.

Challenges of Outcome-Based Education

OBE as a concept has been criticized by many scholars. Not because of its intent but because of its limitations. The idea of higher education is to develop the ability and an attitude of thinking in the learners. Thinking is a crucial skill and should be inculcated during education. With a preset outcome, the learning process would surely hinder the main objective of education. McKernan (1993) pointed the same very wisely, "We must value education for its own sake, not because it leads to some outcome." O'Neil (1994) cites the burden of the pedagogical process emerging because of OBE.

The scholar feels that education plays the second fiddle because of the process needed to establish the OBE. As the curriculum is the fulcrum for OBE, Lawson, and Askell-Wiliams (2007) draw our attention to the difference in the understanding

of the student and delivery by the teacher of the same content across various schools.

Challenges of the Method for Outcome-Based Education

Current literature on attainment calculation is dominated by the publication of assessment methods in the engineering stream. The reason may be the Washington Accord for spreading the word. These methods are a little complex and do not serve the purpose of management education, which is more social and less mathematical.

Most of the methods map each and every question for the outcome attainment calculation (Anala, Hemavathy, & Shobha, 2014; Bhimasen & Mahesh, 2016; Zamri, Talib, & Reza, 2010). This leads to a little complex method of calculation, which assigns a weight to each question asked in the examination, as not all topics to be covered are spread evenly across the entire course.

In another approach, calculating the outcome based on one assessment (such as a class test, viva voce, or presentation) is less complicated and is used by many scholars such as Admuthe and Loni (2015) and Rawat and Karkare (2015) in their attainment calculations.

The published literature in this area lacks a comprehensive approach. The major lacuna in the current literature on attainment calculation is that the approach selected is too focused upon calculating the attainment and leaves out the importance of linkage between vision, mission, program objective, and course outcome.

Rubrics are another important missing aspect of assessment calculation. "A rubric is an assessment tool with clear [sic] indication of achievement criteria across all the components" ("Rubrics," 2019; see also Peter, Noreen, & Press, n.d.). According to NAAC and NBA, direct attainment would depend upon an assessment of the learner. In this case, a clear and concise rubric for an assessment should be developed beforehand. Without rubrics, the assessment is like moving in a dense jungle without a compass.

Another aspect that academicians stress is Bloom's taxonomy. Bloom's taxonomy is a hierarchal approach to pedagogy and starts from remembering the fact to gradually reach the creation of knowledge through understanding, application, analysis, and evaluation capabilities of the student. Theoretically, it is a fantastic idea, but in practice it is difficult. Students are always a mixed bag of capabilities and competencies. If it is not completely impossible, it is at the same time very tough to push all the students through Bloom's hierarchy within 10–12 weeks of academic exposure for each course.

Another challenge with Bloom's taxonomy is that it is too knowledge-centric. What about the necessary life skills? What about the value system? What about the right attitude? It is a fact that most entry-level jobs in the world are skill-based.

Last but the most important task is writing the measurable outcome. This is a crucial aspect pushed by the data-hungry system created by the accreditation bodies. The system always believes that if you cannot count, you cannot control. It is true to some extent but also presents a lot of complexities because in academics the students are diverse in nature in terms of their capabilities and competencies. In this light, how we can find a common base?

The outcomes of higher education are abstract in nature, thus tough to quantify. Moreover, students are a mixed bag of competencies which makes it even tougher to come up with a single criterion to assess the outcome for a specific batch. Hence quantification and assessment of such outcomes are very challenging to carry out, while the accreditation bodies ask for a 'progress card' from the educational institutes on a yearly basis.

Outcome-based Education—Current Evaluation Practices

There is no unanimity pertaining to the process of attainment calculations. Interestingly, the scholars from engineering institutes are more vocal about their institute's practices and write about the method they follow in academic journals. All the methods they follow are diffident in their processes. The nature of social sciences is different from engineering education: engineering stresses direct learning; social sciences focus on building the capability to learn (Kolb, 1976).

Since the premise of attainment calculation is set by the accreditation authorities as a number of students getting certain marks in an assessment, hence we need to re-think the mechanism to calculate the attainment of OBE within the framework. We

need to move from a question-mapping approach to an assessment-mapping approach.

Designing Course Outcome

As per the *Accreditation Manual for Business Schools* (NBA, 2012), while designing an outcome for the program (PGDM/MMS/MBA) 'linkages' are the key. As we know that "Vision Statement" leads to a "Mission Statement." The mission statement should naturally progress into PO and culminate in CO. If the vision of the school is to develop a socially accountable managerial workforce for the industry, the mission should translate the same into a PO with the timeframe as one important parameter. PO would take the inputs from the mission statement and curate the way for course structure in such a way that every course taught adds to achieve the vision statement.

Measuring the Attainment of the Outcome

As discussed earlier there is no single method of calculating the attainment. For NAAC and NBA, the suggested method is through calculating the number of students participating and scoring a particular percentage (e.g., 60%) in a particular assessment. There may be different assessment tools to measure different aspects of the outcome. For instance, a basic understanding of the concept can be assessed through classroom tests while practical exposure can be checked with field projects. Similarly, analytical capabilities can be assessed through the case study method. We propose one simplified method for the same.

The Proposed Process

1. Drafting POs
2. Drafting COs
3. Mapping the relationship between POs and COs
4. Assigning the values
5. Mapping of assessment tools to COs
6. Assigning weight to different assessment tools
7. Finalizing the level of performance
8. Placing the values as per the class performance
9. Calculating the attainment
10. Converting the attainment numbers into percentage
11. Normalization

Step 1: Drafting Programme Outcomes

PO is simply the reflection of the vision and mission achieved through the delivery of and passing of the students in a program. In India, employability is a major concern for most of the B-schools and hence in most cases, the POs are drafted to achieve student employability. The sample PO given here is suggested by the accreditation bodies and addresses the same issue.

Sample POs

- PO_1 *Apply knowledge of management theories and practices to solve business problems.*
- PO_2 *Foster analytical and critical thinking abilities for data-based decision making.*
- PO_3 *Develop value-based leadership ability*
- PO_4 *Develop the ability to understand, analyze and communicate global, economic, legal, and ethical aspects of the business*
- PO_5 *Develop the ability to lead themselves and others in achieving organizational goals, contributing effectively to a team environment*

Step 2: Drafting Course Outcomes

As PO is for the complete programme such as MBA/PGDM/MMS etc., CO is drafted for specific courses such as Rural Marketing, Marketing Management, or Financial Accounting. COs should be drafted in such a way that they are achievable, and measurable, have a linkage to POs, and enhances the learner's understanding of the subject.

While drafting COs, we need to keep two things in mind. First, the concept of Bloom's taxonomy, that is whether the outcome pushes the learner for the first order (remembering the information) or the final order (creation of knowledge). Second and the crucial task is to finalize the 'assessment rubrics', which would ensure that all students who get the same marks are at the same level of learning.

Here is a sample of rural marketing course outcomes:

Sample COs: Rural Marketing

- Students are
- CO_1 *Able to explain the nature of the rural economy*
- CO_2 *Able to identify the challenges of rural markets*

- CO_3 *Able to discuss the major reforms by the government in the rural sector*
- CO_4 *Able to apply major marketing concepts to rural marketing situations*

These COs are just indicative and for illustration purposes only. Now we need to map the COs and POs, that is, which CO helps in achieving which PO. There is no limit to the number of COs and POs but as per the example given by NBA, five POs are enough. In the same way, COs can be limited to three to five.

Step 3: Mapping the Relationship Between POs and COs

A sample mapping can be done by a faculty (or subject expert) as in Table 1.

Table 1: Mapping CO to PO

	PO1	PO2	PO3	PO4	PO5
CO1	S	M		M	
CO2	S	S		M	M
CO3	S	S	M	M	L
CO4	S	M		S	M
CO5					

Note: *s = strong relationship; m = moderate relationship; l = low relationship; blank = no relationship*

As we can see in Table 1, the relationship has been defined as strong (S), medium (M) or low (L) by the faculty or the subject expert. If CO1 contributes much to PO1, then there is a strong relationship between the two. Similarly for the other two relationships. In the same way, if a CO does not contribute to any PO, then the corresponding cell is left blank.

Step 4: Assigning the Values

For every status (i.e., strong, medium, or low) the corresponding value has been decided by the accreditation bodies.

Table 2: Value Allocation

	PO1	PO2	PO3	PO4	PO5
CO1	3.00	2.00		2.00	
CO2	3.00	3.00		2.00	2.00
CO3	3.00	3.00	2.00	2.00	1.00
CO4	3.00	2.00		3.00	2.00
CO5					
Average	**3.00**	**2.50**	**2.00**	**2.25**	**1.67**

In Table 2, a strong relationship is given the value 3, medium, 2 and low, 1. For every column (PO), the average is then calculated. Note that the value is placed in a cell where there is a mapping of relationship (s, m, l) in Table 1 otherwise it is left blank.

Step 5: Mapping of Assessment Tools to COs

As we discussed earlier, depending on the Cos, assessment tools have to be finalized and mapped.

Table 3: Mapping Assessment Tools with COs

	Course Outcome (CO)				
Assessment Tools	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Group assignments				*	
Presentation			*	*	
Class test	*	*	*		
Assignment		*	*	*	
End-term exam	*	*	*		

In Table 3, the faculty is supposed to map the assessment tools with objectives. The lower order COs on Bloom's taxonomy such as 'remember' and 'understand' can be assessed with the help of a class test or end-term examination.

The higher-order COs such as 'apply' or 'analyze' can be assessed with the help of presentations or group assignments. The faculty is free to choose any testing mechanism to achieve the objectives. Here, the only important thing is the quality of assessment over the quantity of assessment. A carefully chosen testing mechanism with a predefined assessment rubric would enhance the quality of the assessment.

Step 6: Assigning the Weightage to Various Assessment Tools

Table - 3A: Assigning the Weightage

Assessment Tools	Weightage
Attendance & Participation	0.10
Written Test	0.10
Component 1 / Paper Review	0.10
Component 2 / Field Research	0.10
Semester End Exam	0.60

In table 3A, the weights have been assigned to each assessment tool. The choice of assessment tools lies with the course instructor. In this case, the term-end exam carries 60% weightage.

Step 7: Finalizing the Level of Performance

In Table A, the performance level (high, medium, low) is captured as the number of students (in percent) getting the target marks in various assessments.

Table A: Assign Marks as per the Allocation Mentioned Below

Target (% of students getting 60% or more)	Grade	Marks
50% or fewer	Low	1
More than 50% but less than 65%	Medium	2
65% and above	High	3

Graduation of the result would depend on two factors. First, a desired (target) percentage for all students is set. In our example, we have taken 60% as desired. Second, how many students can achieve the desired percentage. If 50% or fewer students can score 60% in the said subject, then the performance is graded as low.

Setting the assessment benchmark is important while calculating the assessment. The guidelines given by NAAC and NBA suggest choosing a number depending upon the university result. As most of the management programs are autonomous in nature, the benchmark will not work. The guidelines in the manual also suggest taking a number depending on earlier results.

Step 8: Placing the Values as Per Class Performance (Course Outcome Attainment)

In Table 4, values have to be placed following the criterion decided in Table A.

Table 4: Values as per the Result of the Class and Table A

Course Outcome (CO)					
Assessment Tools	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Group Task				3.00	
Presentation			3.00	3.00	
Class Test	2.00	2.00	2.00		
Assignment		3.00	3.00	3.00	
Semester End Exam	3.00	3.00	3.00		
Average	**2.50**	**2.66**	**2.75**	**3.00**	

We need to check the result of the class for every assessment tool. Depending on the number of students (in %) achieving 60% in a particular assessment, the values can be filled in. For example, if 65% or more students score 60% marks in presentation, the value is 3. For every column (CO) the average is then calculated. Note that value is placed in a cell where there is a mapping in Table 3, otherwise the cell is left blank.

Step 9: Calculating the weighted attainment

Table - 4 A (Weighted Attainment)

Course Outcome (CO)					
Assessment Tools	***CO1***	***CO2***	***CO3***	***CO4***	***CO5***
Attendance & Participation	*=Value corresponding to attendance * Weightage Assigned*				
Written Test					
Component 1 / Paper Review					
Component 2 / Field Research					
Semester End Exam					
Sum	***=SUM (M56:M60)***				

Course outcome values as recorded in table 4 are now multiplied with weightage decided in table A. Thus, the course attainment values are adjusted to the weightage assigned to a particular assessment tool.

Step 10: Calculating the Program Outcome Attainment

In Table 5, the formula for the corresponding cells is presented. It is the product of the mean of corresponding COs and POs. The average PO values are from Table 2 whereas the average CO values are from Table 4A.

Table 5: Product of averages of COs and POs

COs	PO1	PO2	PO3	PO4	PO5
CO1	= CO1×PO1	= CO1×PO2	= CO1×PO3	=CO1×PO4	= CO1 × PO5
CO2	= CO2×PO1	= CO2×PO2	= CO2×PO3	=CO2×PO4	= CO2 × PO5
CO3	= CO3×PO1	= CO3×PO2	= CO3×PO3	=CO3×PO4	= CO3 × PO5
CO4	= CO4×PO1	= CO4×PO2	= CO4×PO3	=CO4×PO4	= CO4 × PO5
CO5					

In Table 5B, the data is from Table 2 and Table 4. As CO5 is blank there, it is blank here too.

Table 5B: Product of averages of COs and Pos

COs	PO1	PO2	PO3	PO4	PO5
CO1	2.50 × 3.00 = **7.50**	2.50 × 2.50 = **6.25**	2.50 × 2.00 = **5.00**	2.50 × 2.25 = **5.62**	2.50 × 1.67 = **4.17**
CO2	2.67 × 3.00 = **7.80**	2.67 × 2.50 = **5.65**	2.67 × 2.00 = **4.52**	2.67 × 2.25 = **5.08**	2.67 × 1.67 = **3.77**
CO3	2.75 × 3.00 = **8.25**	2.75 × 2.50 = **6.87**	2.75 × 2.00 = **5.50**	2.75 × 2.25 = **6.87**	2.75 × 1.67 = **4.59**
CO4	3.00 × 3.00 = **9.00**	3.00 × 2.50 = **7.50**	3.00 × 2.00 = **6.00**	3.00 × 2.25 = **6.75**	3.00 × 1.67 = **5.01**
CO5					
Average	**8.19**	**6.82**	**5.46**	**6.14**	**4.55**

This is a simple product of the average of the corresponding POs and COs. The average of both is the "attainment." The calculation is based on two vital elements provided by NAAC and NBA. First, mapping CO to PO. Second, performance of the students in the relevant assessment tool.

Step 11: Converting into percentage

Attainment (%)	0.91	0.76	0.61	0.68	0.51

PO can attain the maximum value 3 and CO also can attain the maximum value 3. Hence the maximum value their product can attain is 9. That is the reason the average in Table 5B is divided by 9. This is the attainment of the course of rural marketing in percentage terms.

Step 12: Normalization

Normalization	2.73	2.27	1.82	2.05	1.52

Usually, the attainment is denoted as high, medium or low, that is 3, 2 or 1. Here the final value is multiplied by 3 get the value between 1 to 3. Since the percentage value is always less than one, the normalized value would always be less than 3. It would be easy for the faculty to judge the attainment in qualitative terms (i.e., high, medium or low).

So, the final attainment for subject rural marketing is:

PO1 = 2.73 = High,

PO2 = 2.27 = Medium,

PO3 = 1.82 = Low,

PO4 = 2.05 = Medium and

PO5 = 1.52 = Medium

(Assuming 1 to 1.50 = low; 1.51 to 2.50 = medium; 2.51 and above = high)

In this way, the attainment for the entire program can be calculated as shown in Table 6. Program outcome attainment can be calculated just by taking the mean of all courses.

Table 6: Program Outcome through Course Outcome

Final Course Outcome	PO1	PO2	PO3	PO4	PO5
Rural Mkt.	2.73	2.27	1.82	2.05	1.52
Product Mgt.					
Operations Mgt.					
Labor Legislation					
HRM					
Etc.					
Etc.					
	Avg	**Avg**	**Avg**	**Avg**	**Avg**

Epilogue

Attainment of COs through POs is a little complex. We have tried to suggest one way to calculate the same. The accreditation bodies need both direct and indirect assessment. The paper is limited to only direct assessment.

Any calculation is like a mechanical part; here it is designed to drive the value or objectives. In the same way, the calculation of attainment would be more useful for the learners, educational institutes, and society at large if the design is thoughtful. Carefully crafted vision and mission, and proper linkages of program outcome and course outcome are better, but the best thing is to contemplate what kind of graduates we want to give to society.

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> "Every good education system must give a very good account of the past and its lessons, nurture the minds of the present learners in an innovative and creative way for the best today's life through the good and the bad times, and also lay a solid foundation for the unborn generation."
>
> *— Ernest Agyemang Yeboah*

Outcome-based Education : Moving towards a New Pedagogical Paradigm

Ismail Thamarasseri*

Outcome Based Education (OBE) is an educational approach and a learning philosophy, which envisages organising the entire academic programmes (curriculum) and instructional efforts around clearly defined 'outcomes' that an institution wants all students to demonstrate when they complete the programme. The purpose of the outcome-based approach is to ensure that students achieve learning expectations for the programmes in which they participate. The fundamental premise underlying the learning outcomes-based approach to curriculum planning and development is that higher education qualifications are awarded based on demonstrated achievement of outcomes (expressed in terms of knowledge, understanding, skills, attitudes, and values) and academic standards expected. The expected learning outcomes would be used as reference points to help formulate graduate attributes, qualification descriptors, programme learning outcomes, and course learning outcomes, which will help in curriculum planning and development and the design, delivery, and review of academic programmes. They provide general guidance for articulating the essential learnings associated with programmes.

The OBE is an educational model in which curriculum and pedagogy and assessment are all focused on student learning. OBE is a process that involves assessment and evaluation practices in education to reflect the attainment of expected learning outcomes and show mastery in the programme area. In other words, OBE is an approach that focuses on outcomes, i.e., student achievement that is measurable, proven, and can be improved. OBE is an educational process that is focused on achieving certain specified outcomes in terms of individual student learning. It is a method of curriculum design and teaching that focuses on what students can actually do after they are taught. Through OBE, students are expected to be able to do more challenging tasks other than memorize and reproduce what was taught. Outcomes are key things students should understand and be able to do or the qualities they should develop. If the outcomes are not achieved, they are rethought to ensure there is *continual quality improvement* within the education system. OBE is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience, each student should have achieved the goal. There is no single specified style of teaching or assessment in OBE; instead, classes, opportunities, and assessments should all help students achieve the specified outcomes. The role of the faculty adapts into instructor, trainer, facilitator, and/or mentor based on the outcomes targeted.

Outcome-based methods have been adopted in education systems around the world, at multiple levels. Australia and South Africa adopted OBE policies in the early 1990s but have since been phased out. The United States of America (USA) has had an OBE programme in place since 1994 that has been adapted over the years. In 2005, Hong Kong adopted an outcome-based approach for its universities. Malaysia implemented OBE in all of its public schools systems in 2008. The European Union (EU) has proposed an education shift to focus on outcomes, across the EU. In an international effort to accept OBE, The *Washington Accord* was created in 1989; it is an agreement to accept undergraduate engineering degrees that were obtained using OBE methods. As of 2017, the full signatories of the *Washington Accord* are Australia, Canada, Taiwan, Hong Kong, India, Ireland, Japan, Korea, Malaysia, New Zealand, Russia, Singapore, South Africa, Sri Lanka, Turkey, the United Kingdom, Pakistan, China, and the USA. The *Washington accord* is an agreement between selected governing bodies around the World that provide engineering degree accreditation. It provides assurance that if an engineering degree is awarded by one of its members, the degree is recognized by all other members of the *Washington Accord*. For example, if your degree is accredited by the National Board of Accreditation (India) then it is also recognized by Accreditation Board for Engineering and Technology (USA).

India has become a permanent signatory member of the *Washington Accord* on 13th June

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2014. India has started implementing OBE in higher technical education like diploma and undergraduate programmes. The National Board of Accreditation (NBA), a body for promoting international quality standards for technical education in India started accrediting only the programmes running with OBE in 2013. The NBA mandates establishing a culture of OBE in institutions that offer Engineering, Pharmacy, and Management programmes. Outcomes analysis and using the analytical reports to find gaps and carry out continuous improvement is an essential cultural shift from how the above programs are run when OBE culture is not embraced. Outcomes analysis requires a huge amount of data to be churned and made available at anytime, anywhere. Such access to scalable, accurate, automated, and real-time data analysis is possible only if the institute adopts either an Excel spreadsheet-based measurement system or home-grown or commercial software system.

Outcomes

The emphasis in an OBE system is on measured outcomes rather than "inputs," such as how many hours students spend in class, or what textbooks are provided. Outcomes may include a range of skills and knowledge. Generally, outcomes are expected to be concretely measurable, that is, "Student can run 50 meters in less than one minute" instead of "Student enjoys physical education class." A complete system of outcomes for a subject area normally includes everything from a mere recitation of fact ("Students will name three tragedies written by Shakespeare") to complex analysis and interpretation ("Students will analyse the social context of a Shakespearean tragedy in an essay"). Writing appropriate and measurable outcomes can be very difficult, and the choice of specific outcomes is often a source of local controversies. *(Retrieved from https://www.k12academics.com)*

Each educational agency/institution is responsible for setting its own outcomes. Under the OBE model, education agencies may specify any outcome (skills and knowledge), but not inputs (field trips, arrangement of the school day, teaching styles). First and foremost, OBE is an organizational structure. It is a way to structure content around activities that lead to demonstrable proficiency in a specific skill, knowledge, or behavior. As a learning model, OBE is non-prescriptive. Instead, it offers a handful of principles that are worth considering in more detail:

- *Student-centred:* As a learning model, outcomes-based education starts by asking: what does a learner need to do to demonstrate mastery of a particular skill, knowledge, or behaviour? Such an approach puts student needs front and centre of the learning design process.
- *Clarity:* Given that all learning objectives in an OBE model are clearly spelled out ahead of time, learners know what's expected of them and can adjust their focus and questions more appropriately.
- *Flexibility:* An OBE model must be flexible enough to adjust to a learner's strengths and weaknesses. Flexibility is also important for providing learners enough time to attain fluency or proficiency.

Various Aspects of the OBE

The various aspects of the OBE are enlisted as under:

- **Programme** is defined as the specialization or discipline of a degree. It is the interconnected arrangement of courses, and co-curricular and extracurricular activities to accomplish predetermined objectives leading to the awarding of a degree. For example, M.A. in Education, M.Ed.
- **Course** is defined as a theory, practical, or theory cum practical subject studied in a semester. For Example, Educational Philosophy, Guidance, and Counselling
- **Programme Outcomes (PO)** are narrower statements that describe what students are expected to be able to do by the time of graduation. POs are expected to be aligned closely with Graduate Attributes. POs are defined by the Accreditation Agencies of the country (NBA in India).
- **Course outcomes (CO)** are statements that describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course. Generally, three or more course outcomes may be specified for each course based on its weightage.
- **Programme Educational Objectives (PEOs)** of a programme are the statements that describe the expected achievements of graduates in their careers, and also in particular, what the graduates are expected to perform and achieve

during the first few years after graduation. The PEOs may be guided by global and local needs, the vision of the Institution, long-term goals, etc. For defining the PEOs the faculty members of the programme must continuously work with all Stakeholders: Local Employers, Industry, Students, and Alumni.

- **Programme Specific Outcomes (PSO)** are what the students should be able to do at the time of graduation with reference to a specific discipline. Usually, there are two to four PSOs for a programme.
- **Graduate Attributes (GA)** are exemplars of the attributes expected of a graduate from an accredited programme. Graduate Attributes are the qualities, skills and understandings a university community agrees its students should develop during their time with the institution. These generic graduate attributes outline the overarching capabilities that will be developed by students.

OBE and Course Designing

Designing a Course is part of the science of teaching and learning. It is integral to OBE that insists upon the determination of learning outcomes as the first step. Precisely drawn outcomes of a Course provide clarity of purpose in teaching/learning. They act as a running thread of quality control across the planning of curriculum, selection of instructional strategies, choice of the learning experience, and preparation of tests. Informing learners about the outcome well in advance, OBE enables ongoing concurrent self-assessment of learners for making sure of their progress towards attaining the outcome. It provides them with chances to demand new learning experiences that ensure the same. Since the outcomes are stated, the teachers also get to know the progress and they enjoy the legitimate right to test whether the learners have attained the goal.

Basic Principles of OBE

An OBE curriculum means starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction, and assessment to make sure this learning ultimately happens. William G Spady is an academic, educational psychologist, and sociologist and is considered the father of Outcome-Based Education (OBE). The four basic principles of OBE (as given by William G Spady) are:

1. *Clarity of focus:* The name itself states that the teachers must be focused on what the students should know, understand, and be able to do.
2. *Designing down:* The definition of what is to be done should be designed so that the student can easily grasp and commit to what he has achieved by the end of the programme. Once this has been done, all the related decisions are then made ensuring the desired result is achieved.
3. *High expectations:* By this principle, it states that the teachers must set high and challenging standards for the students so that they get encouraged and get engaged deeply in learning.
4. *Expanded opportunities:* Teachers must attempt to provide expanded opportunities for all students. This principle is based on the belief that not all learners can learn the same stuff in the same way and at the same instant.

Bloom's Revised Taxonomy (2001)

Benjamin Samuel Bloom (1913-1999) with collaborators Max Englehart, Edward Furst, Walter Hill, and David Krathwohl published a framework for categorizing educational goals: *Taxonomy of Educational Objectives* (1956). Familiarly known as Bloom's Taxonomy, this framework has been applied by generations of teachers in their teaching. The framework elaborated by Bloom and his collaborators consisted of six major categories: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. The categories after Knowledge were presented as "skills and abilities," with the understanding that knowledge was the necessary precondition for putting these skills and abilities into practice. Later, a group of cognitive psychologists, curriculum theorists and instructional researchers, and testing and assessment specialists published a revision of Bloom's Taxonomy in 2001 with the title *A Taxonomy for Teaching, Learning, and Assessment*(Table 1). This title draws attention away from the somewhat static notion of "educational objectives" (in Bloom's original title) and points to a more dynamic conception of classification. The authors of the revised taxonomy underscore this dynamism, using verbs and gerunds to label their categories and subcategories (rather than the nouns of the original taxonomy). These "action words"

describe the cognitive processes by which thinkers encounter and work with knowledge.

Table 1: Comparison of Original and revised Taxonomy

Levels of Learning as per Bloom's Original Taxonomy (1956)	Levels of Learning as per Bloom's Revised Taxonomy (2001)
Evaluation	Creating
Synthesis	Evaluating
Analysis	Analysing
Application	Applying
Comprehension/ Understanding	Understanding
Knowledge	Remembering

In the process of writing learning outcomes, the curriculum team would use associated action verbs for different levels of learning. The use of action verbs facilitates alignment of programme and course learning outcomes with assessments. When writing programme learning outcomes, anticipate how student learning will be assessed in relation to each expectation. Vague verbs such as know or understand are not easily measured and need to be substituted with performative verbs such as identity, define, describe, or demonstrate. Some of these action verbs are listed in the below table for consideration (Table-2).

Why Use Bloom's Taxonomy?

The authors of the revised taxonomy (2001) suggest a multi-layered answer to this question, viz. (1) Objectives (learning goals) are important to establish in a pedagogical interchange so that teachers and students alike understand the purpose of that interchange. (2) Organizing objectives helps to clarify objectives for themselves and for students. (3) Having an organized set of objectives helps teachers to: (a) plan and deliver appropriate instruction; (b) design valid assessment tasks and strategies; and (c) ensure that instruction and assessment are aligned with the objectives.

Implementation of OBE in an Educational Institution

The aim of education is to prepare learners for life in society and for performing tasks. It is the intention of the outcomes-based approach to focus as much on the process of learning and the final outcome or result, as on the knowledge and skills. In this way, the process of achieving outcomes during the process of learning can be related directly to the way in which outcomes are achieved in the *world of work*. The outcomes-based approach requires a mind shift in the curriculum process and the way in which the learner should be empowered for the achievement of outcomes. Once all the outcomes are defined, let's start with the simplest implementation process to measure outcomes as per OBE at your institution.

- **Step 1: Defining Outcomes:** This is the most important part of the OBE model. Course Outcomes (CO) are defined for all courses and Programme Outcomes (PO)/Programme Specific Outcomes (PSO) are measured for all programmes in the institution. Course Outcome remains the base of the hierarchy of outcomes and is the tool that can be used to measure student performance in each course.
- **Step 2: Measure Course Outcome (CO) Attainment:** The Course Outcome (CO) is measured through the performance of students in the various assessment tools for the course. Each evaluation tool is mapped to a particular Course

Table 2: Action Verbs for Writing Objectives

Levels of Learning	Action Verbs
Level 6: Creating	*Create:* generating, planning, producing, composing
Level 5: Evaluating	*Evaluate:* checking, critiquing, assessing, concluding
Level 4: Analysing	*Analyse:* differentiating, organizing, attributing, comparing, outlining
Level 3: Applying	*Apply:* executing, implementing, classifying, calculating, constructing
Level 2: Understanding	*Understand:* interpreting, exemplifying, classifying, summarizing, inferring, comparing, explaining
Level 1: Remembering	*Remember:* recognizing, recalling, describing, listing

Retrieved from http://cei.ust.hk/teaching-resources/outcome-based-education/institutional-resources/obe-principles-and-process

outcome (CO) or an action verb in Bloom's Taxonomy and further each verb is mapped to a particular CO.

- **Step 3: Measure Programme Outcomes (PO) Attainment:** Once the Course Outcome is measured, the programme outcome can be measured by using a CO-PO matrix. This helps the institution to measure the Programme Outcome through the performance of students in each course. The weightage of mapping of each CO with the relevant PO can be specified. Once the weightage and mapping of the CO-PO is over the programme outcome can be evaluated. The mapping factor for each CO and PO can also be defined on a three-point scale, where 3 means high relevance, 2 means medium relevance, and 1 means low relevance.
- **Step 4: Programme Educational Objectives (PEO) and Graduate Attribute (GA) attainment:** Once the Program Outcome (PO) is calculated the Program Educational Objective (PEO) and Graduate Attribute (GA) performance can be calculated using a PO-PEO matrix and PO-GA matrix. A few more data such as alumni and employer feedback etc. are required to measure the PEO.

Strengths of the OBE Framework

Whether OBE education is suitable for traditional education setups, in an organizational setting with adult on-the-job learners, the outcome-based approach has obvious benefits.

- **Clear Purpose:** Both students and educators are aware of the desired outcomes right from the beginning, so they know what they're working towards. When dealing with adult learners, this can be a very attractive quality. Employees want to know how the training will benefit them.
- **Goal-Oriented:** Working toward a goal can be very motivating. Having a bar set in advance keeps learners and educators on track. When assessments too are properly designed and conducted, outcome-based education can be fulfilling. Learners, who may be in training because of a need gap identified on the job, know that they'll improve their performance at the end of it and put in the work to succeed.
- **Practical Emphasis:** There can be less theoretical talk and more action in outcome-based training. If training upskills employees, then they'll need to show they have learned the skills at the end of the assessment. The decision-makers gear the curriculum toward this.
- **Flexible Approach:** It's up to the ingenuity of the educator to impart the content so all students can absorb and understand it. Assessments need not be rigid—they should provide every opportunity for students to show their mastery. We know this as an 'expanded opportunity'—students get every chance to succeed. With modern approaches to organizational training, outcome-based education really shines. Simple, focused course design that allows learners to absorb information effectively also helps organizations achieve their own goals efficiently.

Criticism of OBE

With a subject as broad as education, there'll be opponents of every system. It isn't possible for everyone to agree on the best approach, nor is the same approach appropriate in all situations. OBE too has faced its share of resistance over the years. Here are a few criticisms to consider:

- **It Misses the Nuance:** Some believe we can't measure all learning in terms of outcomes. In an OBE system, constant progress is the purpose. For young learners, educators and parents might prefer a more exploratory approach. A rigid OBE approach for the arts and humanities can also be a challenge.
- **Assessment is Everything:** All learners are expected to reach the same level with no exceptions. While this keeps the pressure on educators to ensure all students excel, it can hurt those with a different learning style or those with learning challenges. Some educators also believe that measuring student progress against their own prior performance is an effective and motivational strategy, which OBE does not provide.
- **Too Much Flexibility:** While flexibility is a strength of the outcome-based system, it can be a failure as well. The OBE education approach is merely a set of guidelines that isn't prescriptive. It's up to the local authority—be it school, institute, or board—to decide what the outcomes are and what the mode of assessment should be. If the programme is poorly designed, with improperly

defined outcomes and assessment strategy, the result can be a bad learning experience. In India, many institutes of higher learning have embraced outcome-based education. Overall, even at the school level, elements of an outcome-based learning approach have been filtered down and have been integrated to make learning more impactful and measurable.

Benefits of OBE for Students

At present, the OBE system is being widely used by leading institutions across the world. Many educators have developed a curiosity to understand the reason behind the ongoing learning transformation. Well, the reason is simple! OBE is an educational methodology where each aspect of education is organized around a set of goals (outcomes). Students should achieve their goals by the end of the educational process. Throughout the educational experience, all students should be able to achieve their goals. It focuses on measuring student performance through outcomes. The OBE maps and measures students' performance at every step. The OBE model aims to maximize student learning outcomes by developing their knowledge and skills.

The OBE system also referred to as standard-based education, has proven to be a success in helping institutions measure their learning outcomes and at the same time enabling students to develop new skills that prepare them to stand out with their global counterparts. These factors can contribute to raising the education standard and aid institutions to acquire accreditation from esteemed accreditation bodies such as the NBA accreditation by improving continuously in the long run. On the contrary, when we speak of the traditional education system, it is highly dependent on theoretical aspects of learning. It repeats the routine way of teaching-learning process that just focuses on memorizing the skills of students rather than skill development. It hardly provides any chance for students to develop new skills which might be useful for building their careers. In short, the benefits of OBE for Students are as under:

- Brings clarity among the teachers and students
- Every student has the flexibility and freedom of learning in their way.
- There is more than one method of learning
- Reduces comparison among the students as everyone has a different target
- Completely involves students taking responsibility for their goals

How to Assess Better Using OBE?

OBE breaks the stereotypes of paper and pen tests. Rather, they assess students' performance, knowledge, and skills in many other ways. Quiz, solving puzzles, giving an online presentation, modeling something, and taking up a multiple-choice assessment, are some of the few. Assessments are criterion-focused which the students achieve during the learning period. Students are expected to go with the flow and think out of the box in order to implement OBE. Today's school systems should set clear-cut rubrics to route the student through success. OBE settles these burning issues that burn the current education scenario with super ease (1) *Students were not assessed uniformly* - The traditional method of teaching waited for the end of the course to assess the students. Similarly, it didn't assess them uniformly. Rather it is completely vested in the biased nature of the teachers. OBE shunned both these practices by building up a rigid education platform with patterned assessment techniques that made education fun and entertaining. (2) *Outcomes were not assessed uniformly* - OBE matches the 21st-century skills and values every single outcome of the learner. Along with the above, the following pointers sum up the mastery behind outcome-based education:

- Clear-cut criteria for what constitutes mastery
- A thoughtful way of instruction that adapts to specific learner needs
- Complete assistance for learners as and when they face challenges
- Adequate time is given to achieve mastery

Even William Spady, the self-proclaimed father of Outcome-Based Learning (OBE) when he first initiated OBE, he wouldn't have thought that his brainchild would come this long way in the field of Education.

Challenges During the Implementation of OBE

OBE implementation can be challenging during the implementation phase and be taxing to maintain the records. Following are the challenges faced and requirements found while moving towards OBE (Agarkhed, 2017).

- Fine tuning of the academic curriculum to meet the ever-dynamic requirements of the industry.
- Need to move from a curriculum-based education approach to an OBE approach.
- Need to transition from a teacher-centered approach to student-centered approach
- It is important to keep in mind how to deliver the topics rather than making chapters while framing the syllabus.
- To develop models, the usefulness of the course to students is to be rigorously analyzed and if necessary, changes are to be incorporated.
- As per the syllabus what the student learns, may become obsolete within 2-3 years.
- Emphasis has to be given to a *process-oriented approach* rather than a *person-oriented approach.*

Conclusion

Outcome-based education is the need of the day in the Indian higher educational system, not only in the field of Engineering but also in Social Sciences and Humanities because a lack of skills development has been identified in higher education from many sectors. There is no rationale to restrict OBE to engineering alone when it is easily adaptable to any branch of study. In many countries, it is applied to all levels of education for desirable outcomes. A thorough paradigm shift is needed from various sectors if we desire to implement this approach as it starts from the institutional environment and culminates in the outcome-based evaluation process (Janetius, Mini & Padmanabhan, 2017). OBE is more of a philosophy than a uniform set of practices. Successful implementation of OBE may take time and energy to (1) Produce meaningful content and (2) Construct reliable metrics and rubrics for OBE assessment. As the University Grants Commission has made it mandatory for Higher Education Institutions (HEI) to follow the system of OBE, workshops are needed to be organized in different HEIs in the country in this direction for redesigning the programmes and courses. One of the reasons that OBE can lead to successful student learning is that it encourages teachers to be well-prepared. Teachers simply cannot provide students with appropriate opportunities to learn if they do not take the trouble to assess the student's prior knowledge, to identify possible difficulties, to select appropriate content and learning experiences, to reflect on the moral and ethical principles implicit in their teaching, and to consider all these things in light of the needs, interests, and backgrounds of particular students. Outcomes-based programming makes teaching purposeful and systematic, rather than haphazard, while still allowing students to discover, follow their interests, to take responsibility for their own learning, and to develop both personally and academically. It enables teachers to provide students with appropriate and purposeful learning experiences and opportunities so that they can develop originality, self-motivation, and independence at the same time as they acquire useful knowledge and skills.

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University News

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New Year 2023

Changing Dimensions of Universities Transforming Higher Education for Global Sustainability in the Context of National Education Policy–2020

Ashok G Matani*

Sustainability challenges are real, and there is a global shortage of suitably trained talent around the world. Higher education needs to be reimagined or redesigned with sustainability in mind. Fortunately, there is a growing number of online courses that all higher education institutions (HEIs) around the world can leverage as they build their own ecosystems. It is time for the HEIs to make sustainability and sustainable development goals (SDG) literacy a core requirement for all faculty members and students. Sustainability education at its core exposes students to real-world problems and immersive learning and research experiences. Ultimately, the education culture at the HEIs needs to change so that it encourages students to learn via experimentation and critical thinking from multiple perspectives. HEIs need to increase efforts to encourage young minds to take up sustainability education and careers, and to continue to effectively communicate the immense benefits of sustainability in terms of economic growth, human well-being, and a healthy planet Earth.

A holistic curriculum reassures students of the analytical style of the traditional, moral and political frameworks of their day-to-day lives. The holistic curriculum includes: The essential significance of understanding learner development in context, as a basis for understanding the documentation of special educational needs for different students, the significance of perception that students do not know everything, and trusting that alteration is conceivable, the need to communicate understanding and resolve the difference between the people who have useful knowledge, the need to distinguish between the learning environment as a site for the development of teaching know-how and the creation of knowledge, deep understanding of teaching and of oneself as a teacher.

National Policy on Education (NPE) 2020 is built on the foundational pillars of access, equity, quality, affordability, and accountability, this policy is aligned with the 2030 Agenda for Sustainable Development and aims to transform India into a vibrant knowledge society and global knowledge superpower by making both school and college education more holistic, flexible, multidisciplinary, suited to 21st century needs and aimed at bringing out the unique capabilities of each student. Education must also cultivate in young people spirituality, admiration for the natural environment, create a sense of social justice, intellectual capacity, physical-fitness, health maintenance, career-preparation, leadership, emotional-health, self-appreciation, civic-responsibility, cultural-engagement, family-relationship, peer-relationship, community-care, art-appreciation, moral-commitment, and spiritual-quest. hence making education an inspirer of learners' creativity, imagination, compassion, self-knowledge, social skills, and emotional strength.

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COVID-19 Pandemic Explored New Opportunities for Universities

New levels of integration are required between those collaborating, from science, technology, and engineering disciplines through to the arts, humanities, and social sciences. In addition to the capacity to engage in integrative research for the SDGs and to provide investment and protected niches for challenges by generously contributing their scientific knowledge and resources to help in the fight against the pandemic. Within a few weeks after the onslaught of the deadly virus, universities developed a faster and cheaper COVID-19 test in places as diverse as Colombia, the United Kingdom, and Viet Nam. Laboratories within universities have produced medical supplies, sanitizing equipment, medicines and ventilators. In sub-Saharan Africa, several universities have been at the forefront of epidemiological research and communication to the public on the COVID-19 crisis, notably in Ghana and Nigeria. Before the February 2021 coup, two universities in Myanmar, Yangon Technological University and Mandalay Technological University, designed robots that can transport food, medicine

and trash at hospitals and thereby reduce the need for person-to-person contact. The strong contribution that research universities can make is conditional upon governments recognizing and respecting their key scientific role. In Brazil, several universities stepped in to provide health advice to the population, in the absence of evidence-based policy guidance at the highest levels of the federal government.

Multidisciplinary, Interdisciplinary, and Transdisciplinary Curriculum

Multidisciplinary brings together knowledge from different disciplines to address a given issue.

The process of knowledge production and power relations between disciplines is mostly left unaffected in multidisciplinary collaborations. Each discipline works in a self-contained manner without aiming to transform the disciplines themselves.

Interdisciplinarity describes a mode of knowledge production that focuses on coordination and interaction between different disciplines to both advance knowledge and action. In contrast to multidisciplinary, there is an attempt to integrate scientific practices, including information, data, concepts, and theories from more than one discipline

Transdisciplinarity was introduced as an explicit addition to interdisciplinarity to describe collaborations that go beyond coordinating interactions between different disciplines and aim at transcending them, therefore moving beyond disciplinary boundaries. In addition, transdisciplinarity rests on the premise that researchers alone cannot solve these problems, and that therefore academic boundaries also need to be transgressed through the incorporation of extra-academic actors and knowledge into processes of problem-definition, knowledge production, and knowledge use.

Reforms Introduced in The Higher Education System

With the increasing need for a creative, multidisciplinary, and highly skilled workforce for employment, the Indian higher education system needs to be re-adjusted and revamped to meet the emerging requirements. Some of the key reforms introduced vide NEP–2020 in the Indian higher education system include: -

Quality Universities and Colleges

Recognizing the problems which are currently prevailing in the higher education system in India, which inter alia include poor employability of the educated workforce, severely fragmented higher educational ecosystem, poor learning outcome and development of cognitive skills of students, rigid separation of disciplines with too much early specialization and streaming of students into narrow areas, NEP 2020 intends to completely overhaul and re-energize the higher education system in India.

Institutional Restructuring and Consolidation

NEP–2020 intends to end the fragmentation of higher education by transforming higher education institutions into large multidisciplinary universities and colleges, each of which will aim to have 3,000 or more students. The idea is to build vibrant communities of scholars and peers, break down harmful silos, enable students to become well-rounded across disciplines (including artistic, creative, and analytic subjects as well as sports), develop active research communities across disciplines (including cross-disciplinary approach) and increase resource efficiency, both material and human across higher education.

Shift Towards Holistic Education with Less Rote Learning

It is proposed that multidisciplinary universities and colleges will facilitate the move towards high-quality arts education with flexibility in curriculum and engaging course options being developed and offered to the students. Pedagogy for these courses will strive for significantly less rote learning and an increased emphasis on communication, discussion, debate, research, and opportunities for cross-disciplinary and interdisciplinary thinking.

Internationalization

NEP–2020 focuses on promoting India as a global study destination providing premium education at affordable costs. It is thus intended that high-performing Indian universities will be encouraged to set up campuses in other countries and similarly select universities will be permitted to operate in India. Research collaboration and student exchange programs between Indian institutions and global institutions will be promoted and the credits acquired in foreign universities will also be permitted to be counted for the award of a degree.

Teacher Education

Recognizing the importance of creating a team of teachers that will shape the next generation, NEP 2020 lays equal emphasis on revamping teacher education as well. The teacher education needs to be conducted within composite multidisciplinary institutions having departments of psychology, philosophy, sociology, neuroscience, Indian languages, arts, history, and literature as well as various other specialized subjects such as science, mathematics, etc.

Professional Education

The practice of setting up stand-alone technical universities, health science universities, legal and agricultural universities or institutions in these fields shall be discouraged and all existing stand-alone professional education institutions will have to become multi-disciplinary institutions by 2030, either by opening new departments or by operating in clusters.

Promoting High-quality Research

Recognizing the importance of knowledge creation and research in growing and sustaining a large and vibrant economy and uplifting society, To focus on research and promote research culture in all higher education institutions in an interrelated and coordinated fashion, NEP 2020 provides for setting up of a National Research Foundation (NRF) which would bring a quantum jump in funding and support for research. The overarching goal of NRF shall be to enable a culture of research to permeate through universities and higher education institutions across.

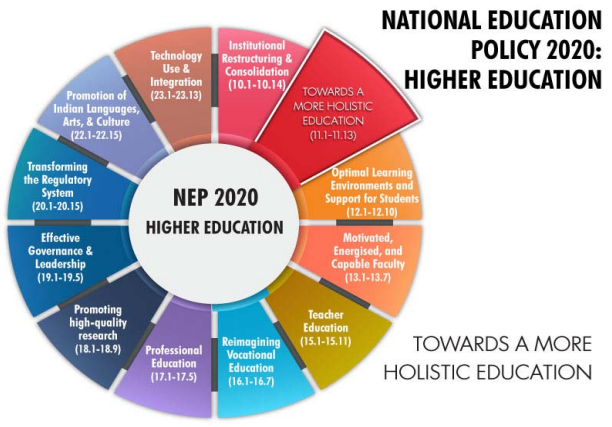
Transforming the Regulatory System of Higher Education

India also has some of the toughest requirements in the world for setting up higher education institutions, which requirements are largely input-centric, focusing on land and space norms, endowment funds and their sources, etc. NEP 2020 mandates for setting up of a common regulatory regime for the entire education sector, eliminating duplication and disjunction of regulatory efforts.

Some Novel Examples of New Roles of Universities: The World Scenario

University of Victoria in Canada Encourages Research Within Indigenous Cultures

The University of Victoria in Canada implemented the plan, launched in 2017 as the



Source: www.educationworld.in

University of Victoria Indigenous Plan: 2017-2022, recognized that the fundamental purpose of higher education is to provide students with the knowledge that will best support their achievements and success throughout their future lives. The plan also recognized that, if their delivery of that knowledge centered only upon one model of education – a Eurocentric or Western model – then they were not serving their students well, even misleading them and actively discouraging under-represented students who did not see themselves in their education. Instead, the University of Victoria noted that its intent was to provide students with diverse academic learning environments, curricula, and approaches to research within which Indigenous cultures, histories, and knowledge are embedded. The plan is, holistic, inclusive, and adaptive. In addition to addressing the campus environment for student learning and faculty research, the plan reflects upon how faculty and staff might work together in new ways and new institutional structures, how governance systems of the University must become more inclusive and equitable, the importance of Indigenous language preservation, and how Indigenous ways of knowing are evolving, not static. Just as 'Western knowledge' is constantly being reviewed and updated with new ideas, Indigenous ways of knowing are similarly dynamic, evolving systems of understanding about how our societal norms and the natural world change and evolve over time.

UACH Mexico Developed a New Educational Model Innovation, Design, Undertakings and Acts For Sustainability

In recognition of the strategic role of HEIs in working towards sustainable development the

Universidad Autónoma de Chihuahua Mexico (UACH) developed a new educational model that heavily promotes inter- and trans-disciplinarity through its training schemes, which focus on societal challenges and contributions to global development and the betterment of society. Through a humanistic and competency-based approach, this educational model, called *Modelo Educativo para el desarrollo sostenible* (UACH-DS), considers innovation, design, undertakings, and acts for sustainability (IDEAS Transformadoras). The study divisions under this model are ordered in such a way that collaborative approaches to academic work are prioritized, crossing disciplinary and professional boundaries. Such interdisciplinary approaches to divisional training are part of the preliminary approach to the professional world and allow for training and competency development rooted in the emerging problems of society. The central study divisions developed at UACH include Accounting, Administration, and Economics for Social Development; Philosophy, Arts and Humanities; Matter, Energy, and its Transformation; Health and Human Welfare; Society, Justice, and the Rule of Law; Sustainability and Food Security. These study divisions have been linked with university competencies (in the form of learning units), as well as transversal competencies to provide students with the tools to work in a variety of fields of knowledge. While students specialize in professions as they continue in the cycles, engagement with other areas of knowledge is a consistent component of this educational model, as is consideration of social, economic, cultural, and natural environments. Furthermore, each of the study divisions within this model is explicitly linked to the 17 SDGs. For example, the Studies in Society, Justice and the Rule of Law is linked with SDG 5 on gender equality; SDG 10 on reduced inequalities; SDG 11 on sustainable cities and communities; SDG 16 on peace, justice, and strong institutions; and SDG 17 on partnerships for the goals.

Tsinghua University China Supports its SDG-focused 'Global Strategy

In April 2016, Tsinghua University announced the launch of a programme reforming its organization and management of scientific research, aiming particularly to promote 'interdisciplinary teaching and research, 'integration of military-civilian research', 'systematic efforts for frontier research, and 'application-oriented translation of scientific and technological achievements'. In July 2016 Tsinghua University launched its 'Global Strategy', aiming to fulfill its mission of implementing the SDGs as a university through four identified functions of universities: teaching, research, societal service, and cultural transitions. As a result of the University's policies and measures of promoting teaching and research across conventionally defined disciplines, Tsinghua University moves ahead of other universities in China in playing a role in implementing the SDGs that only universities can play. As of 2020, Tsinghua University has 410 SDG-related research institutions, and in that year its faculty and students conducted 9,253 SDG-related research projects, leading to more than 10,000 patents and 494 cases of successful practical application of scientific and technological achievements. In implementing a national goal to peak carbon dioxide emissions by 2030 and achieve carbon neutrality by 2060, a team at Tsinghua University has developed key technology in the form of the high-resolution emission inventory of regional air pollution sources, on the basis of which a national three-kilometre high-precision grid inventory is formed through a large number of industrial point sources, traffic line sources, and agricultural non-point sources across the country through multiple-dimension and multiscale coupling technologies. In 2020 the university opened 1,151 SDG-related undergraduate courses, 1,166 SDG-related graduate courses, held thousands of SDG-related student activities, and organized 408 SDG-related social training programmes.

Utrecht University in The Netherlands as an Agent of Change for Sustainability

Utrecht University has created spaces for integrative research, through discussion and scholarship, to foster invention, inspiration, and community spirit, and aims to be a 'safe place for a meeting of minds, both from within the university and beyond'. The integrative strengths illustrated by Utrecht University are evidenced by the more than 1,200 academics brought together within the Pathways to Sustainability strategic theme and who are working together on responses to the climate crisis and biodiversity loss through 13 research institutes. They include diverse disciplines from law and planning to Earth sciences and economics and draw on expertise from the Copernicus Institute

for Sustainable Development and the Urban Futures Studio to explore pathways to just and sustainable futures for all. Pathways to Sustainability advances innovative research via selected thematic areas. The focus in 2022 is on identifying and understanding transformative pathways in five hubs: Future Food Utrecht; Towards negative emissions; Transforming cities; Water, climate and future deltas; and towards a circular economy and society. The University sees itself as an agent of change for sustainability and has adopted a 'living lab' approach integrating its key roles of research, education, and business operations and providing spaces where researchers, students, and managers work together to find solutions for a sustainable campus and, by extension, society

The Federal University of ABC (UFABC) in Brazil Establishing Intellectual Frameworks for Collaborative Research

The Federal University of ABC (UFABC) in Brazil was established in 2006 was designed with an innovative interdisciplinary pedagogical plan. There are no departments, and the university explicitly seeks to foster interaction between academic members from different backgrounds. The reasoning behind creating such an open framework for collaborative research is that such interdisciplinarity contributes to academic excellence, which is in turn seen as a condition for social inclusion. Excellence is a fundamental characteristic to be fostered at UFABC, which aims to achieve high levels of quality in teaching, research and outreach. Strategic research units were created to contribute to the full implementation of the University's education programme. The activities developed by these units ensure their projects are innovative in nature, through cooperation and interdisciplinary integration between the different centres and other bodies of the UFABC, promoting knowledge in specific areas. One example is the Strategic Unit for Strategic Studies in Democracy, Development and Sustainability. The initiative brings together professors and researchers from diverse academic units at UFABC, representing six undergraduate courses (International Relations, Economic Sciences, Public Policy, Territorial Planning, Environmental and Urban Engineering and Biology), and four postgraduate programmes (Humanities and Social Sciences, Territory Planning and Management, Public Policy, Environmental Science and Technology). The strategic objectives of this Unit are to propose and produce, based on an interdisciplinary approach, teaching, research, and extension on the themes of democracy, development, and sustainability.

IPRE University of Oregon - USA Uses a Reflexive Research Model of Community Science

The Institute for Policy Research and Engagement (IPRE) at the University of Oregon in the USA uses a reflexive research model of community science. Faculty and students from the University of Oregon partner with Oregonian Government and NGOs, as well as local community groups, to identify and conduct research projects. IPRE research partnerships are best described as 'reflexive', in so far as research projects begin with a shared notion of research as a public good, one that serves a social function. As such, a collective understanding of what constitutes a socially and environmentally relevant research project is used in selecting what will be researched, with whom, and how. IPRE projects are driven by a messy process of social engagement that acknowledges the variegated interests and needs of different publics, going on to use an iterative research methodology that incorporates different forms of knowledge and understanding to expand how research takes place and is in turn applied.

University of Global Health Equity (UGHE) Based in Rural Rwanda Strengthens Health Systems

The University of Global Health Equity (UGHE) based in rural Rwanda is a high-quality health sciences institution helping shift the centre of gravity in expertise and know-how from where it has traditionally been, within higher-income countries, to lower-income countries, and the continent of Africa specifically. To ensure Equity in Education and to address disparities, UGHE provides high-quality, affordable, or free education through full or partial scholarships. UGHE innovates funding methods such as the Umusanzu model to build and strengthen health systems in disadvantaged places. The Umusanzu agreement, for medical students to be educated free of charge, is made between UGHE, the students and the Ministry of Health of the students' country of origin and is part of what makes UGHE unique. Upon graduation, students commit to serve, under the direction of their Ministry of Health, for a period of six to nine years according

to the difficulties of the placement, which can range from a city to a remote area or refugee camp. This is done to strengthen health systems and serve vulnerable communities, either in their own country or anywhere their government sees fit. Graduates work with their Ministry of Health to determine how long and where these placements will be.

Swaraj University in Rajasthan India Encourages Research

Swaraj University located near Udaipur in Rajasthan, Northern India, it was established in 2010 to provide an innovative form of higher education that was simultaneously accessible to learners, provided a richer and more meaningful experience, and could underpin the building of a more just and environmentally sustainable world. Small communities, movements and local practitioners are reconceptualizing learning in terms of a re-entanglement with land and place, with story and story-making practices, with gift culture as a touchstone for community living, with collective intelligences and subtle forms of consciousness, and with the messiness that comes from being in tune with oneself, with one's roots and with plural ways of knowing the world. In the spirit of trans disciplinarity, students, known as *khojis* (or seekers), can simultaneously explore several fields of study from organic agro-forestry, eco-architecture and renewable energy to alternative healing and film-making, all underpinned by a focus on self-designed learning and livelihood-regenerative entrepreneurship. Use of Hindi and local languages is encouraged, and experiences are designed to reconnect learners with their purpose and cultural environment as well as with the rest of nature. At the same time, there is an explicit challenge to the dominant culture of consumerism, waste and unlimited economic-technological growth. The two-year programme consists of a combination of reflective group meetings, mentorship with an experienced practitioner (drawing on the Indian *guru-shishya* tradition), and experiential learning outside of the institution, in local communities and with civil society organizations, start-ups and social movements. 'Unlearning journeys' are also offered, such as the bicycle pilgrimage, in which the *khojis* travel without any money, technology, plans or first aid to more authentically engage with villages and traditional wisdom and innovation of India. These experiences are compiled in a unique portfolio which the graduates can then use in their professional lives.

USA National Science Foundation Enhancing Action-Oriented Research

In February 2021, the USA National Science Foundation funded an innovative partnership between Alaska Pacific University (APU), the University of Alaska Fairbanks (UAF), and the University of Colorado Boulder (CU Boulder) to host a new US$5 million Navigating the New Arctic Community Office (NNA-CO) . The NNA-CO will include both research and indigenous advisory boards, will offer expertise and advice to the office, advocate for more collaborative, equitable, and action-oriented research, and facilitate dialogue on topics including the coproduction of knowledge and reconciliation. The decision-making and philosophical approaches of the NNA-CO will also follow seven Guiding Principles. These include effective communication for community building, a focus on convergence and collaboration, the acknowledgment of multiple ways of knowing and learning in Arctic research, a recognition of Arctic Indigenous Peoples' right to self-determination under the UN Declaration of the Rights of Indigenous Peoples (UNDRIP), a commitment to long-term institutional transformations that may be needed to address complex Arctic challenges, the recognition that Diversity, Inclusion, and Equity principles are foundational for programme success, and a commitment to human security and safety throughout the Arctic. Finally, the NNA-CO will host four strategic objectives: the coproduction of knowledge with Indigenous peoples, convergence research, culturally responsive education, outreach, and open science. The NNA-CO will also work to increase recognition of indigenous knowledge, issues of data sovereignty, and the need for more collaborative and inclusive research design.

Conclusions

The role of university is to educate for the constant change, through development and induction of skills and competencies of critical rationality which provides the intellectual willingness for permanent change and production of new knowledge. The role of the university is to instill among the learners a deep-rooted pride in being Indian, not only in thought, but also in spirit, intellect, and deeds, as well as to develop knowledge, skills, values, and dispositions that support responsible commitment to

human rights, sustainable development and living, and global well-being, thereby reflecting a truly global citizen. The university has a major role in the affirmation of a development project and national sovereignty in the conditions of globalization in the contemporary world. To achieve that, it's necessary to find a new structure of academic and professional formation and to renew its faculty practices with the incorporation of new teaching methodologies and new information and communication technologies.

It is important for universities and HEIs more broadly to retain their position as arenas for developing and debating critical ideas, basic research and education, and freedom of thought. However, it is crucial that they strengthen their role now, as providers of knowledge and solutions in order to play a key role in this agenda, by exploring and explaining the risks to societies and the natural environment, advising on remedies, and engaging in societal transitions (in technology, social norms, consumption, law, the economy and distribution of goods) that counteract the risk of dangerous shifts in climate and ecosystems. This calls for a radically new mode of inter- and transdisciplinary action in research and education, a matrix in which new horizontal structures and platforms add to the vertical, often silo-like structures of faculties and their departments. It also calls for much more active collaborative research agendas are becoming more common, and new technologies are transforming researcher workflows. Expanding the number of free and open knowledge platforms has the potential to accelerate knowledge acquisition among populations previously unable to access higher education. The recent growth of open online educational resources and massive open online courses (MOOCs) provides tremendous opportunities for training, knowledge acquisition, and sharing for, and among, under-resourced populations.

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Envisioning Creative Curriculum in the Purview of National Education Policy–2020

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The curriculum is a complex structure that encompasses academic domains in a comprehensive frame, yet elaborates on each of its componential perspectives. Parker, Ann (2019) points out that, *'effective teachers don't cover the curriculum, they uncover it'*. Understanding the theoretical basis of the evolving patterns over periods of time will provide a basis for the formation of concepts pertaining to what curriculum is, how it has been perceived and put forth to gradual changes; defining, practicing, and experimenting it time and again to give a new dimension of thought by the pioneers that laid the formation of innumerable curriculum theories. The theories evolved and changed the facet of education and disciplines around the globe in the cultural, historical, political, and socio-economical perspectives, and in the millennial times, the theories catered to communication and technological dimensions providing new insights and scope for adding up new knowledge and idea to the existing bases of knowledge on curriculum.

Curriculum defines the basis for construction of knowledge right from the basic levels of education to higher education. Any dimension of knowledge and belief system to be propagated or to be disseminated is done through curriculum incorporation. Ideas, morale, value systems, beliefs, thinking patterns, and desired socio-cultural ideas are disseminated by the means of the curriculum which is fostered in young minds right from basic schooling. This creates a future theory and becomes a history of beliefs, and value systems of a nation by which the nation identifies itself to be developed in that aspect.

Creative Curriculum

Creative curriculum has been interpreted as a curriculum that has evolved based on research aiming at enhancing academic outcomes by comprehensive means that feature inquiry, exploration, and discovery as the foundations of learning by enriching content. A creative curriculum concentrates on encompassing all the developmental dimensions, especially the cognitive, social, emotional, aesthetic, and physical aspects. It aims at changing the classroom scenario into a more meaningful, active, and interactive based one rather than the usual teacher-dominated and monologue teaching. Creative curriculum implies the innovative trends in the teaching-learning process aiming at the qualitative development and resourcefulness of the individual based on critical and creative abilities building knowledge grounded on a scientific basis.

Since the concept and the term 'Creative curriculum' is used as a phrase even in the recent past more specifically to relate it to mean an action verb, significant theories are yet to evolve a strong theoretical basis to substantiate the core meaning of creative curriculum as that of concepts like, 'core curriculum', 'hidden curriculum' and 'excluded or null curriculum'. A creative curriculum aims at bridging the gap between the stakeholders especially the student and the teacher in identifying the objectives and expected outcomes and achieving better academic standards. The creative curriculum aims at preparing children not only for academic success but also in their life by preparing their minds to critically analyze, solve problems, and find solutions in critical situations.

Bases of Creative Curriculum

The historical basis of the creative curriculum is attributed to the theoretical principles of Berry Brazelton's evidence-based theory of child development (1992), Maslow's theory of human needs (1943), Erikson's theory of psycho-social development (1950), Child psychiatrist Stanley Greenspan's emotional development theory of 'helping the whole child' (1979), Jean Piaget's theory of cognitive development (1936) and Lev Vygotsky's socio-cultural theory (1934). The child in the creative curriculum context is understood in terms of the needs, strengths, and interests which further are understood based on the cognitive, social,

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cultural, and emotional developmental aspects. The creative curriculum is a composite organization where the different facets play a significant role in the understanding and implementation of the teaching-learning processes (Table-1).

Perspectives of Curriculum Theories

Curriculum perspectives are broader and deeper in its essence of the theory and practice. Essential aspects that serve as the guiding principles of curriculum have been theorized by pioneers based on which the present-day academic structure is built. Along with the changes in development curriculum structures around the world had taken its shape and course without losing its essence and effectiveness.

In the *Indian context* indigenous curriculum perspectives evolved from the ancient period right from the *'Gurukula system of education'* to the 'systems of global standards education' as rooted in Indian culture and beliefs that were the major systems adapted and taught in the *Nalanda, Takshila and Vikramshila.* The indigenous system of Indian education played a significant role in shaping up the present structure of education which has been rooted in the ideals of *Swami Vivekananda's Education of the Self, Mahatma Gandhi's Basic Education, Jiddu Krishnamuti's Education of the mind, Sri Aurobindo's Integral Education, Tagore's Art and Culture Education.* The following are a few curriculum theories that defined the curriculum perspectives of the 20th century in the international context,

- Benjamin, Harold's Saber-Tooth Curriculum (1939)
- Jenkin, David's Classic and Romanticism in the curriculum landscape (1972)
- Eisner and Vallance's Curriculum orientations: academic rationalism, cognitive process, social reconstruction, self-actualization and technology (1947)
- Skilbeck, Malcom's School and Cultural Development (1973)
- Inglis, Fred's Ideology and the curriculum: the value assumptions of system builders (1974)
- Hirst and Peter's Concept and Aims of Education (1970)
- Kamii, Constance's Curriculum based on Piaget's theoretical relevance for educational practices (1974)
- Michael, Young's Curricula as socially organized knowledge (1973)

Table-1: Foundations of Creative Curriculum

Components of Creative Curriculum	Role of Teacher in the implementation of creative curriculum context
• to know and understand the children better • to create a sensitive, responsive and protective environment • to understand what and how children learn and specifically why children find it difficult to learn • to teach children with care and concern • community partnership and family • involvement in the children's study and development • building foundation for lifelong learning • include children with disabilities	• provide varied experiences • give children enough time to learn and practice and to develop and acquire new skills • to care children and to develop positive and constructive relationships with each of the child • create a safe environment where children can explore • provide scope for learning new language and to acquire varied language experiences • work on to offer follow-up and continuity in caring children responsibly
Classroom layout	**Goals & Beliefs**
• easy accessibility to materials and its organization • scope to access materials that pertains to their distinct areas of interest • scope for outdoor play and activities where they can explore • variety of learning materials	• building language and literacy skills • discover mathematical relationships • learning through play experiences • music and art • sensory learning modes • providing responsive and individualized care • appreciate individual differences

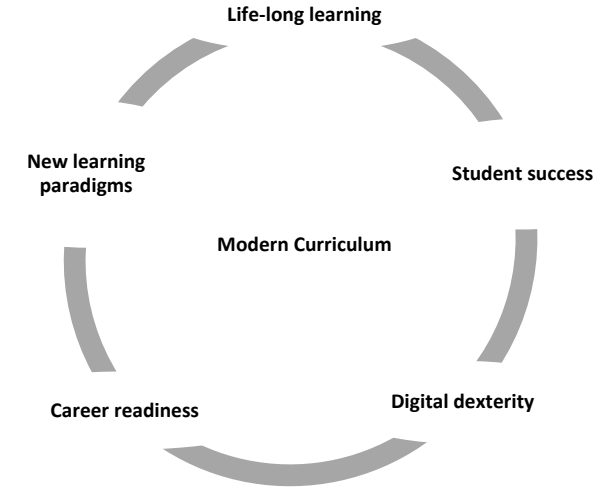
- Freire, Paulo's Pedagogy of the Oppressed (1970)
- Dewey, John's The child and the Curriculum (1956)
- Phenix's Realms of curriculum (1964)

Each of the above theories provides a multi-dimensional perspective of the curriculum which serves as an affluent basis in the understanding of the curriculum practice that is in vogue in the present-day context. Furthermore, the review of the studies on the whole curriculum and its objectives provides the functional basis of knowledge on the following areas and how these ideas influence the present-day curriculum practice in a larger way in almost all the dimensions of the educational process; the areas being, the logic and reason of the curriculum, curriculum significances and the intended opinions, benefits and education, curriculum and the educational priority area at work for the community school, community education: instruction for inequality and the problem of balancing the curriculum objectives (Hirst, 1969; White, 1973; Wilson, 1971; Merson & Campbell, 1974; Eisner, 1971).

Present-day Curriculum Trends

Many curriculum paradigms have evolved over the recent years and each of it has been strongly rooted in the theoretical basis to define the academic course, and regulate the stream of study and structural aspects, goals, process, and outcomes. Modern curriculum (figure-1) is generally defined by specific characteristics such as relevancy, and synthesis in the approach where the integration of systems and processes are applied to achieve the desired objectives (Davis, 2021).

Fig-1. Characteristics of Modern Curriculum



Source: Davis (2021)

Seth (2021) observed that there needs to be a significant change wherein he advocates children must 'choose to learn, instead of being forced to' and further the curriculum should be self-directed rather project based. Further, Seth (2021) opines that the foundation of the modern curriculum is student-centered, self-directed projects. In this context, the courses should be practical tools for students which could be used by the students to carry out their projects. In view of proposing his theory Seth (2021) proposes the following courses and their curricular objectives to realize self-directed and project-based learning. The courses are mathematics and statistics, games, language, literature and communication, history, politics, propaganda and citizenship, real skills meant for life and safety, scientific knowledge methods, programming, art and culture, decision-making, and meta-cognitive abilities.

To have a modern curriculum in place the courses that are considered essential are to be taught cumulatively for a period of time with which the system-based limitations of education could be overcome. Phande (2019) noted that the current trend toward education in the Indian scenario is unplanned and what is needed is the need to be creative and productive. Further, it may be noted from the study that, 'the present creativity level of most of the students is found to be unsatisfactory, but it has been suggested that it can be improved with the help of creative workshops and thinking skills and activities. National Education Policy (NEP, 2020) lays emphasis on the interaction of education and technology in the curriculum development process, the policy document further observes that one of the vital principles to navigating the education system will be the appropriate application and use of technology in teaching and learning process, increasing access to technology and improving education planning and management.

Creative Curriculum as an Emerging Field

Standard review of studies or related literature are limited in the domain of creative curriculum expect from few course preambles of international academic institutions and sports organizations such

as Teaching Strategy, Trentonk, Eastmoaa, Marquette Child Care Centre, Denver Athletic Club, etc., in the terms of Teaching Strategy (2010), a creative curriculum is one in which students learn through original and dynamic teaching learning strategies.

The term *creative curriculum* is gaining ground in the academic scenario nationally with NEP (2020) proposing sweeping changes in school and higher education and in the international context in the forthcoming years, research on this specific area 'Creative Curriculum' will through light on its objectives and basis of theory. In recent years the term 'creative curriculum' has been interpreted only in the context of introducing an innovative and defined school level, especially pre-school level curriculum with all the activities defined as to mention the course highlights. The context of evolving with the idea of 'creative curriculum' will be a futuristic and insightful effort as the concept of 'creative curriculum' seems more relevant in the present-day context.

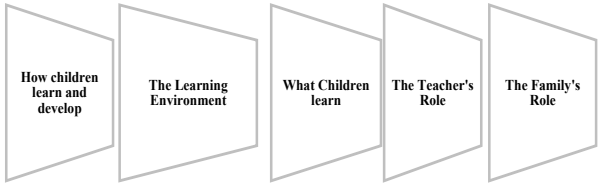
In the Indian context, the major agencies of education and the policies highlight the need to have a comprehensive curriculum that is indeed in terms of a creative curriculum. Based on an overview of National Education Policy (NEP—2020), National Council of Educational Research and Training (NCERT) National Council of Educational Research and Training (NCERT) began working on developing the State Curriculum Framework for nearly four states for School Education, Early Childhood Care and Education (ECCE), Teacher Education and Adult Education based on the field inputs and research-based outcomes of the need analysis of the State Council of Educational Research and Training (SCERT). The idea of developing Curriculum Frameworks on the basis of a 'Creative Curriculum' will prove to be beneficial and futuristic in bringing a major shift in the development of scientific thinking, blending of technology, infusion of critical learning skills, and creativity in the learning process.

Guiding principles of Creative Curriculum

The fundamental principles of creative curriculum for the preschool level as put forth by the Research Foundation - Teaching Strategies (2010) are presented as follows; the principles guide and practice to understand the reasons for intentionally setting up and operating preschool programs in particular ways based on creative curriculum:

- to hold constructive interactions and maintain positive relationships with parents and stakeholders of students that provide a critical foundation for successful learning
- to enrich psycho-socio and emotional competence as they play a pivotal role in school success
- to aim at independent, activity-oriented, purposeful and constructive play that supports basic and critical learning of children
- to improve the infrastructural environment that impacts the type and quality of learning interactions in the teaching-learning process
- to hold community involvement and teacher-student and teacher-parent interactions that promote development and learning.

Fig-2. Creative Curriculum Ideas, *Genie Epp (2017).*



Source: Research Foundation: Teaching Strategies (2010)

The underlying principles of the National Education Policy (NEP, 2020) are to identify the potential and to recognize and nurture unique capabilities in each student by promoting creativity and critical thinking to stimulate logical thinking, decision-making, problem-solving, and innovation. Based on the extensive review of studies it may be observed that each of the education centers/ organizations especially in the foreign scenario has evolved with the guiding principles of creative curriculum envisaged in the context pertaining to their academic program.

- to develop and maintain a positive and healthy socio-emotional relationship with each child thus implementing fostering of creative and critical skills.
- to provide sociable, friendly care to provide scope to enhanced communication on the children's part.
- to augment learning experiences that help children feel skilled and proficient to carry on with and to

provide children with challenging choices to carry out critical tasks.

- to initiate talk with children to respond to children's attempts to communicate and build trust-worthy relationships to develop positive communication
- to value children express their emotions and provide opportunities to express themselves

Source: The Fisher Early Learning Center (2020), University of Denver

The guiding principles of the creative curriculum should have been evolved by theorists of the curriculum development discipline bearing in mind the significance of the traditional theories as bases and the recent theories on curriculum development as the futuristic basis. Presently as far as the reviews of studies are concerned about the creative curriculum the principles are developed mostly for the preschool levels. The guiding principles of creative curriculum for the other levels of education are to be developed based on the theories that would guide to achieving the course objectives and learning outcomes.

Bharucha (2021) insisted on reform to alter the curricular poise away from rote subject knowledge towards the development of cognitive skills and critical thinking which he identifies as, a basket of sub-skills namely scientific temper, risk-taking, logic, analyzing one's own preconceived notions, skepticism, open-mindedness, bias-free attitude, learning from mistakes, constructive criticism, etc.

Teacher and the Creative Curriculum

The place of a teacher in the creative curriculum is non-negotiable. Teachers' participatory role right from their contribution to the development process till evaluation of the effect and outcomes of the curriculum is indispensable; followed by the role of the teacher in the curriculum development process their role in taking it to the children by means of conceiving the curriculum outcomes, objectifying it and planning for the transaction and interpreting it in a constructive way, assessment of the outcomes, is crucial. Fullan (1991) noted the significance and the level of teacher involvement as a vital aspect of curriculum development which has a direct impact on the achievement of educational restructuring. Handler (2010) observed the need for teacher involvement and commitment as a significant aspect in bringing content relevance in the curriculum as teachers are more aware of the student's needs.

The function and responsibility of the teacher in the creative curriculum are still crucial and only in the transaction process the outcomes of the creative curriculum objectives are truly achieved for the achievement of this, the teacher's interpretative knowledge and their creative ability to constructively interpret the curriculum objectives are essentially significant.

Attributes of Creative Curriculum Teacher

The teacher who could take up the creative curriculum to the students are engaged in the process of observation, guided teaching, constructive, and decisive and are able to assess their pupil's progress not only quantitatively but also qualitatively.

- Their interaction with the students is continuous, and comprehensive and can meet the individual and group learning needs of the students.
- The creative curriculum teacher's key skills include their ability to interpret their pedagogical knowledge in a more constructive way, interpreting it more meaningfully by relating their subject matter with scientific and real-life experiences with pupils' subject knowledge.
- Enabling the children to focus on finding out unusual and lateral ways of problem-solving, and authenticate their learning based on finding out solutions through practical activity and project work.
- The creative curriculum teacher is not confined to the classroom alone instead their class extends from the four walls to the outdoors.
- The creative curriculum teacher is more interactive; student participation and interaction are vital components of a creative curriculum teacher; there is no single means of involving students in their learning as the means of transacting knowledge but a variety of creative academic processes.
- For each of the schooling levels creative curriculum teacher's role and teaching methodology varies. At the elementary level, it involves dramatic play, games, art, reading, play, and discovery.
- At the middle school level, it is the concretization of learning experiences based on modeling,

learning from teaching aids, experienced-based learning, etc.,

- At the higher stages creative curriculum teaching involves, rationalizing thinking, guided discovery, self-regulated learning, project-based learning, critical LSRW skill approach, outcome based learning, and application-oriented learning are the methodologies that creative curriculum teachers advocate.

Creative Curriculum: Implications on Teaching-Learning

- Theoretical, research, and practically oriented constructs on the creative curriculum will be a futuristic approach in developing a sensitive model in bringing a paradigm shift in the field of education.
- The curriculum essentials from the conceptual level will get a complete replenishment and the focus will be on modern development-oriented trends.
- Creative curriculum will be an adaptive trend in academic practices that concentrate on innovation aiming at the overall development of an individual with analytical skills that are scientific and at the same time holistic that may hold student's interest to be creative.
- Transactional methods greatly vary and in turn, there will be a major shift in the concept of classroom-based teaching-learning.
- More of activity, practical, and environmental learning will pave the way when a creative curriculum takes hold of the educational process.
- Varied ideologies of students based on their individual interests will get a form and place in the implementation of a creative curriculum.
- Assessment methods may shift from the traditional tests and marking, and grading schemes to more output-based, product-based assessment methods. In the creative curriculum assessment, there will be a sublime shift in the focus of quantitative evaluation to a more qualitative one.
- There has been a greater dependency on meeting individual differences in learning and ultimately creative curriculum will be a solution in identifying and bringing out the potential of each individual, recognizing and approving their merits based on the creative outcomes.

Futuristic Scope of Creative Curriculum

The creative curriculum will set to be a groundbreaking feature among the existing curriculum practices, especially in the present-day teaching-learning contexts which is heading for a greater change from the usual methods to innovative approaches like blended learning, flipped classrooms, collaborative learning, spaced learning, gamification methods, crossover learning, visual-auditory-kinaesthetic methods.

Creating an indigenous curriculum structure that could suit our system of education which is diverse in disciplines will be a real challenge, as our National Education Policy (NEP, 2020) suggests having a multilateral, comprehensive, and research-based National Curricular Framework by giving equal emphasis to all subjects in the incorporation of vocational and academic streams.

- Create possibilities for activity-based and technology-oriented teaching-learning
- Scope for infusing indigenous content in the curriculum to suit the localized outcomes
- Transforming assessment processes into an effective outcome-based teacher-learner collaborative system
- Promote collaborations across institutions and industries and ensures quality academic standards based on critical thinking
- Aims at providing optimal learning experience to all students by enhancing their skills and capacities

Conclusion

Creative curriculum will be a way forward; a step-in infusing creative curriculum component right from the school level to the higher education levels gradually will have a greater influence in the process of restructuring the present curriculum. Ultimately the aim of restructuring or developing a curriculum in lines of innovation and creativity should aim at being integrated and engaging offering scope for experiential learning, instilling scientific vigour, empowering students to think critically and evolve with essential skills and capacities that are essential

for holistic development. As envisaged by NEP (2020), the thrust is focused on all three domains aiming at character building to create holistic and overall development of the individuals by equipping themselves with 21st-century skills. Creative curriculum scaffolds the construction of curriculum frameworks for School Education, Early Childhood Care and Education (ECCE), Teacher Education (TE), and Adult Education, and curriculum transaction methods are developed ensuring the holistic progress and development of critical skills at large.

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TO OUR READERS

Knowledgeable and perceptive as they are, our contributors must not necessarily be allowed to have the last word. It is for you, the readers, to join issues with them. Our columns are as much open to you as to our contributors. Your communications should, however, be brief and to the point.

Atmanirbhar Villages in India will Lead to Atmanirbhar Bharat

Amit Anil Chandra Shah, Hon'ble Minister of Home Affairs and the first Minister of Co-operation, Government of India delivered the Convocation Address at the 41st Convocation Ceremony of the Institute of Rural Management Anand, Gujarat on June 12, 2022. He said, "Nobody can take from you that which you have learnt. No one can take your knowledge away. You can think out-of-the-box and bring novel solutions to problems. Nobody is born big. It is your actions that make you big and I sincerely hope and wish that you all will do big things in your life and for your country." Excerpts

I am truly excited to be meet you and be in your midst. I am excited because I have awarded this Degree today to people who will work towards realizing Mahatma Gandhi's dream and his vision for this country.

This nation can't become *Aatmanirbhar* without providing the required impetus to its rural development, making rural development an active contributor to the economy, and having rural development take every person in our villages on the path of prosperity. I was asking a few students on the stage about their placements. One mentioned Flipkart, a few others mentioned some established financial institutions. So long as you imbibe the values given to you by IRMA, you will forever be working for rural development. And this is my humble plea to all of you. Keep working for the rural development of this nation all your lives. No one can stop you from contributing. Because contribution does not have expectations. If you want to offer IRMA a *Gurudakshina*, let it be this vow that you will always work towards the rural development of this great nation.

Today, I stand before you in a great institution which even fills me with pride. IRMA was established by Dr. Verghese Kurien, with a vision for the rural development of the nation. Rural development is not theoretical, nor is it just a concept. It happens only when the people working towards it grind themselves like sandalwood, spreading the fragrance, village-by-village. Rural development in the modern day can only be made possible by creating dedicated courses, formalizing, and modifying it to this era's needs and requirements. And I believe that on this land of Sardar Patel and Shri Tribhuvandas Patel, IRMA has made this possible by training thousands of dedicated young professionals like you. I express my heartfelt gratitude to Shri Rath and Dr. Dash for inviting me to be a part of the Convocation ceremony of an institution that is an integral part of the structure of rural development in this nation. Today, 251 graduating students at this institute are not students anymore. You are about to embark on the journey of your life. You are now going to contribute to the society and the nation at large.

Friends, as a child one day I went to fetch a book from the library of Gujarat Vidyapeeth. It was the *Taitreyi Upanishad*. A Gandhian elder in the library stopped me in my tracks and asked me why I, a 17-year-old, was interested in reading a book as esoteric as the *Taitreyi Upanishad*. I replied that my Guru had told me that my education wouldn't be complete without reading it. The elder shared a very important lesson with me, which I am going to share now with you. He said that knowledge or *gyaan* was not limited to a particular domain or a subject. That which can be shared from self to others is real knowledge. Today, as you are going into the world, I urge you to think not only for yourself - for as citizens of India, but it is also your right to aspire for and lead a better life – but also for those for whom leading a better life still remains a dream. I promise you that it will give you self-satisfaction that cannot be quantified. IRMA's motto, *Sa Vidya Ya Vimuktaye* – Knowledge leads to Liberation – is true. Liberation cannot be expressed. It can only be felt. But it cannot happen without self-satisfaction. And the greatest satisfaction can be derived from service to those who need it the most. Today, I remember Dr. Verghese Kurien, who established IRMA to promote sustainable, ecologically-friendly, and equitable socio-economic development of rural people through professional management. And you should remember this. You should also aim to give back to the place from where you've gained so much. You're going from IRMA, having received a lot but now is also the time for you to start giving back to the institute by keeping in mind its philosophy.

Mahatma Gandhi said that the soul of India lives in its villages. This tells us so much about the visionary

** This is a reproduction of the Convocation Address available in PIB Website for wider dissemination of the interesting and useful speech.*

that he was! What he really meant was that in order for this nation to progress, the villages of the nation had to progress. If the nation wants to become *Aatmanirbhar,* the villages of the nation had to become *Aatmanirbhar.* And it all started with the Hon'ble Prime Minister Shri Narendra Modi in 2014. He has presented to us all his grand vision for rural development in the country. And it all starts with people. The development of the people will lead to development all around. The Government, led by Shri Narendra Modi, has worked tirelessly over the past eight years for the development of the people, of villages, and that of India. Can you imagine that over 60 crore people in this country were disconnected from the nation's economy just because they did not have a bank account? They could not contribute to the growth of their own nation because they did not have the means to do it. But today, I can tell you with confidence, that there is no family in the country which does not have a bank account within it. A lot of you are from UP and Bihar and you would know that there were several families, especially from the Purvanchal region who did not have an electricity connection even after 70+ years of independence. But today, the Government has ensured power to the remotest regions of the country. Today, there is a toilet in every household, and we are reaching the one hundred percent open defecation free status very soon. There is clean, fluoride-free, drinking water in every home, clean cooking fuel and free medical facilities up to Rs. Five lakh to all through the Ayushman Bharat card. Another dimension of rural management is the connection of villages with tehsil and district headquarters through a flawless network of roads and through the Pradhan Mantri Gram Sadak Yojana, the Government has established this network. Our villages did not have power connections thereby leaving people, who wanted to establish a business with cold products and the needy who require medicines that are supposed to be stored in cold temperatures, in a lurch. This Government has brought power to each and every village. Khadi, a passion of Gandhiji, was forgotten in his own nation. But since 2014, Khadi has been brought back to the public consciousness in such a proud manner that the turnover of the *Khadi Gramodyog Sangh* has just crossed Rs. One Lakh Crore. Rural development cannot happen without the development of agriculture. More than 75% of this country's farmers own less than two acres of cultivable land. According to NABARD, the total cost of cultivation for such land is about Rs. 6000 to Rs. 7000 per annum. Our farmers often fall into debt traps or end up taking loans from banks for this amount. The Government has provided the farmers with the same amount so as to eliminate the need for a loan. What about the marketing of the farmers' produce? How will this produce reach the market? The Hon'ble Prime Minister instituted the Ministry of Cooperation for the first time in the history of this great nation so that the people at the ground can benefit from it. I assure you that the Ministry is working tirelessly in taking cooperation and collectivism to new heights and towards the development of our nation. To take the development story forward, the Government listed 100 aspirational districts and gave thrust to developmental activities therein and it is my pleasure to inform you that in just over two-and-a-half years, most of these districts are now developed districts and are on the fast track to development. There are now dedicated funds to make districts cleaner and greener and several parameters have been set in place to measure and implement developmental activities.

Friends, this country cannot develop so long as its villages are not developed. Even today, 70% of India resides in villages. There are people who need development interventions. All of us are fortunate to have studied and having a shot at a better life but there are plenty who are not so fortunate. It is thus, our responsibility to work for these people and help them get out of the darkness. Till the time 70% of India does not contribute to the nation's success, there will be no success. As soon as we make 70% of our country a contributor to the development story, the dream of making India a $5 trillion economy will be realised.

The dream of an *Aatamnirbhar Bharat* will only be realised when there are *Aatamnirbhar* villages. But this cannot happen if there is no rural development. This cannot happen without you, the graduates of an institute like IRMA, who have a huge role to play in this story. I hope that IRMA will play a crucial role in taking the cooperative movement forward. Cooperation needs to be inclusive, transparent, and modern. Only then can the people and the villages become *Aatamnirbhar.* It can only happen when institutes like IRMA contribute more to the cause.

Friends, nobody can take from you that which you have learnt. No one can take your knowledge away. You can think out-of-the-box and bring novel solutions to problems. Nobody is born big. It is your actions that make you big and I sincerely hope and wish that you all will do big things in your life and for your country.

Vande Mataram! ❑

CAMPUS NEWS

NAAC Conference on National Education Policy–2020 and Role of Higher Education

The One-day Virtual NAAC National Conference on 'National Education Policy – 2020 and Role of Higher Education for Sustainable Development Goals in India' was organized by the Internal Quality Assurance Cell of C. B. Khedgi's Basaveshwar Science Raja Vijaysinh Commerce and Raja Jaysinh Arts College Akkalkot on December 26, 2022. The event was sponsored by the National Assessment and Accreditation Council (NAAC). About 150 participants across the country participated in the conference. The Chief Guest of the Inaugural Function was Dr. Mrunalini Fadanvis, Vice Chancellor of PAH Solapur University Solapur. The Convener of the Event, Ms S M Paranjape introduced the theme of the event. She informed the objective behind the organization of the conference and how the conference was conceptualized. She also acknowledged the National Assessment and Accreditation Council (NAAC) for financial assistance to the college to organize the event. All the dignitaries were welcomed by Ms. J R Birajdar. Dr. I M Khairadi introduced the guests.

Dr. Leena Gahane in her keynote address on 'NEP-2020 and Sustainable Development Goals', threw detailed light on quality sustenance in HEI in relation to National Education Policy–2020. She mentioned all seventeen Sustainable Development Goals. She gave her expertise that how Higher Education Institutes should accept the regulatory reformation and upgradations of teaching faculties in all aspects and opined that self-evaluation, introspection, competencies among ourselves, inculcating value systems among students. institutional policies, a framework for quality evaluation and its benchmarking, skill development, collaborative learning, syllabus up-gradation, audits of infrastructure including ICT. Facilitation, academic audits, research, innovations, and high spirit IQAC are backbones. The inclusion of multidisciplinary education, technology, desire for learning quest for innovation, etc. will lead towards sustainable development goals. She further mentioned that Higher Education Institutions should incorporate vision and mission. Such type of holistic education system will be nearing to '*Gurukul* system'. All these goals are just like '*Panch ahabhuta'*. She also stressed accountability in terms of ethics and governance, liability, and the expectation of society.

Dr. Mrunalini Phadanvis, Vice Chancellor, PAH SUS during her deliberation on National Education Policy-2020 and SDGs in India attracted everyone's attention towards the inclusion of multidisciplinary, interdisciplinary education, the inclusion of linguistic minorities, and the power of regional languages, academic bank of credit, gender equity, the need for adequate physical infrastructure inclusive environment that nurtures learning for all easy access to disabled students, upgradation of educational policies ensuring social justice, providing safety, etc. She also mentioned that HEI can play a significant role in spreading knowledge and creating awareness in society to adequately achieve the global agenda of Sustainable Development by 2030.

During Technical Session, Dr. Aarsti Deshpande, Director, G H Raisoni Institute of Management and Research Nagpur focused on multidisciplinary and interdisciplinary education. She opined that it is Student Centric Education, which gives opportunities for critical thinking and creativity. Awareness of multidisciplinary education builds a multidimensional vision during the discussion, she gave examples of the TATA industry, AMUL butter's advertisement which is always thinking out of the box technology, language and creativity all going hand in hand. Students are flexible to select any multidisciplinary subject and can do their career. Her enthusiastic and knowledgeable talk made the first session very interesting.

Mr. Yogesh Dandekar from Cummins College of Engineering and Technology Nagpur introduced the concept of a Virtual Lab. He explained the purpose and aim of the virtual lab with different examples. Also, he focused on the advantages and disadvantages of it.

Dr. Nmnrata Lotiya, Head, Mechanical Department, Anjuman College of Engineering Sadas, Nagpur highlighted various aspects of NEP-2020 and SDGs in reference to Academic Bank Credit and the power of Regional Languages in HEI. She first focused on 'ABC'. The Hon'ble Prime Minister of India, Shri Narendra Modi launched the Academic Bank of Credits on July 29, 2021 under the NEP and University Grants Commission has set up ABC as a virtual entity for keeping records of all individuals. She further focused on growth, progress, and success, through spirituality, humanity, and morality, and also explained the significant advantages of ABC, the power of regional languages for innovation and more creativity, what NEP wants is for students should be professionally sound and socially responsible, and spiritually aware.

In the next session, Dr. Gurunath Fagare, Principal Kisanveer Mahavidyalay Vai, at the outset only quoted Swami Vivekananda about education. Further, he explained the attributes of perfection which is required for human beings transformations are needed. Further, he deliberated in detail the version of NEP Advancement in Science and Technology multidisciplinary education pedagogy to learn, and make education more enjoyable, experiential, holistic, integrated discovery-oriented, and flexible. He explained flexibility. He explained NEP in detail in context with HEI.

Ms. Rupam Mahipal, Gswanli Samatan Dharma College Chandigarh presented her article and Mr. M Mhetri, Session Chair adjudged her paper as the best paper. Similarly, the research article presented by Ricky Pahuja, Guru Govind Singh Indraprastha University, Delhi is second, Purnima Kapoor, Goswami Ganesh Datt Sru1atan Dharm College of Chandigarh, third, Amar Vinod Chawan, Institute of Hotel Management and Catering Technology Pune as fourth, and Mr. Vaidehi Vaidya. C-B-Khadgi College Akalkot as fifth. The Five best papers were selected as prize-winning papers. The jury members, Dr. Tipe and Dr. Hru1gazi contributed their judgment. There were twenty-two presenters who presented their articles.

The Valedictory Function was conducted after the paper presentation session. Dr. BN Bhanje, Principal, Santosh Bhimrao Patil College, Mandrup was the Chief Guest during the function, while Shri Subhashji Dharane presided over the function. The opportunity given by NAAC to the college has been precisely utilized in the organization of the event. The function ended with a note about arranging similar events in the future.

Workshop on Research Methodology Course

A ten-day Workshop on Research Methodology Course for Ph.D. Students in Social Sciences is being organized by the Department of Teacher Education, Nagaland University, Kohima Campus, Meriema, Nagaland during February 21-March 02, 2023. The event is sponsored by the Indian Council of Social Science Research (ICSSR), New Delhi. The research scholars registered for Ph. D. programme in any branch of Social Sciences and Humanities may participate in the programme.

The scholars with various methods and techniques applied in qualitative, quantitative, and mixed approaches in social science research. The workshop will have an interactive nature and incorporate group work, interactive lectures, discussions, presentations, and excursions to offer background, theoretical aspects, as well as practical approaches. Specifically, the formulation of the research problem, formulation of the research hypothesis and testing of the hypothesis, conducting a literature review, data collection methods, selection of appropriate parametric or non-parametric statistical techniques for analysing data, and report writing. Resource persons from different disciplines will provide exposure to the participants to a broad range of domains of research methodology.

Social research is the study of society and its various aspects which is all around us. It is a process for producing relevant knowledge for society. It is a more structured, organized, and systematic process than the alternatives that most of us use in daily life. Two basic approaches, qualitative and quantitative, are often applied to social research phenomena. Qualitative and quantitative methods in social science research have long been separate spheres with little overlap. Now a day's mixed method approach is also getting its place in the parlance of social science research but, there has been widespread debate in recent years within many of the social sciences regarding the use of quantitative and qualitative strategies for research. The Topics of the Event are:

- Nature, Importance and Scope of Educational Research.

- Nature of Scientific Methods and Its Application to Education.
- Review of Related Literature.
- Types of Research.
- Variables and Types of Variables.
- Process of Research and Research Proposal.
- Experimental Designs.
- Hypotheses: Concept and Types of Hypotheses, Formulation of Hypothesis, Testing of Hypothesis.
- Types of Sampling: Probability Sampling and Non-Probability Sampling.
- Data Collection Tools and Tool Standardization.
- Web Tools in Research.
- Grounded Theory, Case Studies and Ethnographic Research.
- Report Writing/Thesis Writing, Research Paper Writing, References and Citations, Book Publication and Journal Publication.
- Research and Publication Ethics and Plagiarism in Research.
- Use of Data in Social Science Research and Issues in Research.
- Computer Applications in Social Science Research, Basic Statistics and MS-Excel and SPSS.
- Library and e-library Training.

For further details, contact Course Director, Professor Gyanendra Nath Tiwari, Department of Teacher Education, Nagaland University, Kohima Campus, Meriema, Nagaland- 797004, Mobile: 09871070488, E-mail*: rmcnudtekohima@gmail.com.* For updates, log on to: *www.nagalanduniversity.ac.in.*

Capacity Building Programme

A twelve-day Capacity Building Programme for Young Social Science Faculty Members is being organized by the Chaudhary Ranbir Singh University, Jind, Haryana during February 20-March 03, 2023. The event is sponsored by the Indian Council of Social Science Research, New Delhi. The in- service teachers engaged at UGC-recognized universities/ colleges may participate in the programme.

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

- Research Technique, Focusing on Social Research Methodology.
- Developing Research Instruments and Determining the Best Strategy for Conducting Qualitative Research.
- Working with Quantitative Data or Doing Quantitative Social Research Using Statistical Tools.
- Writing Research Proposals in Order to Obtain Minor/Major Projects from Various Funding Bodies Interested in Social Research Promotion.

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

Faculty Development Programme on Design and Development of Industry-led Curriculum in Technological Era

A nine-day Faculty Development Programme on 'Design and Development of Industry-led Curriculum in Technological Era' was jointly organized by the Academic and Administrative Development Centre (AADC) of Academy of Maritime Education and Training, Deemed to be University and the Association of Indian Universities, New Delhi on December 14-22, 2022 through Zoom Meet. About 1500 applications were received from the participants all across the nation but only 1000 participants were selected in order to ensure active participation and engagement from all of them. Out of 1000 participants, only 685 participants successfully completed the Faculty Development Programme and got the certificate.

There was a total of 8 sessions in the nine days online Faculty Development Programme. Eight experts across the nation deliberated on different topics of 'Curriculum Design and Development' through online mode. They delivered a talk on the industry-ready curriculum for student development, outcome-based curriculum and industry needs, design and implementation of industry-need curriculum, the impact of industry 4.0 and their innovative approach and advancement in technology, and the need for curriculum alignment. They were always shown keen interest in associating themselves with the activities of the various Programmes by sharing their experience.

Prof. Atul M Gonsai, Professor, Department of Computer Science, Saurashtra University, Gujarat discussed the Industry Ready Quality Curriculum for 360-degree Student Development would have certainly equipped the faculty in culling out the skills to make the students industry ready. He insisted on the significance of collaborating with the nearby industry in terms of research, training, and product development, which will enhance the skills of the students.

Dr. Joshua Earnest, Professor, National Institute of Technical Teachers Training and Research, Bhopal discussed how to plan to establish Industry-connect with outcome-based curriculum for the UG and PG Programmes and the other associated courses. He emphasized the importance of Manufacturing, Marketing and Service type of industries and Research and Development type of industries for enhancing the performance of Outcome-based curriculum.

Dr. S Karpagavalli**,** Associate Professor and Head, Department of Computer Science, PSGR Krishnammal College for Women, Coimbatore discussed the Design and Implementation of Industry Supported UG Program and insisted the academicians concentrate on what sort of industries support are expected and the analysis of the suggestions given by the industries in framing the courses, also how and what to be adopted to incorporate the suggestions.

Dr. M Jayakumar, Consultant TATA Electronics, Former Dean, Education, Bharathiar University Coimbatore discussed the Curriculum Construction Process for Industry Led Curriculum and emphasized what set of technological tools and technology platforms to be incorporated for being more productive while designing the curriculum. He insisted on raising the focused question thereby students can actively involve themselves to find answers on their own from the web resources.

Dr. T Devi, Professor and Head, Department of Computer Application, Bharathiar University Coimbatore shared her wisdom on the Impact of Curriculum 4.0 by addressing the necessity for Industry 4.0 and curriculum 4.0. She mentioned the significance of emerging technologies such as AI, Robotics in industry 4.0 and the necessary incorporation to be made into the curriculum to compete. She showcased the Bharathiyar university's curriculum in emerging technologies which would fulfill the cutting-edge technologies demand.

Prof. Vellingiri. P, Senior consultant-Tata Electronics. Chairman-BOG, Government College of Engineering, Salem, Former General Manager-Titan Watch Division, Chairman-QCFI, Hosur Chapter shared his views on problem-solving methods and tools which would address 95% of the quality-related

problems in the factory that could be solved with seven fundamental quantitative tools. He pointed out the employment and business opportunities in India and what are the challenges we would encounter and how that could be addressed.

Prof. Srinivasa Raju, CEO, Pi Square Technologies discussed the advancement in technology and the need for curriculum alignment emphasizing the incorporation of disruptive technologies, 360-degree development and an entrepreneur mindset in higher education. He shared insights on the key sectors for job opportunities and where the focus is to be directed while designing the curriculum.

Dr. Dinesh Babu S.O, Director, K.U.M India Private Limited and Samhitha Marine Private Limited, Chennai, Tamilnadu, India discussed the maritime technologies in shipping industries, the evolution of manned submersibles, challenges in underwater communication, navigation system, sonars, etc. He emphasized the importance of the Scientific Deep Ocean Mission by the Ministry of Earth Sciences, Govt of India.

The welcome address was delivered by Dr. Deepa Rajesh, Director-HRDC and AADC Nodal Officer. The Presidential Address was delivered by the Vice Chancellor, Col. (Dr.) G Thiruvasagam. The Chief Guest address was delivered by Dr. N Panchanatham, Former Vice Chancellor, Tamil Nadu Teachers Education University. He appreciated the Association of Indian Universities, New Delhi for developing the Academic and Administrative Development Centre to perfectly balance the academics and administration in an institution. He inspired the participants by elaborating the top pedagogical methods out of the 150 and thereby equipping the faculty in order to create the best employment opportunities for the students.

The Guest of Honor, Dr. Amarendra Pani, Joint Director and Head, Research Division, Association of Indian Universities, New Delhi delivered his address. He discussed the massive paradigm changes in higher education for the past decade. He insisted on the significance of the reforms, formulating changes to be incorporated by the Policy makers and academic community and the Overview of the FDP was delivered by Dr. T Sasilatha, Dean, Academics and International Relations, AMET.

During the technical session, the Guest Speaker, Dr. Athul M Gonsai, Professor, Department of Computer Science, Saurashtra University, Gujarat discussed the Industry Ready Quality Curriculum for 360-degree Student Development would have certainly equipped the faculty in culling out the skills to make the students industry ready. He insisted on the significance of collaborating with the nearby industry in terms of research, training, and product development, which will enhance the skills of the students. More than 500 participants attended the session and got benefited.

Guest Speaker, Dr. Joshua Earnest, Professor, National Institute of Technical Teachers Training and Research, Bhopal discussed how to plan to establish Industry-connect with outcome-based curriculum for the UG and PG Programmes and the other associated courses. He emphasized the importance of Manufacturing, Marketing and Service type of industries and Research and Development type of industries for enhancing the performance of the Outcome-based curriculum. More than 400 participants attended the session and got benefited.

The Guest Speaker, Dr. S Karpagavalli, Associate Professor and Head, Department of Computer Science, PSGR Krishnammal College for Women, Coimbatore discussed the Design and Implementation of Industry Supported UG Programme insisted the academicians concentrate on what sort of industries support is expected and the analysis of the suggestions given by the industries in framing the courses, also how and what to be adopted to incorporate the suggestions. More than 450 participants attended the session and got benefited.

The Guest Speaker, Dr. M Jayakumar Consultant TATA Electronics, Former Dean of Education, Bharathiar University Coimbatore discussed the Curriculum Construction Process for Industry-led Curriculum and emphasized what set of technological tools and technology platforms to be incorporated for being more productive while designing the curriculum. He insisted on raising the focused question thereby students can actively involve themselves to find answers on their own from the web resources. More than 440 participants attended the session and got benefited.

The Guest Speaker, Dr. T Devi Professor and Head, Department of Computer Application,

Bharathiar University Coimbatore shared her wisdom on the Impact of Curriculum 4.0 by addressing the necessity for Industry 4.0 and the curriculum 4.0. She mentioned the significance of emerging technologies such as AI, Robotics in industry 4.0 and the necessary incorporation to be made into the curriculum to compete. She showcased Bharathiyar University's curriculum in emerging technologies which would fulfill cutting edge technologies demand. More than 430 participants attended the session and got benefited.

Prof. Vellingiri. P, Senior consultant-Tata Electronics, Chairman-BOG, Government College of Engineering, Salem, Former General Manager-Titan Watch Division, Chairman-QCFI, Hosur Chapter shared his views on Problem solving methods and tools which would address 95% of the quality-related problems in the factory could be solved with seven fundamental quantitative tools. He pointed out the employment and business opportunities in India and what are the challenges we would encounter and how that could be addressed. More than 420 participants attended the session and got benefited.

Prof. Srinivasa Raju, CEO, Pi Square Technologies discussed the Advancement in Technology and need for Curriculum Alignment and emphasized the incorporation of disruptive technologies, 360 degree development, and entrepreneur mindset in higher education. He shared insights on the key sectors for job opportunities and where the focus is to be directed while designing the curriculum. More than 420 participants attended the session and got benefited

Dr. Dinesh Babu S.O Director, K.U.M India Private Limited and Samhitha Marine Private Limited, Chennai, Tamilnadu, India discussed the maritime technologies in shipping industries, the evolution of manned submersibles, challenges in underwater communication, navigation system, sonars, etc. He emphasized the importance of the scientific Deep Ocean mission by the Ministry of Earth Sciences, Govt of India. More than 420 participants attended the session.

During valedictory session, the welcome address was delivered by Dr. Deepa Rajesh, Director, HRDC and AADC Nodal Officer. The valedictory address was delivered by Dr. M Jayaprakashvel, Registrar I/c. The Vote of Thanks was proposed by Dr. T. Sasilatha, Dean Academics and International Relations, AMET. Many Participants expressed their views and gave feedback on the programme expecting more programs like this in the future.

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THESES OF THE MONTH

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

Geography

1. Dhawane, Dayanand Shivajirao. **Parbhani Jilhyateel krishi tantregyanacha bhogolik abhyas**. (Dr. Kalaskar S N), Department of Geography, Swami Ramanand Teerth Marathwada University, Nanded.

History

1. Dirwaya, Pratibha. **Malwa ke vikas mein shramik varg ka yogdan: 1885 esvi se lekar 1977 esvi tak**. (Dr. Rashmi Thakur), Department of History, Vikram University, Ujjain.

2. Gaikwad, Pratima Balasaheb. **Marathwadyateel dalit sanghatana: Swarup va karye (Ek chikitsak abhyas)**. (Dr. Suryavanshi N B), Department of History, Swami Ramanand Teerth Marathwada University, Nanded.

3. Gamad, Ravindra. **Lord Louis Earl Mount Batten the last Viceroy of India his times and tenure in India**. (Dr. Prabha Srinivasulu), Department of History, Vikram University, Ujjain.

4. Khan, Aamir. **Mewad ke vikas mein muslim samaj ka yogdan: 1851 se 1950 tak**. (Dr. Rashmi Thakur), Department of History, Vikram University, Ujjain.

5. Lodha, Neelam. **Proto globalization in Gujarat (1600-1800)**. (Dr. A K Singh), Department of History, Gujarat University, Ahmedabad.

6. Lohar, Asmabanu Saleembhai. **Medical geology in early modern India: 1498 AD-1830AD**. (Dr. A K Singh), Department of History, Gujarat University, Ahmedabad.

English

1. Bhatt, Udaykumar Rajendrakumar. **Three cinematic adaptations of Mirza Hadi Ruswa's Umrao Jaan: A study**. (Dr. Narendra K Patel), Department of English, Gujarat University, Ahmedabad.

2. Deric, Kavita. **Teaching English as a foreign language with its difficulties in learning as a second language**. (Dr. Suresh Kumar), Department of English, Bhagwant University, Ajmer.

3. Anita Devi. **A qualitative study on Romen Basu concerned with his major novels**. (Dr. Suresh Kumar), Department of English, Bhagwant University, Ajmer.

4. Gogoi, Monika. **An exploration of the subaltern and feminist voices in Indira Goswami's select novels**. (Dr. Laxman D Jogdand), Department of English, Swami Ramanand Teerth Marathwada University, Nanded.

5. Jan, Aasiya. **Cinematic transformation of Chetan Bhagat: An all encompassing SWOT of his select works with reference to adaptation and Indian cinema**. (Dr. Suresh Kumar), Department of English, Bhagwant University, Ajmer.

6. Khanji, Humaira. **Social perspective and issues in the works of Sadegh Hedayat**. (Dr. Suresh Kumar), Department of English, Bhagwant University, Ajmer.

7. Kharadi, Priyankabahen Jashubhai. **Elements of culture conflict in select Indian English popular fiction**. (Dr. B C Rathod), Department of English, Gujarat University, Ahmedabad.

8. Lohakare, Rohini Jalindar. **English language teaching: Use of smartphone at undergraduate level in colleges in Osmanabad District**. (Dr. Laxman D Jogdand), Department of English, Swami Ramanand Teerth Marathwada University, Nanded.

9. Payal. **Evaluation and development of English language proficiency in technical colleges: Study based on North Indian colleges**. (Dr. Chaitanya), Department of English, Bhagwant University, Ajmer.

10. Pratibha. **A comparative study of the novels of V S Naipaul and Asif Currimbhoy and their play**. (Dr. Suresh Kumar), Department of English, Bhagwant University, Ajmer.

11. Rajora, Vidhi. **Socio-cultural impact of selected partition novels and their film adaptation**. (Dr. Deepak Mudgal), Department of English, Bhagwant University, Ajmer.

12. Sadeeq, Rahid. **Absurdity in the plays of Samuel Beckett Harold Pinter and Satish Alekar**. (Dr. Chaitanya), Department of English, Bhagwant University, Ajmer.

13. Shah, Muneer Ahmad. **English language as a medium and problems faced by rural background students in pursuance of higher education: A study of RBA students in Jammu & Kashmir**. (Dr. Chaitanya), Department of English, Bhagwant University, Ajmer.

14. Shaikh, Gazala Margubhasan. **A critical study of cinematic adaptation of Shakespeare's select plays in Hindi cinema**. (Dr. Nutan Kotak), Department of English, Gujarat University, Ahmedabad.

15. Solanki, Yogini Atmaram. **Reinterpreting myth in the select works of Amish Tripathi and Ashok K Banker**. (Dr. Jinendra Jain), Department of English, Gujarat University, Ahmedabad.

16. Srinivasulu, Ganta. **Postcolonial reading of Amitav Ghosh: A select study**. (Dr. V Pala Prasada Rao), Department of English, Acharya Nagarjuna University, Nagarjuna Nagar.

17. Thakkar, Hardikkumar Babulal. **Writing across 20th century-Raj-PostRaj: Narrative aspects and linguistic elements in the British colonial perspective**. (Dr. N K Patel), Department of English, Gujarat University, Ahmedabad.

18. Thatiparthi, Prathyusha. **A comparative study of implementation of Continuous and Comprehensive Evaluation (CCE) between state and central schools syllabi**. (Dr. G Chenna Reddy), Department of English, Acharya Nagarjuna University, Nagarjuna Nagar.

19. Upadhyay, Nidhi. **Introspecting womanhood: A critical study of the selected books of Sudha Murty**. (Dr. Deepak Mudgal), Department of English, Bhagwant University, Ajmer.

Hindi

1. Ghuleshwar, Shivraj Govindrao. **Sanjeev kee kahaniyoan mein vyavastha ka shikar varg**. (Dr. M D Ingole), Department of Hindi, Swami Ramanand Teerth Marathwada University, Nanded.

2. Makwana, Bharatbhai Chimanbhai. **Keshav Prasad Mishra ka upanyas sahitye: Samvedna aur shilp**. (Dr. M G Gandhi), Department of Hindi, Saurashtra University, Rajkot.

3. Nayak, Madhavi Dilipkumar. **Madhukar Singh ka katha sahitye: Ek samikshnatamak adhyayan**. (Dr. Rajendra Parmar), Department of Hindi, Gujarat University, Ahmedabad.

4. Patil, Usha Kashinathrao. **21vi sadi kee Hindi kahaniyoan mein vyakt nari chetna**. (Dr. Subhash Kshirsagar), Department of Hindi, Swami Ramanand Teerth Marathwada University, Nanded.

5. Ragde, Parashram Ramji. **21vi sadi ke pratham dashak kee Ambedkarwadi kavitaoan ka mulyankan**. (Dr. Laxman T Kale), Department of Hindi, Swami Ramanand Teerth Marathwada University, Nanded.

6. Rajput, Shardadevi Roopsingh. **Manoharshyam Joshi ke upanyasoan mein varnit samasyaye**. (Dr. Omprakash Shukla), Department of Hindi, Gujarat University, Ahmedabad.

7. Rana, Pruthvirajsinh Jashubha. **Dr Rahi Masoom Raza ke upanyasoan ka samikshanatamak adhyayan**. (Dr. J R Dangar), Department of Hindi, Saurashtra University, Rajkot.

Sanskrit

1. Amit Kumar. **Acharyacharudevshastripranitasya Shrigandhicharitgadhkavyasya samikshtmaka-madhyayanam**. (Prof. Ramesh Kumar Pandey), Department of Sahitya, Shri Lal Baha dur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi.

2. Baluni, Vikas Chandra. **Analysis of linguistic elements of Patanjali Mahabhashya**. (Prof. Ram Salahi Dwivedi), Department of Navya Vyakarana, Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi.

3. Devi, Gagneshwari. **A critical study of three shatakas composed by poet Suryamani Rath**. (Dr. Ganesh Shankar Vidyarthi), Department of Sahitya, Central Sanskrit University, New Delhi.

4. Gajjar, Chhayaben Nareshkumar. **Ramayaniye-Arneykandasey Mahabhartiye- Vanpravanh cha tulanatmakam adhyayanam**. (Dr. Yoginibahen Vyas), Department of Sanskrit, Gujarat University, Ahmedabad.

5. Jain, Rekha. **Rajeemateecharitrasya tulanat-makamadhyayanam prakritaapabhranshasahityasya visheshasandarbhe**. (Prof. Kamlesh Kumar Jain), Department of Jaindarshana, Central Sanskrit University, New Delhi.

6. Jain, Sachin Kumar. **A critical study of Acharyamitgati's Subhashitratnasandoh**. (Dr. Sangita Gundecha), Department of Sahitya, Central Sanskrit University, New Delhi.

7. Mandal, Sanjoy. **A critical edition of Aankaramimamsa**. (Dr. Udaynath Jha), Department of Sahitya, Central Sanskrit University, New Delhi.

8. Mishra,Chandrashekhar. **Shuklayajuvedasam-hitayamagniswaroopavimarshah**. (Prof. Sundranarayan

Jha), Department of Shuklayajuveda, Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi.

9. Pathak, Atul Prakash.**Shrimadvadivageeshwaracharyavirachitmanmanohargranthasya samikshanatamakmadhyayanam**. (Prof. Mahananad Jha), Department of Nyaya, Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi.

10. Ramniklal, Rajyaguru Jayeshkumar. **An appraisal of conformity or non conformity of Panini's paribhashasutrani and paribhashavachnani**. (Dr. Navnit J Joshi), Department of Sanskrit, Saurashtra University, Rajkot.

11. Sharma, Abhinav. **A critical study of the examples and counter examples of sutraas of the Karakant part of vyakaranasiddhantkaumudi**. (Prof. Brajbhushan Ojha), Department of Navya Vyakarana, Central Sanskrit University, New Delhi.

12. Sharma, Amit. **Vyakaranshastriyaparishkaranam shikshanavidhervikasah tanmoolyankanancha**. (Prof. Brajbhushan Ojha), Department of Vyakarna, Central Sanskrit University, New Delhi.

13. Sharma, Dayashankar. **A poetical review of epic Shri Hanumachcharitravatika written by Shri Hariharananda**. (Prof. Vidyanand Jha), Department of Sahitya, Central Sanskrit University, New Delhi.

14. Shukla, Sarita. **Dr. Prashasyamitra Shastrinah kathasahityikam sameeksha tmakamadhyayanam**. (Dr. Amit Kumar Shukla), Department of Sahitya, Central Sanskrit University, New Delhi.

15. Somkrishan. **Discuss of the Vedic plant elements**. (Prof. Ramanuj Upadhyaya), Department of Shuklayajuveda, Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi.

16. Tiwari, Sarvesh Kumar. **With reference: A study of kaim in vaiyakaran siddhanta kaumudi till the karka**. (Prof. Subodh Sharma), Department of Vyakarna, Central Sanskrit University, New Delhi.

17. Upadhyaya, Abhishek Kumar. **Kasmiramandalasya yogaparamparaya anusilanam (Shaivasakttiyorvisesasandarbhe**. (Prof. Hareram Tripathi), Department of Sarva Darshana, Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi.

18. Vikram, Shailendra. **Sanskritsahitya yayavaranam jeevanapaddhativimarshah**. (Prof. Shukradev Bhoi), Department of Sahitya, Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi.

Telugu

1. Mallepogu, Rajanna. **Dr V R Rasani kathashahityam-pariseelana**. (Prof. N Venkata Krishnarao), Department of Telugu, Acharya Nagarjuna University, Nagarjuna Nagar.

2. Swaruparani, Shetti. **Dr. Sailakumar navalalu pariseelana**. (Dr. Ch Kalavathi), Department of Telugu and Oriental Languages, Acharya Nagarjuna University, Nagarjuna Nagar.

3. Vijayalakshmi, Paruchuri. **Potturi Vijayalakshmi kathaa saahithyam-pariseelana**. (Prof. N V Krishna Rao), Department of Telugu, Acharya Nagarjuna University, Nagarjuna Nagar.

PERFORMING ARTS

Fine Arts

1. Dinakar, Usha. **Bharatanatam tradition during the Region of Mysore Wodeyars.** Department of Fine Arts, Kannada University, Hampi, District Bellary. D.Litt.

Philosophy

1. Parmar, Manju. **Swami Dayanand Saraswati kee vaicharik kranti dwara samajik utthan evam Bhartiya darshan mein yogdan**. (Dr. Shobha Mishra and Dr. T B Shrivastava), Department of Philosophy, Vikram University, Ujjain.

2. Sharma, Kamini. **Shreemadbhagwatgeeta kee tatva mimansa evam gyan mimansa**. (Dr. T B Shrivastava), Department of Philosophy, Vikram University, Ujjain.

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Sahayog Sevabhavi Sanstha
College of Education
Indira College of Education (M.Ed.)
"Sahayog Campus" Vishnupuri, Nanded-06 (MS)
Affiliated to S.R.T.M. University, Nanded-06
Email ID: girgaonkarbalaji@gmail.com
Ph. No. 02462-229183, 09503849648

WANTED

Applications are invited for the posts of **Associate Professor and Asst. Professor** to be recruited on Full time Regular basis. Number of Posts, Educational Qualification, Reservation, Specialization, Pay Scale & Other details are available on the Advertise published on the websites **www.srtmun.ac.in** & **www.ssscoeb.com.** Application should **reach within 15 days** from the publication of this advertisement.

Principal/ Secretary

हरियाणा केंद्रीय विश्वविद्यालय
CENTRAL UNIVERSITY OF HARYANA
(NAAC Accredited 'A' Grade University)
MAHENDERGARH (HARYANA)-123031

EMPLOYMENT NOTICE

Advt.No.: 01/NT/R/2023 **Date: 06.01.2023**

Online applications are invited, from the eligible candidates for appointment to the following posts on regular basis as mentioned against each post.

POST CODE	NAME OF THE POST	LEVEL & GROUP	NO. OF POSTS & CATEGORY
01	Hindi Translator	Level - 6, Group - B	01 UR
02	Hindi Typist	Level - 2, Group - C	01 UR PwD (OH)

Online Application Form and other related details are available on the University's Website **www.cuh.ac.in.** Any further information in this regard shall be uploaded on the University's website only. The last date for submission of online application is **05.02.2023.**

REGISTRAR

ST. THOMAS COLLEGE, PALAI
Arunapuram P.O., Palai, Kerala-686 574
Ph: 04822-212317
Website. www.stcp.ac.in E-mail: principal.stc@gmail.com

VACANCIES

Teaching (Assistant Professor)

- **Physical Education -1 (General)**

Administrative

- **Librarian (UGC) - 1**

Age and qualification shall be as per UGC/Government of Kerala/Mahatma Gandhi University, Kottayam, norms. The application form and other details can be downloaded from the college website (www.stcp.ac.in). The application fee for teaching post and UGC Librarian is ₹ 1500/-. The fee should be paid by bank transfer to the College Account with South Indian Bank (A/c. No. 0453053000000731), Arunapuram Branch, IFSC SIBL0000453. Duly filled in application forms and all required documents along with the receipt of fee may be submitted to the college office during working hours either by hand or by post on or before the 30th day from the date of this notification.

Palai
07/01/2023

Sd/-
Manager

MAR ATHANASIUS COLLEGE ASSOCIATION
KOTHAMANGALAM, KERALA-686 666
Phone : 0485-2822326, Web : www.macollegeassociation.org

WANTED

Applications are invited for the following notified existing vacancies in the following institution under the management of Mar Athanasius College Association.

MAR ATHANASIUS COLLEGE (AUTONOMOUS)

Category No.1 - Assistant Professor - Botany (4)

Age, Qualifications and Scale of Pay will be as per the norms prescribed by the UGC/M.G University/ State Government. Persons with disability will be eligible for reservation as per G.O(Ms)No. 96/2021/HEDN dated 15/02/2021 and GO(Ms) No. 242/2022/H.EDN dated 18.05.2022.

Application Form and other details can be had from the **Secretary, Mar Athanasius College Association, Kothamangalam - 686 666, Kerala** on payment of Rs.1000/- or can be downloaded from **www.macollegeassociation.org** and forwarded to the Secretary alongwith DD for the requisite amount. Filled up application should reach the office of the undersigned within 30 days from the date of publication of this notification.

Those who have already submitted their applications in response to our notification in December 2021 need not apply again.

08.01.2023 SECRETARY

P.P. Swami Vivekanand Sevashram Sanstha, Shirala's
1. Vishwasrao Naik Arts, Commerce and Baba Naik Science Mahavidyalaya, Shirala
2. Baba Naik Mahavidyalaya, Kokrud
Tal. Shirala, Dist. Sangli-415 408 (Maharashtra)
(Affiliated to Shivaji University, Kolhapur)
(Permanently Granted)

WANTED

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

Sr. No.	Subjects	Sanctioned Posts	Total Sanctioned Posts	Post Reserve for
A) Assistant Professor				
1	**Geography**	1	22	ST – 2, VJ (A) – 1, NT (C) – 1, SBC – 1, OBC – 6, EWS – 2, Open – 9.
2	**Physics**	1		
3	**Botany**	2		
4	**Zoology**	2		
5	**Microbiology**	3		
6	**Mathematics**	1		
7	**Hindi**	1		
8	**English**	1		
9	**History**	1		
10	**Economics**	1		
11	**Marathi**	1		
12	**Commerce**	1		
13	**Chemistry**	6		

Note : For detailed information about posts, qualification and other terms and conditions, please visit University **website : www.unishivaji.ac.in**

Place : Shirala
Date : 06/01 /2023

Secretary
P.P. Swami Vivekanand Sevashram Sanstha, Shirala
Tal. Shirala, Dist. Sangli-415 408 (Maharashtra)

Announcement

Themes for Forthcoming Special Issues of the University News

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

1. ***Research & Excellence for Transformative Higher Education*** to be published on January 30, 2023 on the occasion of South Zone Vice Chancellors' Meet to be held at Andhra University, Visakhapatnam, Andhra Pradesh. Last date for receipt of Article is **January 23, 2023**.
2. ***Evaluation Reforms for Transformative Higher Education*** to be published on February 20, 2023 on the occasion of West Zone Vice Chancellors' Meet to be held at Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra. Last date for receipt of Article is **February 10, 2023.**
3. Special Issue on the theme '**Transformative Higher Education for *Atma Nirbhar Bharat'*** will be brought out in the month of March, 2023. Last date for receipt of Article is **February 20, 2023**.

Guidelines for Contributors and Editorial Policies

To submit the manuscripts for publication, the contributor need to follow the guidelines given below:

- Articles submitted for the Journal should be original contributions and should not be under consideration for any other publication at the same time. A declaration is to be made by the author in the covering letter that the paper is original and has not been published or submitted for publication elsewhere.
- Manuscripts including tables, figures and references should be around 3000-4000 words for articles, 2000 – 5000 words for Convocation Addresses, 1000 words for Book Reviews and 600 words for Communications.
- All the manuscripts should typed in double-space with 12 point font and ample margin on all sides on A 4 size paper.
- The cover page should contain the title of the paper, author's name, designation, official address, address for correspondence, contact phone/mobile numbers and e-mail address.
- The main text should not contain footnotes. References should be given at the end of the manuscript and should contain only those cited in the text of the manuscript. The full reference should be listed at the end in alphabetical order running the following style:

(cont'd. to page 107)

(cont'd. from page 106)

Book

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

Articles

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

Chapter in a Book

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

Article Retrieved from Website

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

- Authors are responsible for any copyright clearance, factual inaccuracies and opinions expressed in their paper.
- No fees is payable to submit or publish in this Journal.

Editorial Policies

- The final decision on the acceptance or otherwise of the article rests with the Editorial Committee and it depends entirely on its standard and relevance. The title and content of the article accepted may be modified to meet the journal's standards of contents, presentation, style and other specific requirement. Authors may also be requested to revise their manuscripts before they can be accepted for publication. Correspondence in this regard will be done with the first named author unless otherwise indicated.
- Maximum time taken for processing the article is six months. Contributors are free to send the material to any other publication after a period of six months from the date of their submitting the article to the University News, if they do not receive any intimation from AIU. Author will receive two complementary copies of the Journal immediately after its publication
- AIU may re-use the articles published in the University News for its various publications.
- AIU may extend courtesy to other journals or websites to use the articles published in the University News if due credit is given to the author(s) of the article(s) and the University News. Only those manuscripts will be published which are sent through E-mail: *ramapani.universitynews@gmail.com* and *universitynews@aiu.ac.in* to:

Dr. S Rama Devi Pani
Editor
University News
Association of Indian Universities
AIU House, 16 Comrade Indrajit Gupta Marg (Kotla Marg), New Delhi-110 002

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Association of Indian Universities

&

Symbiosis University of Applied Sciences, Indore

Welcome

The Delegates
of
AIU Central Zone
Vice Chancellors' Meet –2022-23
(January 17-18, 2023)

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