

Rs. 30.00
ISSN-0566-2257



UNIVERSITY NEWS

A Weekly Journal of Higher Education

Association of Indian Universities

Vol. 61 • No. 28 • July 10-16, 2023

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The Eightfold Nalanda Instruction Model

R Jaishanker*

Early human civilizations evolved independently in Mesopotamia, Egypt, India, China, and Latin America (Levack et al. 2021). A critical population was essential to ensure the success of human civilizations in all these places. Nurturing and augmenting a viable population during those days was a formidable task. It called for applying human intellect and fell on the shoulders of those who picked up relevant knowledge and skills required to overcome challenges. Stated otherwise, assimilation and sustenance of knowledge underpinned the security of early human civilizations. To be sustained, knowledge had to be transferred down the generations. Inter-generational transfer of knowledge hence became non-negotiable and elevated education as one of the social priorities from the very early days.

Historians have documented the importance attributed to education in Mesopotamia, India, and China (Mookerji, 2016; Rochberg, 2014). Over time, education emerged as the most potent means to hold the masses together. Each early civilization would have had an institutional authority around which its educational edifices were woven. The notion of very early institutionalisation (Boix, 2015) of education leads to the question of whether education was ever a liberator.

A closer look at the education system that existed in ancient India paints a different picture. Education in ancient India was a means to build character, achieve control over the self, and attain *Nirvana* or liberation. Hinduism taught students how to search within themselves for liberation (Ram Swarup, 2000; Gandhi, 2011). The noble eightfold path to liberation is a central dogma of Buddhism (Santina, 1984). It is logical to presume that, in the past, only a handful of people would have pursued educational goals to the highest level. Most students would have merely acquired the ability to read, count and measure. Whatever the ground realities, it is beyond doubt that the Orient, in general, and the Indian sub-continent, was the ancient global knowledge hub.

The rise of Occidental influence over the last few centuries led to a realignment of the very purpose of education. Education became a means for individuals to remain relevant and nations to be competitive. Due to its replicability, the occidental model successfully kept pace with the spiking human population. The second half of the last century saw an unprecedented transformation and scaling up of education. Privatisation of education across the entire spectrum was a global

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phenomenon. Many educational institutions became batch processing units that trained youngsters to meet the ever-increasing industrial demand. The Western value system, focused on individual merit and fiscal success, relegated the Oriental value-based education system. Widespread acceptance of the Occidental education model made education a commodity. It generated more froth than stable precipitates.

The consequences of commercialising the educational system are widely reported (Singh, 2018). Commercialisation de-contextualizes knowledge and renders it human-capital-oriented (Arokiasamy, 2012). It exerts pressure at different levels of the system (Anonymous, 2014). Scant attention is paid to the shift in the psychology of graduating youngsters. While the Western model has helped us progress technologically, we can ill afford to overlook its human cost. It eroded us from within (Pink, 2020). The present educational scenario in India is worrisome. The architects of independent India were mesmerised by the meteoric rise of the West. Our national developmental trajectories were defined, looking West. They did not think about the appropriateness of mimicking the Western educational model.

Less than a century down the line, the Indian educational sector has almost reached an abyss when we are forced to invest in the ‘skilling’ of the graduating students. It is high time to think about why we have sunk this deep despite adopting the most influential pedagogical model of the West (Preville, 2023). Our obsession with the Western pedagogical model and rating systems churns out graduates disconnected from our culture, ethos, and value systems. Neither has the system taken us closer to internal or external peace. The authors are not critics of the Western pedagogic model *per se*. It has worked well in the society where it was initially intended for. However, the stark difference in value perception in the West and the East (Hwang, 2001) renders the Western education system incompatible in India. It is incumbent on us to decide how long we can afford to bear the burden of incompatibility.

Identifying and adopting an appropriate instructional model should be a priority during the early days of the *Amruth Kaal*.

An appropriate instructional model from the past lay exposed before us, waiting to be discovered. One glance at the massive step pyramids at Nalanda archaeological sites and their replicas built on the Nalanda University campus is enough to realise their significance. The steps of the pyramids denote the eightfold learning model that would have been practised at the Nalanda Mahavihara. The first step accommodates freshers enrolled at Nalanda Mahavihara. Each higher step represents Observation, Knowledge, Skills, Application of knowledge/skill, Ability to communicate, Ability to come together, and Human values, respectively Figure (1). A student progressing through the eight steps ascends to the highest level of learning to attain Nirvana. The eight steps are like the eight-fold path in Buddhism (Bodhi, 2011).

Right View, Right Resolve, Right Speech, Right Action, Right Livelihood, Right Effort, Right Mindfulness, and Right *Samadhi* complement each other to realise the final objective of education. The right view translates as the proper understanding in the widely acclaimed Western pedagogic model. It stems from an incisive ability to observe things. Right resolve is related to the right thoughts. It corresponds with ‘remember’ in Figure 2. Right speech, interpreted in the modern context, is the ability to communicate

Figure 1: Depiction of the Nalanda Instruction Mode (ÑIM) on a Step Pyramid at the Nalanda University Campus, Rajgir, Bihar, India.

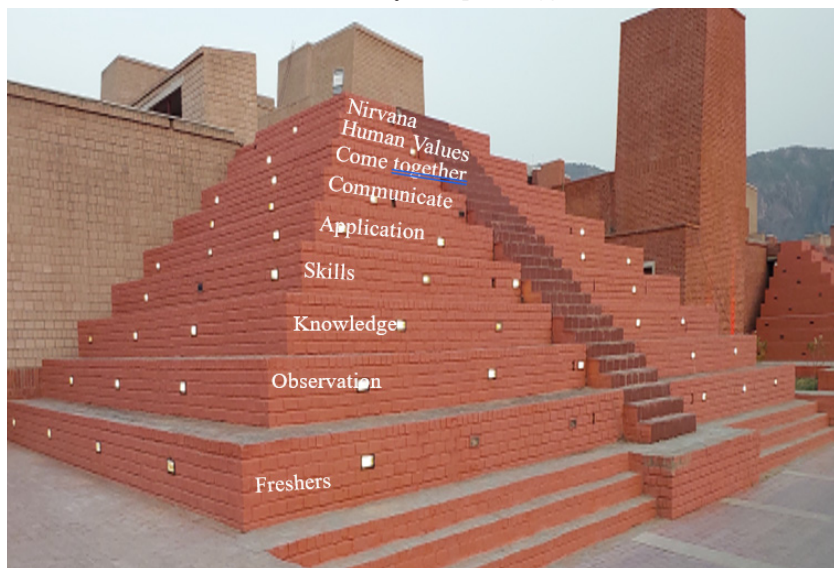
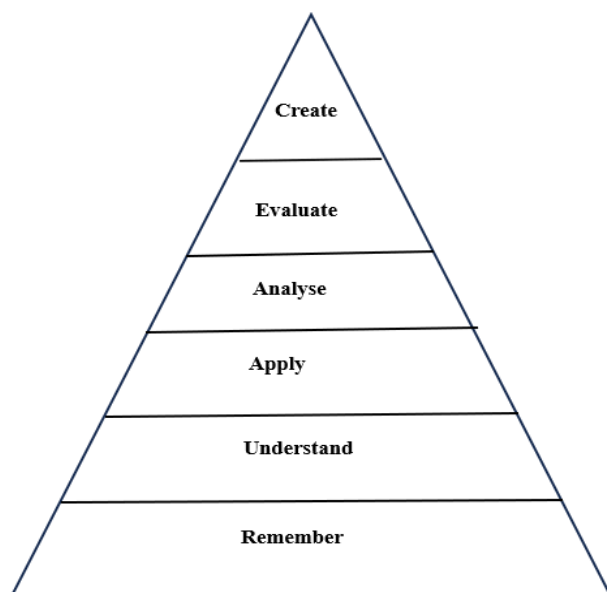


Figure 2: Schematic Representation of the orders of learning in revised Bloom's Taxonomy (Huitt, 2011).



clearly. Right action embodies acquiring skills to translate and apply the understanding in different situations. Right efforts indicate the ability to come together and collaborate. Right mindfulness deals with changing mindset. It emphasises inculcating human values and selflessness, which is fundamentally different from that included under the affective domain of the Western instructional model (Huitt, 2011).

The author puts forth the eight-fold learning path as the Nalanda Instruction Model (ÑIM). In addition to the rigour of the modern instruction framework, ÑIM embodies ancient Indian value systems. The 'bequest value' of ÑIM makes it invaluable and an inspiring addition to the evolving National Education Policy (NEP) 2020. ÑIM emphasises observation, knowledge, skill, translational capability, collaboration, and human values. It can potentially transform Indian education and will ensure peace for the student and his society. It is impressive that an instructional model envisioned at Nalanda Mahavihara more than a thousand years ago is still relevant. Inculcating human values in youngsters has tangible and intangible outcomes, viz. realising national commitments to Sustainable Development Goals and appreciating the phrase 'Vasudhaiva Kutumbakam'.

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The Pursuit of Joy: Understanding Happiness Initiatives in India

Himanshi Yadav* and Y Vijaya Lakshmi**

Happiness is a multifaceted construct and a strong indicator of the “quality of life” and well-being of a person. Well-being refers to the state of overall satisfaction with one’s life and is composed of both cognitive and affective aspects of happiness. Cognitive components are related to life satisfaction which includes various aspects of life such as work, relationships, and health. The emotional component is related to pleasant and unpleasant emotions that an individual experiences in daily life. The “quality of life” is judged through physical and mental health and the overall performance of a person. Happiness enhances individuals’ mental health, decision-making styles, coping strategies, emotional intelligence, spiritual intelligence, creativity, self-esteem, sense of control, makes life goals easier to achieve, reduces anxiety and depression, and other negative emotions, improves individual life satisfaction, etc., (Khosrojerdi et al., 2018). The concept of happiness has been explored by many philosophers and psychologists. Philosophers believe in a holistic approach to looking at life and satisfaction with life, while psychologists believe that happiness is a state of mind or temporary feeling which depends on life satisfaction, pleasure, and positive emotional conditions.

The Indian concept of happiness is derived from the scriptures and ancient texts like the Vedas, the Bhagwad Gita, Buddhism literature, etc. According to them “Peace is happiness and happiness is peace”. According to *Vedanta*, *Ananda* is Happiness, joy, and enjoyment, which refers to “ultimate happiness or bliss”, while *Sukha* is pleasure, comfort, and prosperity which are temporary forms of happiness. Buddhists believe that constructive behaviour leads to happiness, while destructive behaviour leads to unhappiness. It mainly focuses on positive emotions

and an individual needs to stop him/herself from greed, anger, and lust and try to maintain positive emotions. There are three types of approaches in the Indian context of happiness i.e., hedonic, transcendental, and collective (hybrid). The Hedonic approach considers that an individual feels happy when he experiences more positive emotions (love, enjoyment, joy, etc.) and fewer negative emotions (sadness, sorrow, tension, pain, anxiety, etc.). This approach is based on immediate pleasure, success, and comfort. It indicates that happiness is dependent on materialistic, external things and is temporary. The transcendental approach is also known as spiritual orientation. It considers that we get happiness based on our actions i.e., kindness, gratitude, helping others, etc., and when we realize our own true potential, purpose of life, and live a virtuous life. The collective/hybrid i.e., the third approach is a mixture of both, it considers that an individual gets happiness from both things. They believe that happiness is dependent on the needs, goals, rules, and norms to ensure that everyone can live a fulfilling and happy life. India has a rich heritage of traditional knowledge systems that promote sustainable well-being. The Indian knowledge system is a diverse and vast collection of intellectual traditions that originated in India. It includes a wide range of disciplines, including philosophy, spirituality, science, medicine, mathematics, astronomy, arts, and social sciences. There are various components of it which contribute to its diverse nature such as Ayurveda, Yoga, Vedas, Upanishads, Hinduism, Jainism, mathematics, science, literature, and arts. A few components of the Indian knowledge system are closely related to well-being because it gives emphasis on a holistic approach to life. Practices of yoga promote physical and mental health, reduce stress, and make an individual emotionally balanced. These help an individual cultivate a state of well-being by fostering connection among the body, spirit, and mind. The use of herbs and natural remedies is helpful for an individual to cure any disease. Hence ayurveda provides holistic development of health, which directly affects the well-being and happiness of an individual. The Indian knowledge

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systems give emphasis on moral and ethical values such as dharma, karma, and ahimsa which promote both individual and social well-being. The National Education Policy (NEP) 2020 focuses on a holistic approach to education and recognizes the importance of Indian knowledge systems and their integration in the curriculum. Thus, our Indian knowledge systems are the greatest gift of India to the world, and now it's being recognized and accepted all over the world.

Happiness Initiatives in India

Happiness is a key feature of positive psychology and now it's become an important part of policies, programs, economics, and psychology. Happiness has become essential for everyone; thus every country is concerned about the happiness of a person, which depends on mental health, income, social support, freedom, trust, generosity, and many other factors. In 2016 Madhya Pradesh government established "*Anand Basti*" as a happiness department. This department focused on improving the happiness and quality of life of residents of slum areas. It measures the well-being of people in terms of "community, culture, governance, knowledge & wisdom, health, spirituality, and psychological welfare, a balanced use of time, and harmony with the environment". The department runs various programs for improving the well-being of slum people such as *Alpviram*, *Anand sabha*, *Neki ki Deewar*, and *Anand Utsav*. All these incentives have been taken to promote social cohesion, community participation, and the well-being of people.

In July 2018, the Delhi government launched the "Happiness Curriculum" from nursery to VIII class and it is already being implemented in Delhi schools. The Curriculum is released when mental health and happiness are receiving more attention on a global scale. 'Mental health and well-being' is one of the aims of Goal 3 i.e., "Good health and well-being" of the Sustainable Development Goals. The happiness curriculum introduced by the Delhi government has some similarities with the UNESCO Happy Schools Framework. The UNESCO Happy Schools framework is a set of guidelines and recommendations for creating happy and healthy learning environments in schools, which improve the happiness and well-being of students as well as teachers. Every day, 45 minutes of instruction is provided in Delhi schools. The objectives of the Happiness Curriculum are to develop self-awareness,

mindfulness, critical thinking, communication skills, life skills to deal with stressful situations, social values, human values, and holistic approach to education in the universal context. The Happiness Curriculum gives more emphasis to educate children to ensure harmony with their inner being and to discover self in the process of learning, so that they become stress-free and happier adults. The happiness curriculum is based on a triad i.e., momentary happiness, deeper happiness, and sustainable happiness. Momentary happiness can be experienced through our five senses of "sight, sound, touch, smell, and taste" and this type of happiness is only for a shorter duration. Deeper happiness is experienced through our relationships i.e., when someone shows affection, care, gratitude, and respect. Sustainable happiness is experienced when we are aware of our own thoughts, being mindful of our actions, and being free from internal conflict. The Happiness Curriculum consists of three units i.e., "exploring happiness through learning and awareness", "experiencing happiness in relationships through feelings", and "happiness through active participations". The happiness curriculum became the strongest foundation of happiness and well-being for students. A pilot study conducted by Dream a Dream organization found that the happiness curriculum has a positive impact on the relationship between students and teachers, and the students start taking active participation in classroom activity. A survey conducted by Abdul Latif Jameel Poverty Action Lab (J-PAL) found that those students who participated in happiness classes have improved their social-emotional skills such as empathy, self-awareness, and positive behavior compared to those who didn't participate found by and Tata Institute of Social Sciences (TISS) found that students who participated in the happiness classes reported higher levels of happiness and well-being compared to those who did not participate.

After the Delhi government, various other states also started initiatives to promote happiness and well-being of students and started implementing the happiness curriculum at the school level. To promote happiness, well-being, and mental health among school children, the Chhattisgarh government introduced the Chhattisgarh Happiness Curriculum in 2021. The curriculum is built on the ideas of positive psychology, mindfulness, and emotional intelligence. After Chhattisgarh and Delhi, Uttar

Pradesh introduced the happiness curriculum and it emphasizes five values i.e., respect, trust, affection, care, and gratitude. In 2021, in Bhore taluka of Pune some schools introduced happiness curriculum, and it also aims to promote mental health and well-being among school children. The curriculum is more focused on social and emotional well-being, communication skills, and stress management techniques.

Therefore, the initiatives taken by the states of India show that India is trying to promote the happiness and well-being of its citizens. The effort of India is shown in the world happiness report 2023 i.e., now India stands 126 ranked among 136 countries. In the G20 summit held in December 2022, India committed to achieve sustainable development goals which include good health and well-being to ensure and promote healthy lives and well-being for everyone.

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Visible Learning :Trends and Applications in Pedagogical Practices

S Prabu Shankar*

Visible Learning, the concept as conceived by Hattie (2009) explains the literal notion of the phrase 'Visible Learning' (VL) in direct terms stating that when the students' learning is visible, it is representational of the outcomes and achievements, implying that their efforts are directly proportional to their achievement. Further, on the teacher's part, it represents their efforts in transacting the subject area, their efforts towards achieving learning outcomes, and the impact of their teaching on students' learning outcomes.

Visible Learning is a notion that is incredibly easy to understand, in accordance with Professor John Hattie, a leading researcher in the field of education which helps to facilitate student learning in a feasible manner. This implies that teachers to be able to evaluate their own practices in order to assess how they contribute to student outcomes and that all students should be able to observe how their own efforts are progressing their learning outcomes. Visible learning fosters an environment of understanding. Utilizing innovative technologies and creative methods, Visible Learning supports educators in discovering up-to-date more productive ways to teach. Since teaching strategies must adjust to the constantly shifting nature of today's educational world, it is crucial that educators adopt these strategies to achieve positive student results. In order to maximize learning potential, Visible Learning endorses teachers to evaluate the betterment of the learners and continuously improve their instructional strategies.

The scope of visible learning lies in its strength to define the students' level of learning that occurs, which in terms defined as 'visible learning' to the context of learners and Visible learning on the teacher's part aims at achieving 'reception' which means how well the students are learning and not just the part of transmitting the content, the teaching methods, and other objective aspects. A student's conscious performance and their knowledge of how

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their learning happens and how learning is getting transformed into achievement are all components of visible learning.

Visible Learning Trends in Spheres of Education

Visible learning trends are seen happening across the education sectors with the growing awareness on student's centered learning where students' pace of learning, their understanding of how learning occurs, and what needs to be done to comprehend and improve their ability to achieve. Visible learning positively influences and characterizes self-motivation, learner initiation, student-centered learning approach, and learner-controlled instruction. It places students at the center of the education process, further visible learning makes students understand their own abilities, their strength, and their weaknesses, as the student is more aware of the learning processes and makes sure that he /she is able to define what to learn, how to plan and prepare, proceed and ultimately they know and are sure of their achievement (Fisher, 2016).

In the context of visible learning the classrooms are primarily called 'foundational classrooms' and the aim of which is to provide students feedback based upon the students' own self-work that has been submitted for displays and as work samples. This aims at providing a self-reflection to students by comparing their own writing to the other work samples of other students that are displayed in the classroom.

Hattie (2008) defines this as the major aim of visible learning that makes students learning primarily visible to the teachers and secondarily the learning of the student that is visible to themselves. This process results in both students and teachers enhancing their level of academic work towards betterment and progress. From reviewing of studies on the 'practices of visible learning', it has been observed that the practices and basis for priority action are highlighted in such a way that each practice has been clearly scaffolded with the course of action that could establish the defined practice.

Hattie (2012) identified the five major dimensions of how expert teachers act on the practices and has sorted the features that these expert teachers contribute to visible learning which is presented in Table:1 under priority actions.

The following are the estimable characteristics of visible learning that are sorted out of a review of studies:

- increased motivation and desire to learn ;
- awareness of the learning processes and sure of their achievement levels;
- perceive their strength and abilities which helps them to plan for preparation accordingly;
- improved comprehension of the content and the expected objectives to be achieved;
- achieve desired learning outcomes as they are aware of their input levels that determine outcomes;
- in visible learning since learning happens as a conscious process, the materials that are to be learned are sensitively and systematically approached by the learner, this helps them to achieve a deeper understanding of the subject matter;

- Hattie (2012), those students involved in visible learning are termed as ‘visible learners’ and they are able to express their ideas and are open to interaction on the subject matter;
- visible learners accommodate to the classroom environment in a more effective way as they are active participants in the teaching-learning process;
- visible learners engage in various self-learning and group learning activities, they are able to involve themselves fully and carry out academic activities with ease and confidence;

Integrating Visible Learning Practices

It is crucial to pinpoint precisely which aspect of traditional or virtual education contributed to demonstrable student learning. Students must comprehend the subject matter they are learning, the essence of acquiring knowledge, how to evaluate their development, and why it was crucial to have learnt in order to execute this in the classroom. In order to accomplish these objectives, teachers must regularly assess different factors affecting students’ academic performance utilizing success standards and learning intentions.

Table:1 Visible Learning Practices and Priority Actions

Visible Learning Practice	Teachers Priority Actions (Hattie, 2012)
Visible learning depicts the processes and not necessarily the end result; focus on the result may not bring into account the efforts put thereon in the learning process (Richmond & Kew, 2021)	Expert teachers identify the most important way to represent the subjects they teach, especially by organizing and using the content knowledge. Further, they know how to introduce new content knowledge in a way that integrates with their prior knowledge and their needs.
Visible learning benefits the learners by actively involving them in the learning process when the process happens and once the learning happens, it again helps the learner reflect well on each stage of his/her involvement in the learning process.	Expert teachers create an optimal classroom climate for learning. They create classrooms in which errors are considered common and learning can happen by clearing the doubts and correcting the errors.
Visible learning practices contribute majorly in creating documentation for regulatory assessment and quality improvement.	Expert teachers monitor learning and provide feedback; they believe that a typical lesson never goes as planned and they are skilled at monitoring the status of students’ understanding
Visible learning provides scope for teachers, administrators, and educationists to reflect on the curriculum and the subjects therein.	Expert teachers believe all students can reach the success criteria; they believe that all intelligence is changeable rather than fixed; they show a passion that further all students can succeed.
One of the key aspects of visible learning practice is that teachers become evaluators of their own impact on student learning.	Expert teachers influence a wide range of student outcomes not solely limited to test scores; they exert positive influences on student outcomes and those are not confined to improving test scores.

Student evaluation criteria and learning intentions, in accordance with Hattie, can enhance student learning by a factor of two to three, which contributes significantly to educator preciseness. Lay an emphasis on the value of crucial student work and provide teachers the freedom to create learning experiences that motivate learners to utilize information to use in creative and intriguing approaches. Give instructors the chance to reminisce on their practice by providing them the opportunity like career evolution or mentoring sessions.

It is inevitable to make sure that educators have the necessary resources they need to succeed in the classroom and in their surroundings to support them. Encourage the practice of feedback and make sure learners are actively engaged in the whole process. Hattie (2008) defines the preparation of the visible learning lesson involves four crucial phases of planning which is represented in Figure: 1.

Making Visible Learning a Reality

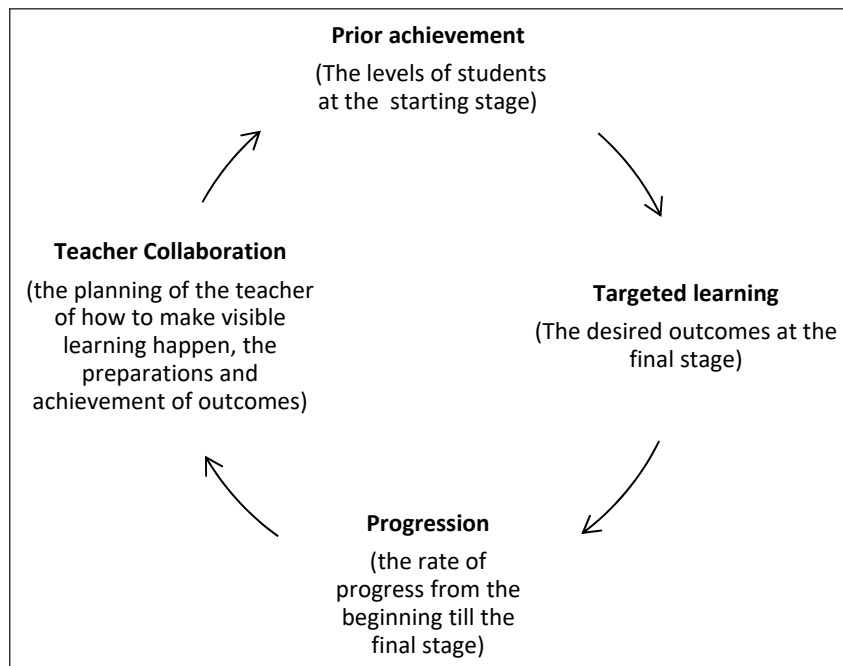
Our comprehensive approach to curriculum aids visible learning practices in the classroom context. Information is organized and conceptual connections are made using the building blocks. It helps in enabling the cognitive abilities to engage in critical thinking since the learners are not having trouble remembering a lot of material. To help kids acquire the idea of thinking dispositions, we have been creating a variety of thinking routines. The kids' ability to reason has also benefited from the universal thinking framework. Teachers and students can now think through challenging tasks thanks to this new categorization. The main concept is to give categories and meanings to the various categories of in-depth thought that are involved in the learning process. For many of our members, this has resulted in tremendous school-wide achievement.

- Concept mapping and advanced organisers are two productive visible learning techniques. Students are involved in

creating "graphical representations or logical structure of the content to be learned" through concept mapping. (Hattie, 2009).

- Incorporating strong cognition tactics such as summarising the core idea(s), synthesising, and analysing relationships, this method is especially beneficial for students who have difficulty with these abilities.
- Because they connect outdated knowledge with current knowledge, behavioural objectives, and advance organisers encourage visible learning. These techniques explain to students what they will learn and how to accomplish the goals they have set.
- Coordinating and developing - Modifying educational materials in a concealed or accessible way to enhance learning.
- Self-consequences - For either achievement or failure, students may devise their own arrangements for incentives or punishment.
- Autodidactic - self-articulating the stages necessary for successfully completing a certain assignment.
- Self-monitoring - monitoring one's own accomplishments and achievements frequently by keeping track of them.

Fig: 1-Phases of planning a visible learning lesson



Reference: Hattie, John. (2008)

A 'Visible' Teacher

'Every student deserves a great teacher not by chance, but by design' (Hattie, 2016). In the context of visible learning the teacher's role is adapting to the learning environment thus observing and analyzing students learning processes and needs based on which setting learning goals and objectives in order to cater to individual needs. In the visible learning process when one strategy of learning is not found to be effective, i.e., that the particular learning strategy is not visibly contributing to student achievement, the teachers' flexibility to adopt another methodology in order to make students understand what they had not achieved with the use of prior teaching methods, this defines their dynamism and their flexibility in approach in the process of visible learning. This flexibility of teachers is termed and they are called 'adaptive teachers' or 'adaptive learning experts' (Hattie, 2012). The role of teachers who make visible learning happen extends their roles in the following ways:

- attending to significant learning needs of students and diverse learning aptitudes of students;
- address students' capacities based on their individual differences;
- attending the learning needs of students in line with their level of conceptual understanding (surface, deep and competent levels (Hattie, 2012);
- knowledge and practice of intervention and their ability to rightly scaffold and advance their students' achievement
- understanding their students' ability based on the fact that 'students making errors' is deemed as a necessary aspect for real learning to happen;
- Hattie (2018) noted that teachers' ability to understand students' learning levels and termed as (novice, proficient, and competent) and provide their feedback specific to the level;
 - feedback offered for the novice is referred to as task (or) product-level feedback;
 - feedback offered for the proficient as process-level feedback and
 - for the competent level, the feedback offered is termed as self-regulation level

Fisher & Frey (2018) observed that with visible learning the focus should be on the students learning rather than increased routines and procedures

designed to increase learning. The major idea that has been conceptualized by understanding visible learning is that learning occurs in phases, from the surface level through the deep level to the competent level. In the visible learning process, 'differentiated instruction' is being planned for catering to the needs of diversity and variety of learning; beyond the basic differences in the ways students understand and learn the variety of ways in which students understanding lies; for example, whether students understand at the surface level or deeply, depends on the entirely on their individual capacities, beyond their differences in conceptual understanding, their learning strategies, their thinking styles and their level of achievement of mastery of the subject demands differentiated instruction for the visible learning to happen to among learners. The collaborative nature of the task and the phases of individual learning, motivational needs are all those that expect differentiated instruction to be in place for visible learning to happen.

- constantly assessing one's performance;
- considering how one's actions may affect the outcomes for students; and viewing oneself as a 'change agent'
- modifying and improving the learning of their students;
- regularly seeking critiques regarding their own performance and their teaching;
- using student evaluations as a tool to gain insight into their own teaching;
- challenging the students constantly and limiting the use of the phrase "do your best";
- talking less and engaging the students in dialogue, making sure they make up over eighty percent of educational settings talk;
- and developing a relationship with the students that will encourage them to ask for assistance and acquire risks with their learning.

Visible learning - Assessment Trends

According to the pioneer researchers in the visible learning domain, Hattie (2012), Clinton & Clarke (2020), the success criteria about which students are conscious about to achieve, creating an understanding of how to achieve and creating learning experiences in order to make sure and verify their progress contributes to the core idea of assessment in the visual learning domain.

Clinton & Clarke (2020) highlighted the need to ensure best assessment practices and student success with regard to the following aspects,

- focus on students learning.
- improve teaching standards.
- teaching students how to set their own learning goals.
- to assess their achievement and to improve their learning deficiency by themselves
- the major method advocated for student reflection and action to ‘collaborative learning, peer tutoring, engage in deep thinking, classifying good and non-acceptable behaviour’ are all practices that students in visible learning adopt to assess themselves.
- the focus on the result may not spell out the learning experiences, the efforts put in by the students, their inquiries, acquisition of new skills the interactions but merely the result alone (Richmond & Kew, 2021)

Leeson (2017) identified and evaluated visible learning practices based on four dimensions which is referred to as ‘visible strands’ namely (a) the visible learner (b) know thy impact (iii) inspired and passionate teaching and (iv) feedback; each of the above dimension is denoted by a set of four attributes namely (i) vision and values (ii) knowledge and understanding (iii) personal qualities and (iv) professional practices. It has been observed from the study that considerable influence was achieved on the part of students’ achievement after the implementation of visible learning in teaching-learning practices.

Visible Learning: A Way Forward

Learning as it has been defined in numerous ways across the teaching-learning and education contexts, ‘visible learning’ makes a significant impact by stressing the perspective that when learning happens visibly to the student primarily and to the teacher as ‘reflection’ based on the teaching processes carried out; visible learning is significant as a theoretical context in the field of education amidst an array of defined learning contexts and theories such as learner-centered instruction, learner controlled instruction, self-paced participative learning, active learning, activity based learning, etc.,

Visible learning makes more sense adding simpleness to the process that happens in the teaching-

learning context. In the global context visible learning trends have already impacted the teaching-learning and education processes by contributing to many critical models that have been put forth based on the ideals of visible learning namely, the DIIE model (Diagnose, Intervene, Implement, Evaluate), 5D model (Discover, Design, Deliver, Double-back, Double-up) (Hamilton et al., 2022). Visible learning practices are carried out functionally on many pilot project basis and one such exercise is creating ‘visible learning teams’ (making learning visible team; that has identified curricular and teaching practices which could enable children to learn in group creatively, critically, and collaboratively.

Two decades since visible learning trends are in vogue and proven a successful learning model the fruits of which are yet to be realized at a wider level both at the theoretical level and functional level. Research in visible learning trends will pave the way in taking forward the many significant understanding of the idea of visible learning that could contribute to evolving the teaching-learning and assessment practices. Visible learning is a theory that has a scope for practice; it has the potential to evolve as a stable method in teaching and learning which can bring in visible changes in the teaching and learning; as a potential theory, it could fine-tune the pedagogical practices in visible ways. As Hattie (2009) observed that, ‘*the greatest effects on student learning occur when the teachers become learners of their own teaching and when students become their own teachers*’.

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National Education Policy–2020 Recommendations on Research in India: Issues and Challenges

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Research is one of the most demanded areas in different sectors across the world; and as the different perspectives at the national and global level are becoming more and more intermixing with the technological advancements, the multidisciplinary, and interdisciplinary disciplines are growing in them. So, based on the present and upcoming technological changes and advancements, India should take advanced initiatives to compete in the global market in the future. National Education Policy–2020 (NEP recommended Multidisciplinary Education and Research Universities (MERUs), discontinuing M.Phil. programme, developing different designs of Bachelor and Master’s programmes along with research initiatives, different pedagogical approaches in different subjects with research provisions, establishing a National Research Foundation (NRF) to strongly monitor and fund different researches in India, etc. The authors discussed the recommendations of NEP 2020 with respect to research and provided a few suggestions including one cyclic model for NRF, writing of theses in Indian languages, consultations with eminent research experts, and other important concerns.

National Education Policy 2020 has been published with great hope and vision for revolutionising the education system in India. The document states that the world is undergoing rapid changes in the knowledge landscape, while with various scientific and technological advancements, the need for various skilled workforce across the sciences, social sciences, and humanities, will be increasingly in greater demand (NEP 2020, p. 2). The changes call for collaborative research for multidisciplinary learning and challenges as well. There will be a growing demand for tremendous

research in India, as India moves toward becoming a developed country as well as among the three largest economies in the world (NEP–2020, p. 2). Tilak (2018) states that “education faces umpteen challenges in the rapidly changing socio-economic and political global and national environments, calling for a sound public policy, while the formulation of sound and thoughtful education policy will depend upon the availability of robust research evidence on a variety of issues” (p. viii).

Bhushan (2019) enlightened, “The future of higher education needs to be directed towards the development of human capabilities” (p. 16). The current research agenda should help us to understand more and more the micro-level changes with the association of understanding the shift of the socio-economic structure (p. v). “The challenge of Indian universities is to achieve quality and excellence to match universities of high rank in the world. This means there should be high-quality research” (p. 3). “The national expectation will be equity and inclusion, whereas the global expectation may be the focus on research and reputation. This will radically shift the agenda of the future of universities in favour of research, mainly applied research” (p. 9).

On the other hand, Panigrahi (2017) specified, ‘With the growing importance of knowledge in the growth process higher education assumes critical importance in policy making’ (p.2). ‘Higher education plays an important role in knowledge production through its Research & Development’ (p. 2).

According to the experts and policy documents, in this contemporary age, the need for robust research with firm policy in all the sectors in India is extremely essential not only in Science, Technology, Economics, and Medical, but also in Humanities, Social Science, Agriculture, Education, and Art. For future generations and sustainable development with the competition in the global market, its need and importance are essential. NEP–2020 emphasized ‘outstanding research as a corequisite for outstanding education and development’ as its one of the

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fundamental principles to guide both the education system at large, as well as the individual institutions within it (p. 5). Even the document suggested several times to update and modify different areas of the education system based on the latest research (NEP 2020, p. 7, p. 9, p. 13, p. 19, p. 25, p. 27 & p. 56).

NEP–2020 recommended different perspectives of research in India including Multidisciplinary Education and Research Universities (MERUs), discontinuing M.Phil. programme, developing different designs of Bachelor and Master’s programmes along with research initiatives, different pedagogical approaches in different subjects with research provisions, establishing of a National Research Foundation (NRF) to strongly monitor and fund different researches in India, etc. Regarding the recommendations, the issues and challenges have been attempted to explore and discuss with logical support, review studies, and critiques. Also, the authors developed a few suggestions from a few perspectives of them. The analysis with discussion is presented here.

MERUs and Research Programmes

NEP–2020 proposed that model public universities for holistic and multidisciplinary education, at par with IITs, IIMs, etc., called Multidisciplinary Education and Research Universities (MERUs) will be set up and will aim to attain the highest global standards in quality education. They will also help to set the highest standards for multidisciplinary education across India (p. 38). Due to the essence of high-standard research at present and future, the initiative is sound, but the overgrowing fees in Research Institutions and Universities for Ph.D. and other programmes are appalling. NEP 2020 did not recommend appointing a single committee to recover the problem envisioning minimal fees. Tilak (2007) remarked that “UGC does not care to note that the current levels of fees in not only private institutions but also in public institutions are already high, rates of cost recovery have reached very high saturation levels in several universities, higher than the levels recommended by some committees in the recent past (such as CUBE 2005b) and that any further increase in fee levels will go against the goals relating to inclusiveness. There is no absolutely effective mechanism for regulating the fee structure in public and private institutions. Universities also

find it convenient to raise more and more resources by introducing self-financing courses of all kinds, some of which may even go against the very purpose of these universities. All these create hurdles in improving equity in the system” (p. 232).

NEP–2020 advised discontinuing the M.Phil. programme (p. 38). Although, especially in Social Science, M.Phil. programme develops good foundational skills among the scholars, it helps in understanding and expertise, for the scholars, to work properly further in their Ph.D. To offer different designs of Master’s programmes NEP 2020 visioned that HEIs will have flexibility including (a) there may be a two-year programme with the second year devoted entirely to research for those who have completed the three-year Bachelor’s programme; (b) for students completing a four-year Bachelor’s programme with Research, there could be a one-year Master’s programme; and (c) there may be an integrated five-year Bachelor’s/Master’s programme (p. 38). The initiatives are admirable compared with educational contexts across the globe, but contradictory in Indian context; because there is difference between the knowledge of Empirical Science, and Arts, Social Science & Humanities; in Social Science & Humanities, the foundation of knowledge should be enriched first, then the students can do research works, otherwise in the name of research the students (between the age group of 20 to 22/23 years) may lose the opportunity to acquire in-depth knowledge, which may hamper also in further studies in Ph.D., Post Doc., etc. Effective domain dominated non-empirical complexity nature in Social Science research must expect good foundation and maturity (Liang, Bac, Mao & Li, 2023).

National Research Foundation (NRF)

To catalyse quality research in the nation, NEP 2020 envisions the establishment of a National Research Foundation (NRF). The Foundation will competitively fund research in all disciplines, through the Institution successful research will be recognized, and where relevant, implemented through close linkages with governmental agencies as well as with industry and private/philanthropic organizations. Institutions that currently fund research at different levels will continue funding according to their needs. The Foundation, nature in Govt. will be governed independently, by a rotating Board of Governors consisting of very

best researchers and innovators across fields (p. 46). The NRF model for research already is available and working in South Africa, Singapore, Korea, and other different countries. National Research Foundation Act, 1998 (Act 23 of 1998 as amended), South Africa states the functions of NRF as supporting, promoting and advancing research and human capacity development (HCD), through funding and the provision of the necessary research infrastructure to facilitate the creation of knowledge, innovation and development in all fields of Science and Technology, including Humanities, Social Sciences and indigenous knowledge (NRF Strategy 2022-2025, 2022). The Republic of South Africa (2019-2024, Medium Term Strategic Framework; National Development Plan) envisions that NRF will work hard to transform the equity profiles of the South African research workforce; for knowledge enterprise; and to develop the relationship between science and society while building a diverse and fully inclusive learning organisation (NRF Vision 2030, 2022). The mission of National Research Foundation of Korea is to contribute to the advancement of knowledge and improvement of quality of life through supporting creative research and fostering human resources. The Foundation envisions working as a global leader to sustain a healthy research ecosystem. It applies the strategies consisting of innovating users, intensifying the role as a platform for knowledge creation, nurturing talents for the future society, maximizing the socio-economic impacts of research achievements, and strengthening the capacity for innovation (National Research Foundation of Korea, 2019). So, broadly, the vision of NRF is not only funding for the research programmes; but also towards creation of knowledge, innovation, and development in all fields of Science and Technology, Humanities, Social Sciences, and indigenous knowledge; developing the relationship between science and society; building a diverse and fully inclusive learning organisation; nurturing talents for the future society, maximizing socio-economic impacts of research achievements, and strengthening the capacity for origination. Therefore, along with funding, NRF in India should have simultaneously different complementary collaborative programmes aiming at the other responsibilities.

In addition, the authors suggest one cyclic model for the sound function of NRF. The outline

is as follows: (i) First, all India-based research with the collaboration of universities, other HEIs, and different organizations can be conducted to search the research problems, through the combination of different research methodologies. The combined methodology may include evaluative research, survey research qualitative and quantitative, descriptive research, documentary analysis, case studies, ethnographic studies, phenomenology, policy research, economic research, historical research, philosophical research, and other different methodologies to triangulate and capture the best result for the very purpose. (ii) Then, the research problems through the above process can be explored, and systematically the problems can be listed and documented. (iii) Then, the research problems can be distributed to the universities and other HEIs to conduct research on the problems, with the help of one board or multiple boards of experts. Here experts' appointment is crucial because in a lot of specialized areas dealing can be properly handled by the efficient experts only. The selection of experts is vital, and NEP 2020 too emphasizes this. (iv) Then, the next step is appointing researchers or selected research scholars to conduct research on the received research problems in HEI/s, although there should be flexibility in the action. The HEI/s can appoint researchers on the received research problems in the form of projects, etc.; as well as the selected scholars for Ph.D., Post Doc., etc. can be appointed for the received problems as their doctoral or post-doctoral problem. Although for the research scholars should have the freedom to select any other relevant research problem. Sometimes the research scholars face trouble finding relevant research problems, and the suggested methodology can be helpful to catch relevant problem/s. (v) Finally, on the outcomes of the model, follow-up action can be conducted. Based on the result of the follow-up action again the first step can be initiated. (vi) Cyclically the whole process can be carried out yearly or 2-yearly and after a certain extent of duration, the procedure can be dealt with based on technical convenience. Furthermore, different countries can utilize the model collaboratively. Through the model good researchers can be searched and appointed, good and relevant research problems can be selected and researched, capital and resources can be saved from wastage and can be utilized effectively, and development and economy can be moved forward.

So, in the future NRF may take the form of a research institute and of a university gradually where the fellows can work in different research programmes and research projects, and endeavor can endure NRF energetic and active. Also, the NRF of India may collaborate with the Research Foundations of other countries for cooperative work and better performance.

Indian Languages and Thesis Writing

It is an issue that although the Indian languages are superior and enriched, even though many of them are advanced in different aspects than English, they do not get enough place and honour to be utilized as a written language in the thesis in research. In the central HEIs, either English or Hindi is recognized, why not the other Indian languages, especially the languages which are recognized in the Constitution of India? Especially the matter of Social Science, Humanities, and Liberal Arts Research where innovation, novelty, creativities, and creation are interrelated extensively with the languages and culture concerned. But, yes, there is a practical problem, is that if the supervisors and the administration are not familiar with different Indian language/s, the way out is that a proper policy can be created in this way that the scholar who will be interested to do research/ writing thesis in any Indian language except Hindi, his/ her co-supervisor should be familiar in that Indian language, and the co-supervisor can be selected from any HEI in India conveniently. These kinds of policies can facilitate opportunities to produce a rich thesis in Indian languages, as well as also it is a big exposure to multidisciplinary features in higher education. Later on, the theses can be translated into English, Hindi, and other different languages for their wider spread across the globe, and through that translation, the industry may flourish also.

In-depth research and mother tongue, the language close to the mother tongue, is highly correlated, especially in Social Science, Humanities, and Liberal Arts; imposing research in either Hindi or English means losing continuously human resources, and their talents and creativities. The authors infer that the above issue is one of the major reasons for the backwardness and inferiority of Research in Social Science, Humanities, and Liberal Arts in India, where in-depth thinking processes, precise linguistic expertise, novelty, and creativity dominate a lot.

After enormous appreciation of Indian languages and mother tongue by NEP 2020, Sengupta (2021) interpreted that in India the agenda of inclusion and accessibility through mother tongue including the Indian languages aimed at reducing inequality and discrimination is not only far to be implemented but seems to remain an unfulfilled dream in the foreseeable future (pp. 45-52). In their study, Amano, Gonza'lez-Varo, and Sutherland (2016) presented that language barriers can cause gaps in the information available during the global compilation of scientific knowledge, as scientific information is available not only in English but also in many other languages. Ignoring non-English may and can cause biases and gaps in our understanding of the global environment. Another type of bias, of particular relevance to environmental studies, is that information on species, habitats, ecosystems, and phenomena that are specific to countries where English is not the mother tongue can be overlooked when searched only in English (pp. 2-4).

Regarding Indian languages, culture, and research, NEP2020 recommendation is also important here. The document visioned that all languages in India, and their associated arts and culture will be documented through a web-based platform/portal/wiki, in order to preserve endangered and all Indian languages and their associated rich local arts and culture. Universities and their research teams will work with each other and with communities across the country towards enriching such platforms. These efforts and the associated research projects will be funded by NRF (p. 56). The vision may open the further opportunity to the Indian languages with their culture to be flourished in different areas of research.

Pedagogical Approaches

NEP-2020 states that "it is recognized that there are several pedagogical approaches internationally for teaching a particular subject, and NCERT will study, research, document, and compile the varied international pedagogical approaches for teaching different subjects and make recommendations on what can be assimilated from these approaches into the pedagogies being practiced in India" (p. 24). With NCERT, other monitoring agencies of Teacher Education, such as NIEPA, Teacher Education Universities, SCERTs, and also CBSE can be aligned to work in this vision on par with a few global institutions and organizations.

Curtin & Hall (2018) states that while research approaches to pedagogy are vastly more sophisticated now given various developments in understanding pedagogy itself, learning and childhood/personhood, and indeed technology, is that the field of pedagogic methodological research is still relatively new and merits exploration and analysis in its own right (p. 371).

Other Different Issues and Areas Emphasized

NEP 2020 not only recommended and discussed on the above concerns regarding research, but also it emphasized on the application/ utilization of the findings of research studies in Early Childhood Care and Education (ECCE), for Foundation Literacy and Numeracy, learning optimization, curriculum and pedagogy in schools, multilingualism and the power of language, transforming assessment for student development, equitable and inclusive education, and so on, for updating and moderation of them (p. 7, p. 9, p. 13, p. 19 & p. 25). Research and innovation have been stressed for professional education, technology use and integration, online/digital education, function of National Educational Technology Forum (NETF) (p. 27 & p. 56), and other different areas covering almost each and every aspect of education directly or indirectly.

Discussion and Conclusion

A broad range of actions with long-term planning can make education policy more growth-friendly and pro-inclusiveness (OECD, 2014, p. 12). Pursuing decentralisation, developing new forms of collaborative and participatory governance, and using new technologies with open data and transparency can help government/s to actively engage with stakeholders and foster more effective policy design and implementation (OECD, 2014, p. 2). A strong partnership is critical to advance global operational knowledge, best practices, learning, and leveraging financial support (The World Bank, 2021, p. 10).

Elsun (2013) stated that there is the inevitability of imperfection in the development of integrative applied research. A corollary of a high ratio of unknowns to knowns is a high level of uncertainty in social research, a problem in the public, needs to utilize a decision-making style appropriate (p. 434). He further stated that “Research on complex real-

world problems is a complex social process, and in this context in the great majority, ‘have’ neglected the people and social dimension; values remain part of this, however, the issue of people and social dimension is much broader than the values. The ‘messiness’ of the process is similar to radical innovation, which is unpredictable, sporadic, nonlinear, stochastic, and context-dependent (history, experience, culture, personalities, and informal relations all matter). One particular difficulty is people’s desire to impose order on an inherently chaotic process to construct and try to adhere to a structured plan with predetermined milestones” (Elsun, 2013, p. 436). Bammer, G. (2013) interpreted that providing integrated research support for policy and practice change is constrained both by the absence of knowledge synthesis and by the limited approach to unknowns (p. 214). So, social research and its aspects are sophisticated and many cases abstract in nature without expecting predetermined milestones as usual, for a high ratio of unknowns to knowns, and due to the absence of knowledge synthesis. They seek dedicated research and researchers; seek research not only job-oriented but also research for the research’s sake.

From the above discussion, we can comprehend that NEP 2020 recommended many initiatives for research and its progression in India. It recommended Multidisciplinary Education and Research Universities (MERUs) but for the very purpose research environment should be inclusive, as well as different fees in the programmes should be affordable for all. NEP 2020 suggested offering different designs of Master’s programmes with research initiatives, yet the effective domain-dominated non-empirical sophisticated nature in Art & Social Science Research expects a good foundation and maturity. The policy document envisions the establishment of a National Research Foundation (NRF); in addition, one cyclic model has been suggested for the sound function of NRF. Policies to utilise Indian languages in thesis writing can facilitate the exposure to produce a rich thesis, as well as towards multidisciplinary features in higher education. With NCERT, other monitoring agencies of Teacher Education can be aligned to pedagogical research on par with different global organizations. NEP–2020 emphasized utilizing the findings of research studies in different areas of education for updating and moderating them. Research and innovation have been stressed also.

Broad-range long-term planning is emphasized for growth-friendly and pro-inclusiveness. The essential integrated research for policy and practice change in India seeks knowledge synthesis, further seeking dedicated research.

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Need for Smart Technologies in Quality Affordable Healthcare

V Kamakoti, Director, Indian Institute of Technology Madras delivered the Convocation Address at the 34th Convocation Ceremony of Sri Ramachandra Institute of Higher Education and Research (Deemed to be University) Porur, Chennai on October 08, 2022. He said, "There are certain critical needs for our country and we need to rise up to this occasion and work in those fields and really bring up the country to that stage and that is all with youngsters like you who are graduating now 25 years later you may be the Vice Chancellor of this august organization, thus the whole country relies upon your contribution and that is one very important convocation message that I want to deliver to all of you." Excerpts

I am very happy to be here. When I was doing my under graduation at Venkateswara college I stay in Alwarpet and I used to pass through this campus every day because our college was there in Naserathpet so I have been witnessing this particular institution right from its scratch. First there was a temple that came up and then one building and from there today it's a great growth. I wish the management a very very big congratulation for bringing in such a great institution with nearly 2000 students admission annually and nearly 3000 patients seeking healthcare on the annual report being presented as a gist. This foot fall is phenomenal. Today as we are moving towards our 100 years of independence in the next 25 years there is an imminent need that we all really strive very hard to make medicine and related consumables, devices, implants and other further treatment prosthesis in the control of our nation. There is a need for us to reduce the inputs and reduce the dependency on foreign technology and make lot of things here within us so that we address one of the most important need for the country, need for every citizen health care with full confidence and full control. Today, what COVID has taught us I repeat this example in every meeting or every convocation address that I have been delivering in the recent past and being a medical institution it is my duty to do here too. When the west invented a vaccine and found that it was working at 80 degree centigrade they stopped further development because it suited their need. If we are dependent upon the vaccine like it would not have suited our requirement and we would have fallen back in our immunization programme.

We as a country rose up to that expectation and not just developed one vaccine, but 2 vaccines that

will work at this humid, hot at the same time cold, wet different environmental condition of our country. Delivered the vaccine to 140 crore people, not one or two, and today we are standing with confidence fighting this pandemic not only that we exported, we donated this to the other needy countries and that is what makes Bharat a proud country. The recently concluded JEE exam and when we look at the preferences of the top 1000 people they are the cream of our country, I did put this question what made us, of which discipline actually made us you know to this date today. When we look at the IIT Madras the discipline that had enabled us today to come on top with confidence in biological sciences. That if we look at the choice made by the students the biological sciences is the last choice that is a usual contradiction in which we are. There are certain critical needs for our country and we need to rise up to this occasion and work in those fields and really bring up the country to that stage and that is all with youngsters like you who are graduating now 25 years later you may be the vice chancellor of this august organization, thus the whole country relies upon your contribution and that is one very important convocation message that I want to deliver to all of you.

Today's technology and medicine are coming together. I was very happy when Sri Ramachandra College which is well known for the medicine component has opened up an engineering college also. It is very important today if you look at many of the cause effect relationship, for example sugar causes diabetes, smoking causes cancer, drinking spoils the liver. All these cause effect relationship has been found by Engineers working closely with doctors. Our engineers who know medicine

or medical doctors who know about engineering so there is a very important intersection between engineering and medicine and that is going to be very important for us to specialize upon so that we take our country to the next stage of quality healthcare.

If you look at the Nobel Laureates 37% of the Nobel Laureates are physician scientists who have understood both medicine and engineering. I take this opportunity to request all the doctors, whether they are MBBS or dental or MS or other post-graduates to have a sort of deep introduction into understanding the engineering of the human body to understand the engineering of the different devices that they are using not just as a user but to go and understand the deep principles based on which these devices work. When India was struggling for ventilators we did come up with indigenous ventilators to solve the problem in the covid times and that required a strong interaction between engineering and medicine. One very important thing that is coming up today is lot of data accumulation in Health Sciences you see as I came here a couple of weeks or one month before. Every device that is there in your ICU or in your other consultation including OPD there is a digitization that is involved there, the data being collected so there is lot of data that is available within our country. Our country is going to be the gold mine for health related data and we need to understand as doctors there is a need for you to understand this data, how to interpret the data and how to make some reasonable conclusions which can guide you fairly in the health care of our country. So in this context I also make this appeal to all the young doctors here who are going to graduate today that you spend some time in understanding data science. Do some foundation course or some diploma or even a degree course in data science. The UGC, the University Grants Commission has come up with, in my opinion an historic order it says that you can take 2 degrees at the same time. For the current MBBS students who are in this college can basically take up a data science diploma or a data science foundation course, either in the engineering college or today there are many online resources that are available and specialize in the area of data science and that is going to be extremely important for you to make any further strong research in the area. This is what the western world today are following. We have a

unique advantage that we as a country set on tons and tons of data generated on a daily basis. With the footfall that you see at Ramachandra I think this is going to be a massive data collection and data massaging that you can take which can really bring in lot of state of the art research and state of the art development as a part of this entire medical and engineering Journey.

Friends, there is also an imminent need for developing certain policies for the country and quick development of certain treatment protocols. Today in the event of covid we did see other Indian schools of medicine including siddha developed certain treatment protocols which on an individual basis we did find it extremely effective but at the same time to get international acceptance of this protocol who make it as a you know a treatment process there are lot of hurdles and sometimes it has become impossible. The reason is that everything today needs a scientific basis fortunately or unfortunately. There are certain principles on which medicine as a theory has evolved for example randomized control trial. Right, when you look at the randomized control trial for a problem it looks absolutely idiotic. The simple reason is we are, say 3 different ways of treatment and when we start doing a randomized control trial on one wing or one arm we see very prominent results. That the remaining two arms they are saying that the patients are dying, but still the randomized control trial today impose that we continue that other treatment and not the successful one. Sometimes we find it against ethics, right, to establish a Indian school of medicine treatment process in the international community, the acceptance is quite meager especially from the external world. And this scenario has to change. The Ayurveda, the unani and the siddha has demonstrated today in the COVID era. Others is certain fundamental issues in our health, boost our immunity, that treating a disease it makes our body resist that disease and these things have to be established scientifically and I am sure all of you doctors may take this as a side hobby even as a hobby to look at our Indian medical system and see how we can make a very sensible contribution from this end, specifically not only interms of treatment process, but also we should start looking at publishing and patenting some of our earlier techniques and Indian products. I am sure down the line with the type of diseases that we are facing, type

of pandemic that we faced and new viruses and the variants coming up, the Indian School of Medicine which tries to address the root of the problem and concluded that boosting our immunity is important. We have a bigger say in the global world and for making it possible it is all in the hands of you young doctors to take it forward. Last but not the least, I also try to emphasize the point that we start looking very deeply into the medical devices. There are sfi many devices that you look very simple ones wherein which are imported at the premier cost, unimaginable profit for the foreign companies for the simple reason that they are qualified and they are working efficiently. When you actually look at many of these devices, or the equipment it will not even one by 50⁺ cost that we pay. Here professors will certify that there is no concept of negotiation when it comes to import they just go and pay the price and get it. I think this is a very important point which will make quality health care not accessible to poor people. We need to democratize treatment process and the way we democratize is to provide this quality health care at a reasonable cost to the needy to the poorest of the poor and for this reason we need to develop indigenous devices and this requires a very close interaction between the engineering fraternity and the medical fraternity. Engineering and medicine have to come

together and I request all the doctors to actually look for friends among your batch mates etc who have taken engineering and start at least debating on how to make devices. If you find a device in a particular laboratory try to see what it means to make it India. I think this thought process itself is extremely important so that we move forward as a country and if all of you start thinking at least we will try to replace 20% or 30% annual imports that we do both in the area of consumables and also devices and implants from the western world and from the other parts of the world. As we approached 100 years of independence we need, we got social independence in 1947 a political independence, we need technological independence, we need medical independence and that is what will make our country very prosperous and I am sure all of you will put in your great efforts in this direction and make our country a very highly healthy country making quality affordable healthcare to help the poor and the poorest of the poor. With this very noble thoughts I would like to thank your management of Ramachandra and all of you for inviting me to this convocation. It is a pleasure to meet you and hope we will all meet again when there is a technology interface.

! JAI HIND !

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AIU Publication

on

REIMAGINING INDIAN UNIVERSITIES

‘Reimagining Indian Universities’ edited by Dr. (Mrs) Pankaj Mittal and Dr S Rama Devi Pani is a collection of essays by some of the greatest thinkers in the field of Indian higher education. Each essay in the book examines one or more of the critical topics and provides solutions and methods to overcome the issues involved in them. It provides new solutions and methods in the form of reforms and innovations to elevate Indian universities to world-class top-ranking levels. The book aims at providing a roadmap to government as well as the universities to gear themselves towards becoming more responsive to the present and future demands of higher education. Generating a corpus of new ideas that are significant for reimagining, reforming and rejuvenating Indian higher education system, Book is ‘must read’ for all those who are interested in reforming Indian Higher Education System.

The release of the book in the Annual Meet of Vice Chancellors 2020, coincides with the launch of New Education Policy. The Foreword for the Book was written by the then Minister of Education Shri Ramesh Pokhriyal ‘Nishank’.

PP: 372, Unpriced. Available at AIU Website: www.aiu.ac.in

Summer School on Climate Change and Role of Ocean

The Summer School on 'Climate Change and Role of Ocean' was organized online by the Global Science Academy (GSA), Basti, Uttar Pradesh to commemorate World Environment Day (June 05, 2023 *#BeatPlasticPollution*) and World Ocean Day (June 08, 2023). It was designed to educate and prepare participants with a background of aspirations for World Environment Day and World Ocean Day themes of the year 2023 in order to tackle major climate problems including hazards of plastic pollution and to provide scientific solutions as well as raising sentience on the significance of ocean in mitigating climate change by using the knowledge gained by the engaging involvement. Besides, participants further showcased with a particular focus on United Nations' (UN) Sustainable Development Goal (SDG)-14 i.e. Life Below Water and SDG13 i.e. Climate Action. The course had further vitrine SDG17 i.e. Partnerships while, at all times, reflecting upon how all SDGs are entrenched and interlinked within the Agenda 2030 of UN. In India, it was enthusiastically attended by students of the Global Science Academy, Science Brigade of India.

The summer school was joined by students, learners as well as some of the professionals of eminence wherein the importance of the ocean and ways and means to beat plastic pollution were discussed in detail. Besides Indian participants, Climate Smart Community Task Force Member, Ms. Paula Wildermuth, New York (USA), Mr. Nicholas Whall, Ocean Warrior New Zealand, Oceanography, student, Mr. Lavio Jorge, Mozambique showed their interest in the summer school. Hydrobiologist since 1968, Ms. Vera Kochetova, Vladivostok, Russia talked about the interaction of air-atmosphere streams in the North Pacific beginning from Hawaii.

During the slide presentation, Founder Director, Global Science Academy's shared that this year, World Environment Day (WED) marked its 50th Anniversary and the theme was 'Solutions to Plastic Pollution' (hashtag *#BeatPlasticPollution*). He delineated that more than 400 million tons of plastic are produced every year worldwide, half

of which was designed to be used only once. He lamented on an assessment that less than 10 per cent of plastic is recycled and an estimated 19-23 million tons end up in lakes, rivers and seas annually. Further, microplastics tiny plastic particles up to 5mm in diameter – find their way into food, water, and air. Thus, discarded or burnt single-use plastic harms human health and biodiversity and pollutes every ecosystem from mountain tops to the ocean floor. In line with UN agencies and others, he requested you all to join hands in such a drive not only in the commemoration of these days of World Environment Day as well as World Ocean Day but beyond the observations as well. Furthermore, it had also been pooled that in order to focus on the importance of the ocean and the need to protect it, observances of World Ocean Day (June 08, 2023) being held around the theme, 'Planet Ocean: Tides are Changing', to create a newer wave of anticipation towards apprizing and protecting the ocean and the wholeness of our blue planet.

In the summer school participants through interactive sessions got an invaluable amount of thoughtful knowledge and experts explained that Ocean cherishes incredible biodiversity i.e. around 80% of all life forms reside here. Also being an imperative source of sustenance and livelihood because it produces food, mineral and energy for life as essential not only for survival but for being flourished as well. Due to ever increasing demand for food in the current pandemic of coronavirus, the ocean is optimistic. The livelihood and lives of more than 3 billion people highly rely on marine and coastal biodiversity. Since ocean not only absorbs large amounts (around 25%) of anthropogenic Carbon Dioxide (CO₂) but also produces more than 50 per cent of the essential oxygen. Minute ocean flora i.e. phytoplankton, mostly exist near the surface of the water and drift with its currents, contribute 50 to 85 per cent of the oxygen in the Earth's atmosphere. Using carbon dioxide and sunlight to make their food during photosynthesis, these phytoplankton generate oxygen, as a byproduct, which is essential for animals' breath including human beings. Ocean not only absorbs CO₂ emissions but also captures around 90 per cent of the heat generated from these emissions and safeguards the planet against the

brunt of climate change; thereby helping in placating SDG-13 as well.

Specialists further highlighted that in the meetings of the United Nations Framework Convention on Climate Change (UNFCCC), to achieve the objectives of the 14th Sustainable Development Goal i.e. 'Life Below Water, ocean issues incorporated into the 'NDCs' and 'National Adaptation Plans (NAPs)' by the Member States and in August 2015, 193 countries had appropriately agreed on this. Also, the period from 2021 to 2030 was declared in the 72nd session of the United Nations General Assembly (UNGA) as 'UN Decade of Ocean Science for Sustainable Development' more particularly to achieve Sustainable Development Goal (SDG)-14 in order to conserve and sustainably use oceans, seas as well as marine resources. More than 3/4th of the biodiversity exists in the ocean. It has been said in the event that coastal regions were specifically important both because of livelihood and other economic activities including tourism and transportation. Also, the global ocean economic activity, per annum, was estimated between US\$ 3 trillion to US\$ 6 trillion contributing to the world economy i.e. 'blue economy'. On the other hand, pollution, ocean-acidification, climate change, etc. are creating turmoil in marine biochemistry and losses in its biodiversity, apprehending food and human welfare on the whole.

During the summer school, it was narrated that United Nations Inter-governmental Panel on Climate Change backed mitigation as reducing climate change by reducing the flow of heat-trapping greenhouse gases into the atmosphere, either by reducing sources of these gases or enhancing the 'sinks' that accumulate and store these gases e.g. oceans, forests, and soil. The ultimate aim was to stabilize greenhouse gas levels in a timeframe ample to allow ecosystems to adapt naturally to climate change, ensure that food production is not threatened, and enable economic development to proceed in a sustainable manner. In addition, adaptation i.e. adapting to life in a changing climate involves adjusting to actual or expected future climate. Here, the goal was to reduce risks from the harmful effects of climate change e.g. sea-level rise, extreme weather events, or food insecurity etc.

Thus, the summer school went successfully and all the participants were issued with a participation certificate'. The vote of thanks was proposed by Dr.

Anil Pratap Singh, Founder Director and the General Secretary of GSA.

International Conference on Migration and Sustainable Development

A two-day International Conference on 'Migration and Sustainable Development: Opportunities, Challenges and the Way Forward' is being jointly organized by the Centre for Labour Studies and Practices, Tata Institute of Social Sciences (TISS) Mumbai, Maharashtra and International Institute of Migration and Development (IIMAD) Thiruvananthapuram, Kerala during December 15-16, 2023. Academicians, practitioners, and policy experts, etc. may participate in the event. It will aid in the consolidation of research findings pertaining to many newly developing viewpoints and policies on Migration and Diaspora, giving better insights into the link between migration, diaspora, home country, host country, and transnational and their role in achieving sustainable development goals 2030. The event will cover both theoretical and practical topics in order to provide a comprehensive understanding of the theme. The tentative Subthemes of the event are:

- Migration and Sustainable Development Goals.
- Migration and Green Economy.
- Return Migration and Sustainable Reintegration.
- Invisible and Undocumented Workers.
- History of Migration.
- Migration and Development Strategies at National and International Level.
- International Labour Standards and Conventions.
- Diaspora, Remittances, and Development Migration and Global Culture.
- Politics, Racism, Citizenship.
- Gender and Migration.
- Methods and Data in Migration Studies.
- Any Other Relevant Theme.

For further details, contact Organisers, Dr. Irudya S Rajan, Chair, International Institute of Migration and Development (IIMAD), Thiruvananthapuram, Kerala and Dr. Ruchi Singh, Assistant Professor, Centre for Labour Studies and Practices School of Management and Labour Studies Tata Institute of Social Sciences (TISS), Mumbai. E-mail: info@iimad.org. For updates, log on to: www.iimad.org

International Conference on Advances in Minerals, Metals, Materials, Manufacturing and Modelling-2023

A two-day International Conference on 'Advances in Minerals, Metals, Materials, Manufacturing and Modelling-2023' is being organized by the Department of Metallurgical and Materials Engineering, National Institute of Technology Warangal, Telangana State in association with IIM Hyderabad Chapter during September 22-23, 2023. The purpose of the conference is to provide a platform for academicians, scholars, researchers, and industry personnel from all around the globe to discuss and disseminate the knowledge created in minerals processing, materials development, materials degradation, and computational materials modeling. The event is structured around several thematically focused sessions during which participants present their work and discuss the advances and challenges in these thematic areas. The Topics of the event are:

- Advances in mineral processing;
- Advances in iron and steel making;
- Special steels and alloys;

- High-temperature materials;
- Nanomaterials and nanostructured materials;
- Corrosion and oxidation;
- Creep, fatigue, and creep-fatigue interaction;
- Surface engineering;
- Powder metallurgy;
- Advances in manufacturing;
- Advances in aerospace materials;
- Thermomechanical processing;
- Welding/Joining;
- Advanced ceramics/Composites/Polymers;
- Additive manufacturing;
- Light alloys/Energy materials/Bio-materials; and
- Computational materials science/Process modeling.

For further details, contact Convener, Metallurgical and Materials Engineering Department, National Institute of Technology, Warangal- 506 004, Telangana State, Mobile: +91 8106933877, +91 9866310178 E-mail: icam5@nitw.ac.in. For updates, log on to: <http://cms.nitw.ac.in/conference/icam2023/>

AIU News

Welcome To Prof G D Sharma: The New President AIU (2023-24)

Prof Gauri Dutt Sharma, Vice Chancellor, University of Science and Technology Meghalaya has taken over as the New President of the Association of Indian Universities (AIU), New Delhi on July 01, 2023. A leading educationist, eminent scholar, reputed life scientist, and well-known academic administrator, Prof Sharma is the seniormost Vice Chancellor in the Country and 102nd President of the AIU.

A world-renowned Life Scientist, Prof Sharma dedicated his career of nearly 45 years to serving Central Universities of the North Eastern states viz the North Eastern Hill University (Meghalaya), Mizoram University, Nagaland University, NERIST, Arunachal Pradesh and Assam University as Head and Dean, Life Sciences. He served as Pro Vice Chancellor and Vice Chancellor of Nagaland Central University. Pro Vice Chancellor of Assam University

Silchar. He served as the Founder Vice Chancellor Atal Bihari Vajpayee University Bilaspur University, Chhattisgarh since 2012 prior to taking over as Vice Chancellor of USTM Meghalaya.

As captain of the Indian Higher Education System in the Northeastern States, Prof Sharma has significantly contributed to the human resource development in the tribal states besides promoting serious research and extension activities. He has also contributed a lot to the understanding of the culture, values and philosophy of the great Indian nation through education and created love and belongingness among the tribal people of North Eastern India.

During his tenure as Vice Chancellor the Nagaland University, he was deputed by the Ministry of External Affairs to Myanmar (Rangoon University in 2005) to uplift the higher education standard. His understanding of the neighbouring countries like Bhutan, Myanmar and Bangladesh, grew through the

interactions with intellectuals, delegates, students and people of these countries, which helped in strengthening India's educational, socio-political and economic ties and linkages. He has been delivering messages to the people on human values for peace and progress, human rights and security, and above all dignity of an individual.

As a Founder Vice Chancellor of Bilaspur University in Chattisgarh State, Prof Sharma has made significant contributions to quality enhancements of Higher Education during his two terms. Besides this, he has made successful endeavours to understand and help the people of the central part of India particularly marginalized sections of the society like STs, SCs, OBCs and minorities. With his long exposure to the national and international socio-economic scenario, an understanding of the people and their progress could be a fast track of development and will keep pace with translating Look East Policy into a functional one albeit it is very slow at present. At the same time, he envisions a rapid development of Central and Northeast India with his master plan.

Prof Sharma has guided 60 research scholars for their Ph.D degrees, 5 M.Phil and 5 Post Doctoral Fellows. He has published over 362 research papers in National and International Journals of repute. He has edited/authored 13 books published by Indian and foreign publishers. Widely travelled, Prof Sharma has visited countries like USA, England, Canada, Japan, China, Malaysia, Myanmar, and Thailand for various academic activities and assignments.

A highly reputed academic and researcher, Prof Sharma has been given various awards like Birbal Sahni award by the Indian Botanical Society, the Best research paper award by Indian Phyto-pathological Society, the Higher Education Leadership Award by the International Society, DEEDS award by Federation of Indian Universities, UNESCO, Dr. S. Radhakrishnan Education Excellency Award in recognition of outstanding contribution in the field of Education conferred by Indian under the Ministry of Education, Government of India; honoured by Hon'ble Agriculture Minister of West Bengal Shri Sohan Deb Chattopadhyay, Diamond Leader Award of Asia awarded by International Organisers of Poland and Thailand, etc. Dr. Narsimhan Medal award by Indian Phytopathology Society in 1993 for best research Paper; Rashtriya Ratna Award by International Study Center 2003; DEED Award by

the Confederation of Indian Universities IAWEA Affiliated to UNESCO, 2004; Birbal Sahni Award By Indian Botanical Society 2010; S.K. Barua Memorial Lecture at Calcutta University 2009; CSIR Foundation Day Lecture at NEIST, Jorhat, 2009, Foundation Day Lecture, Dibrugarh University 2005, Education Excellence Award by CCLP Worldwide, Dec. 2010, Vidya Ratan National Samman, 2015 By All India Higher Research Sanskrit, Raebareli, Outstanding Educational contribution Award by CMAI, New Delhi 2015 at National Chhattisgarh Education Summit, Swami Vivekanand Excellence Award by International Institute of Oriental in March 2019, Indo-Asian Eminent Vice Chancellor Award, 2020. Vivek Jyoti Ananya Samman (Lifetime Achievement Award) awarded by Swami Vivekananda University, Kolkata, Also received the Thought Leadership Award awarded by Employability.life.

He has a Fellowship of the Academic Society from the Royal Society, London, UK & INSA, India under the exchange programme, a Fellow of the Indian Mycological Society, 2009 (FIMS), a Fellow of the Indian Botanical Society (FBS), Fellow of the International Natural Resource and Environment Society (FINRES). He was also associated as President of Non-Governmental Organization (NGO) like GREENS of Silchar, which was awarded First Prize in 2010-11 for its social contributions.

In the session 2022-23, he was the Vice President of AIU and has now joined as President AIU with a thorough understanding of the activities and functioning of AIU. He brings with him a bouquet of hope and enthusiasm for the AIU Fraternity.

The Association of Indian Universities welcomes him as its new President and is looking forward to gaining from his academic acumen, scholarship, and vast experience.

Refresher Course on Digital Skills and Competencies for Teachers

A two-week Online Refresher Course on 'Digital Skills and Competencies for Teachers: With Special Focus on MOOCs (Massive Open Online Courses) and E-Content Development' was jointly organised by the Association of Indian Universities, New Delhi and the Academic and Administrative Development Centre, Academic Staff College, Amity University Haryana during June 09-22, 2023.

The course was attended by one hundred and forty-six (146) registered participants from forty-two various universities, colleges, and institutions from across the country.

In her remarks, Dr. Sanjna Vij, Deputy Director, Academic Staff College, Amity University Haryana and Chief Organiser of the event emphasized that in today's rapidly changing world, digital skills have become essential in our daily lives. As educators, it is crucial for teachers to stay updated and equipped with the necessary tools and competencies to effectively navigate digital landscapes. Highlighting the importance of embracing digital skills, Dr. Vij quoted, "Illiterates of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn."

Prof Vikas Madhukar, Pro-Vice Chancellor, AUH, during his address, emphasized the need for modern educators to stay aligned with new technological advancements. Prof Madhukar mentioned the importance of incorporating the National Education Policy (NEP) into the academic curriculum. The NEP places particular emphasis on the SWAYAM MOOCs platform, which was created by the All India Council for Technical Education (AICTE) in 2016. Prof. Madhukar emphasized that by embracing these technologies and platforms, educators can create engaging learning experiences and cater to the diverse needs of students in the digital age.

Prof. P B Sharma, Vice Chancellor, Amity University Haryana delivered the Keynote Address and emphasized on creating a new-age learning environment within Indian universities. Prof Sharma highlighted the significance of events like this and stressed the need for utmost seriousness. Prof Sharma stated that such gatherings signify the eagerness and determination of the teaching community to prepare for the challenges ahead, particularly in the digital age. In this new age, it is crucial to actively contribute to establishing an educational environment that maximizes the potential of digital tools and technologies in the realm of teaching and learning. Prof. Sharma underlined the need for teachers to foster an environment that supports three key attributes: innovation, collaboration, and enterprising approach. Prof Sharma also stated the importance of generating new applied knowledge

and expressed delight in having esteemed resource persons present during the course.

Dr. Amrendra Pani, Joint Director and Head, Research Division, Association of Indian Universities, Delhi during his address emphasized the importance of AIU's objective to modernize digital education through the introduction of online activities for teachers, such as teaching, learning, and integrating technology into the research and revolution process of teaching and learning. He also addressed the misconception that blended learning is synonymous with video learning. He highlighted the prevailing bias towards traditional learning among teachers, with only a few embracing alternative approaches. His intention is to transform this mindset by advocating for the digitalization of teacher education and the widespread integration of technology in the education sector. He concluded his speech by expressing his strong desire to make significant contributions toward enriching and strengthening our country's digital education.

Dr. B Shadrach, Director, Commonwealth Educational Media Centre for Asia, Commonwealth of Learning, New Delhi emphasized the significance of understanding the learners and their individual learning styles for educators. During the presentation, Dr. Shadrach discussed the importance of teachers understanding the theoretical grounding of their teaching practices as well as their practical orientation. By having a strong theoretical foundation, teachers can design and deliver effective digital learning experiences for their students. Additionally, understanding the practical aspects of teaching allows teachers to align their digital skills and competencies with the needs of their students.

Dr. Brijju Thankachan, Executive Director, Educational Technology Society of India and Ex-Visiting Faculty, Educational Technology, IIT Bombay touched upon the paradigm shift in the education system and introduced the concept of the information age paradigm, which highlights the changing role of teachers from being mere information providers to becoming facilitators of information. Dr. Thankachan also emphasized that in the information age, teachers are no longer the sole repositories of knowledge. Instead, they play a crucial role in guiding students in accessing and critically analysing information. The focus has shifted toward

developing skills such as digital literacy, information evaluation, and problem-solving.

The Chief Guest, Prof. S N Sridhara, Vice Chancellor, Hindustan Institute of Technology and Science, Chennai in his presentation 'Revolutionising Education: The MOOCs' provided a comprehensive overview of MOOCs. He delved into the history of MOOCs, distinguishing between cMOOCs and xMOOCs. Furthermore, he discussed the development of MOOC companies in the United States, such as Udacity, Coursera, and edX, as well as those in Asia, including SWAYAM, NPTEL, and JMOOC, and Europe's FutureLearn, EduOpen, and MOOC.fi. The speaker also highlighted the success story of SWAYAM MOOCs and elucidated the requirements for creating MOOCs. He elaborated on the four quadrants of LMS, which encompassed aspects such as synchronous and asynchronous engagement, E-content, AI-assisted assessment, and peer learning. Additionally, he addressed the issue of attrition in MOOCs and provided insights into the underlying reasons for it.

The Vote of Thanks was proposed by Maj Gen (Dr) J S Dhull, VSM (Retd), Director, Amity Institute of Defence Technology and Deputy Director, ASET, AUH where he expressed his gratitude to all the dignitaries and participants.

In the first Plenary Session, Dr. Sophia Sandeep Gaikwad, Head of the Symbiosis Teaching Learning Resource Centre, Symbiosis International spoke about 'Digital Advance Literacy and Tools for Learning and Teaching'. She explained how revolution took place in the 21st century and how we are moving towards digitalization. She highlighted the skills and their importance in the 21st century which include-Learning and Innovation Skills, Digital Literacy Skills, and Career and Life Skills. She also discussed how Pedagogy is different from Antagogy and what are its key principles. She also discussed the role of technology and how it has transformed the way we live, work, communicate, and interact with the world around us. She summarized that with the right tools at our disposal, we can unlock the full potential of education, inspire lifelong learning, and prepare students for success in the ever-evolving 21st century world.

Dr. Meera Iyer, Amity Institute of Behavioural and Allied Sciences, Amity University Haryana

talked about the need for digital literacy of various ICT tools for employability, academic plagiarism, online etiquette, cyberbullying, etc. She also talked about how to make e-content interesting by showcasing it with the help of a demo created with Kreado AI. She also discussed multiple tools that can be used to create interesting e-content like Merge Cube, Nearpod VR, Prezi, Powtoon, Moodle, Miro, Edmodo, etc. She focused on the fact that online content needs to be engaging and must seem interesting to the participant as otherwise, the participant will lose interest in the course.

Ms. Subha Das Mollick, Independent Filmmaker, Visiting Faculty, Aliah University and Maulana Abul Kalam Azad University of Technology, West Bengal talked about the state of online courses being offered by various institutions and private organizations. As per research, not even 5% of the students enrolled for MOOC course, completes it. She shared that students lose interest with time in online courses and discussed the need to design interactive and interesting course material in order to keep the students actively engaged during the sessions. During the session, she shared various types of templates for designing course material for the MOOC courses. She also pinpointed the need for memes, storyboards, videos, interviews, podcasts, etc. to be included as a part of the MOOC course.

Dr Md Shuhel Miah, Deputy Dean, Brittany University, Malaysia focused on the utilization of digital content creation in the context of communication disorders. He emphasized the need to consider various impairments, including visual, hearing, and cognitive disabilities when designing content. The speaker discussed the SCULPT framework for content creation. It provides a systematic approach to developing accessible content, promoting clarity, organization, and effectiveness. He also addressed the process of converting PDF files to Word documents. Also, issues related to editor, customization, and adaptability of the content. Finally, the speaker concluded by highlighting the latest updates on research.

Prof. A K Verma, Department of Computer Science and Engineering, Thapar Institute of Engineering and Technology, Patiala addressed the audience about Bloom's Taxonomy. It is one of the widely used tools in the field of education to guide curriculum development, instructional design, and

assessment strategies. It is a hierarchical framework that categorizes educational objectives and cognitive skills necessary for effective learning and knowledge acquisition. Prof. Verma informed participants about the six levels of taxonomy which are Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation, arranged in ascending order of complexity, with each level building upon the previous one.

Dr Durgesh Tripathi, Associate Professor, University School of Mass Communication, Guru Gobind Singh Indraprastha University, Delhi gave an enriching talk on how education for all is possible and why teachers need to possess basic digital literacy skills, including proficiency in using computers, operating systems, and common software applications. He elaborated on the fact that teachers should be comfortable navigating the internet, conducting online research, and utilizing search engines effectively, as these skills form the foundation for teachers to explore more advanced digital competencies.

Prof. Uma Kanjilal, Pro-Vice Chancellor, Indira Gandhi National Open University, Maidan Garhi, New Delhi started the session with discussions on NEP 2020, Education 4.0, and Education 5.0. The discussion was aimed at identifying the transformations in the present education system. To present the technological trends affecting the education system, Prof. Kanjilal referred to the Artificial Intelligence bucket and explained the role and use of each of those technologies in the present-day education system. Later, the speaker discussed the 8-instructional design tips for developing e-content. The participants were told about the digital tools that have evolved to meet the requirements of engaged learning, Storyboard for content development and graphic organizer, eXe-tool for multimedia content development, QR-code-based e-content tools for the social web and Hot Potatoes as testing and quizzing tools to name a few.

Dr Sonam Bansal, Rao Lal Singh College, Sidhrawali, Gurugram, Haryana started her session with the opinion poll about the techno-pedagogical skills in one's day-to-day life. The presentation was focused on the utility of technological tools to enhance teaching-learning pedagogy. The speaker talked about several techno-pedagogical models

during her presentation. She further highlighted the pedagogical skills required for effecting the teaching-learning process and outlined the reflection between pedagogy and technology. Later in her presentation, the speaker discussed about several pedagogical models like, the TPACK model, SAMR model, RAT model, PIC-RAT model, ASSURE Model, and ADDIE model.

The next Plenary Session was on 'MOOCs Development and Their Relevance in Higher Education'. Prof Manas Ranjan Panigrahi, Director, Symbiosis Centre for Online Learning (SCOL), Symbiosis Skills and Professional University, Pune explained the use of technology to facilitate better learning and training that has been extended to online learning. For lab and experiments, Prof. Panigrahi spoke about VLABs and OLABs available through the internet that can be utilized for laboratory practices in remote locations also. He discussed the challenges in retaining students in online platforms despite several advantages associated with it. Prof. Panigrahi explained briefly all the stages of BASIC MOOC development, the aspects associated with the selection of topics for MOOCs, and covered all parts of intermediary stages of development.

Dr Parveen Sharma, Department of International Foundation Studies, Amity University, Tashkent talked about the changing landscape of education. He persuaded the participants to work more on their skill development rather than obtaining degrees. His mesmerizing talk on the role of technology in meeting the changes in the education scenario was praiseworthy. He talked about ChatGPT, and other GPT language models that are now being used to generate documents of choice automatically. Prof. Sharma introduced Audio MOOCs as the fifth vertical of the MOOC development approach. He deliberated on the importance and usability of audio MOOCs and explained how to make your audio e-content interesting and available to the mass. During the description of PodMoocs, Prof. Sharma mentioned a few essentials to be included with the podcasts like adding descriptions with the podcasts, adding a link to PDF, etc. Later in his deliberation, Prof Sharma mentioned platforms like Spotify, HubHopper to host the podcasts.

Mr. Jatin Ambasana, United World School of Computational Intelligence (USCI), Karnavati

University, Gandhinagar, Gujarat spoke on 'Development and Relevance of MOOCs in Higher Education'. The speaker initiated the session with the introduction of MOOCs and explained the various platforms, challenges, and solutions related to MOOCs. Platforms like Coursera, edx, Swayam, NPTEL, etc. were the highlight during the session. Later, he talked about the challenges such as one-way communication, evaluation of assignments, acceptance of course credits, completion rate, and course quality. He also suggested a few solutions which can improve the effectiveness of MOOCs like QM rubrics and evaluation of MOOCs pedagogy.

Ms Daisy Wadhwa, Head, Department of Computer Science and Applications, Guru Nanak Khalsa College for Women, Ludhiana, Punjab explained the framework and design of MOOCs. She talked about Learner Centric MOOC Model (LCM) which focuses on conceptualizing, creating, and conducting the courses. She also described the components of LCM which are learning dialogs, learning by doing, learning extension trajectories, and learner experiences interaction. She elaborated learning dialogs component in detail and carried out activities to provide better understanding.

The next Plenary Session was on 'Developing E-Content: Creation, Editing and Uploading'. Prof Gaurav Singh, Central University of Haryana, Mahendergarh shared his experience of recording videos and animations for e-content via ppts, images, or videos. He referred to various SWAYAM videos to show the participants the way of placing various kinds of content while creating e-content, discussed the minute details like text colour, background colour, font type, font size, effect of image, etc. to be used in presentations and advised to always use copyright free images only, background sound reduction for audios and videos in e-content. He also talked about gestures, body language, type of clothing for recording videos. For publicising the content and reaching the right audience, he suggested using facebook pages and youtube channels for sharing the e-content.

Prof B S Balaji, School of Biotechnology, Jawaharlal Nehru University, New Delhi described various kinds of e-contents which can be used for MOOCs and also talked about the process one should follow for its creation. He stated that one should first identify the topic to be taught and then gather the

information. He also suggested the use of scripts and storyboards while creating videos for MOOCs and advised practicing tele-scripting to excel in creating MOOC videos. Various transcription tools can also be used to enhance the videos. One can opt for scripted content or an extempore way of creating MOOC videos. Both work for the teachers while creating videos depending on the fact that the teacher is a beginner or expert in the selected topic. Prof. Balaji's presentation intended to explore the most recent trends, strategies, and best practices in e-content development and curriculum design. It covered a wide range of topics, including instructional design principles, digital tools and technologies, learner engagement strategies, and assessment methods.

Overall, the session on the Creation and editing of E-Content provided valuable insights into the evolving landscape of digital education. The participants gained a deeper understanding of instructional design principles, learner engagement strategies, assessment methods, and the integration of multimedia elements. The case studies and demonstrations further illustrated practical applications of these concepts.

The session on 'Open Educational Resources (OER) for Access and Success' conducted by Dr. Fawzi Baroud, Chairholder, UNESCO Chair and Assistant Vice President for Information Technology, Notre Dame University, Louaize (NDU) in Lebanon was aimed to shed light on the role of open educational resources in promoting innovation in digital education and how they can be effectively integrated into MOOC design. The discussions covered various aspects, including the benefits of OER, strategies for identifying and selecting appropriate resources, approaches to designing engaging MOOCs, and examples of successful implementations.

The session concluded with an interactive question and answer session, where participants had the opportunity to seek clarification, share their experiences, and discuss specific challenges and strategies related to integrating OER in MOOC design. The Q & A session further enriched the knowledge sharing and provided valuable insights for the attendees.

Further, the session on 'Interactive Video Making Tools and Interactive Lesson Plan Creation Tools' was taken up by Dr Ganesh Lokhande,

Adjunct Professor (Instructional Design), Symbiosis International University, Pune where he discussed the elements of video components, how teachers can connect to online learners even through the pre-recorded video. He emphasized the rationale of objectives before going to the main content for any given video. He also well explained how Bloom's Taxonomy can relate to the objectives of MOOCs components. In the second part of the lectures, he showed how to create the video by using a video-script writing tool, which was a come up with hands-on practical session.

Dr. Ajith Kumar. C, Professor, SOE, IGNOU talked about the need to create video-enriched e-content. He explained the virtual role of teachers versus offline mode, the pedagogy for digital content for online courses, and how one can divide digital content into different quadrants. He emphasized the use of LMS and how video lectures can be created in a more effective way to connect with students. Dr. Ajith also explained about Video studios and video-creating software which can help the teachers to create their content. While giving a demo session on developing video content, he mentioned that videos are not only to be created for a tutorial session, but it is a method to get connected with online learners. He explained the different formats of tutorials and how each one can be used for various purposes.

Dr. Sheetal Sharma, Centre for European Studies, School of International Studies, Jawaharlal Nehru University covered the elements of video creation for online mediums. She demonstrated the four-quadrant approach with the help of a dummy module creation. She showed how to prepare oneself physically and mentally for content development. She talked about gaze fixing while content delivery in the online mode and explained the creation of a complete video channel by highlighting the contents in different colors and dividing them into sub-modules or sub-channels, further merging them together.

Dr Aerum Khan, Department of TT and NFE (IASE) Faculty of Education, Jamia Millia Islamia, New Delhi talked about Open Education Resources (OER) and freeware software. She emphasized the use of easy-to-use software and hardware that can be utilized to develop high-definition video content with ease. Dr. Khan gave a demonstration of two easily

available freeware tools for video lecture creation. She showed from scratch how PowerPoint 16 can be used to create a PPT that can be further recorded easily and converted into a video lecture. During her demonstration, she also exhibited different aspects of editing and how the existing recordings can be edited to incorporate changes required in the future. The other tool she demonstrated was the LOOM extension available with Chrome. She explained the difference between the two tools in their performance and demonstrated the usage of LOOM by creating a dummy video.

The session on 'Intellectual Property and Copyright Issues Related to E-content' was taken up by Dr. Ilavenil Karunakaran, Assistant Professor, Department of Anatomy, Karpagam, Faculty of Medical Sciences and Research, Coimbatore. The session started with some brainstorming activities for participants, she asked about what can be included in IPR, what can and can't be patentable, and explained the difference between copyright and patent. She guided me well that what things are copyrightable or non-copyrightable and the process of submitting copyright. She also discussed the infringement of copyright, legal binding, and its implementation. She nicely explained the factors in fair use/fair dealing of copyright. She also talked about the ways of avoiding copyright infringement from the e-content. Participants had the opportunity to learn how to adopt and create open education resource content.

Dr Aerum Khan, Associate Professor, Department of Teacher Training and Non-formal Education, Faculty of Education, Jamia Millia Islamia, New Delhi took the session where she discussed creating open educational resource content (OERC). She showed how to create OERC, which was a come up with hands-on practical session. Participants learned many key points of creating an effective OERC. She also emphasizes creative commons copyright licenses and types of licenses. She explained the tools give everyone from individual creators to large companies and institutions a simple, standardized way to grant copyright permissions to their creative work. After her lecture, there was an interactive discussion session, where participants got the opportunity to clear their doubts and they discussed their queries.

Dr Briju Thankachan, Visiting Faculty, Educational Technology, IIT Bombay and Executive Director, Educational Technology Society of India started his session with participants understanding what 'Effective communication' means for learners and what is Ed Tab society. He discussed about the fair guidelines to identify the content online for teaching, conducted an amazing interactive session with multiple-choice questions, and spoke about the Indian copyright act, of 1957. Toward the end of the session, some practical activity was carried out with respect to how to find resources online. After his lectures, there was an interactive chat session, where participants got the opportunity to clear their doubts by writing up questions that were answered during the session.

Dr Sarika Chouhan, Chief Academic Officer, Vidyalankar School of Information Technology, Mumbai started her session with the use of copyright in free material in creating online digital content. The use of copyright in free material is a complex issue, especially when it comes to creating online digital content. She emphasized the use of Google Advanced Search as a tool for finding free content that is licensed for reuse. Creative Commons licenses allow users to share and adapt creative content under a variety of terms, including attribution, non-commercial, and share alike. She also mentioned that it is crucial to understand the underlying concepts of attribution and non-commercial when using Creative Commons licensed content.

The next session was on 'Pedagogy and Course Delivery: Effective Communication, Use of Multimedia and Interaction Strategies to Facilitate Learning'. Dr. Ajita Deshmukh, Programme Leader, M Sc. E-learning Programme, MIT-ADT University, Pune started her session with what 'Effective Communication' means for learners. She explained content coherent relevance and how using of social media over video and video over audio and audio over text is more effective. She also familiarized the audience with the usage and importance of emerging technology like AI simulation and AR/VR.

The Plenary Session on 'Enhancing MOOC with Artificial Intelligence, Gamification, Virtual and Augmented Reality' was conducted. Dr Ramesh C Sharma, Associate Professor, School of Global Affairs, Director, Human Resource Development

Centre, Dr B.R. Ambedkar University, Delhi started the session by defining MOOCs and shed light on how MOOCs are different from internet resources. He introduced the participants to the origin and platforms of MOOCs. He talked about various AI tools available for classroom teaching language learning, research purpose, and referencing. To name a few are word tune, tome.app, elicit.org. pictory, smart sparrow, etc, humata, looker studio, etc. He engaged the participants by demonstrating the tools like humata and pictory.org.

Dr Yash Paul Sharma, Central University of Kerala began his session with concepts of licensing and copyrights. He described the importance of copyrights in MOOCs and the need for policy direction in MOOCs. Further, he talked about the augmentative and virtual reality of content. The session became more interesting and interactive when he demonstrated the difference between augmentative and virtual reality. He also explained the troubleshooting methods for content reality. Dr. Paul clarified AR core devices and NCERT augmented reality applications.

Mr. Abhishek Kadiyala, Published Author, Researcher, Department of International Relations, Peace and Public Policy, St. Joseph's University Bangalore started with a discussion about Artificial Intelligence and the different types of AI tools that are available with examples. He also talked about the Dos and Don'ts of AI and discussed how can AI be used in open education. Participants learned about the three Cs (Content, Coordination, and Communication) of AI for making effective open resources.

Prof. V P Joshith, Professor, Department of Education, Central University of Kerala began his session with demo classes for participants, discussion on gamification, and how to engage with the content. He showed how to use Blooket and Quizzes, gamified learning tools for the assessment purpose to make exciting learning which was a come up with hands-on practical session.

The session on 'Assessment for Self-directed Learning' was conducted by Dr. Sonam Bansal, Rao Lal Singh College of Education, Sidhrawali, Gurugram. She highlighted the importance of feedback-based e-assessment in digital pedagogy and its impact on enhancing student learning outcomes.

Her lecture covered various aspects, including the benefits of e-assessment, strategies for effective feedback delivery, and the role of technology in supporting assessment practices. The speaker also emphasized fostering student engagement and autonomy. Participants learned how providing meaningful feedback can empower students to take ownership of their learning, set goals, and make progress. Strategies for involving students in the assessment process and encouraging self-reflection were shared. Dr. Bansal also introduced Technology Tools for e-assessment by showcasing a range of technology tools like Rebus Create Club, AI in Education, wisconline, Genially, etc. that can facilitate e-assessment and feedback delivery. Participants gained insights into the features and capabilities of learning management systems, online assessment platforms, and digital tools specifically designed for providing feedback.

Dr. Prerna Mandhyan, Department of Education, D S College, Katihar started her session with a briefing about self-directed learning, its significance in promoting student-centric learning, and its key principles such as Autonomy, Ownership, self-motivation, Flexibility, and Reflectiveness. Then the session moved ahead with how online learning can be incorporated as self-directed learning. Dr Mandhyan suggested tools that support self-assessment and progress tracking such as Rubrics, Self-Reflection Worksheets, learning Portfolios, Self-Reflection Journals, Self-assessment questionnaires, Strengths and Weaknesses Analysis, Goal Setting and progress tracking, Exit Tickets, Student-led Conferences. The speaker emphasized the significance of performance-based assessments, such as presentations, debates, exhibitions laboratory experiments, problem-based learning, and simulations.

Prof. Kushal Sen, Indian Institute of Technology Department of Textile Technology, Hauz Khas, during his lecture discussed in detail the impact of NPTEL e-courses in educating learners. He highlighted that before designing an e-course, the teacher must define the learning objectives properly as it defines the focus areas for a student and helps teachers plan and finally evaluate. The speaker gave examples of various courses and discussed different ways of assessing individual learners as well as group learners. Prof. Sen also advised using different types of evaluations: proctored assessments, continuous

evaluations, quizzes, tests, open-book exams, seminars, presentations, etc.

Dr Jako Olivier, Adviser, Higher Education at the Commonwealth of Learning, Burnaby, Canada started the session by explaining self-directed learning in detail and its need in today's scenario. He said an environment needs to be provided to the learners to encourage self-learning in them so that they stay motivated, manage themselves, and self-monitor themselves. He also shared various resources for further reading on the 'Self-Directed Learning Series'. He then talked about various approaches to assessments in e-courses from his book 'Learning through Assessment: An Approach towards Self-directed Learning'. He discussed different types of assessments: summative assessments, formative assessments, self-assessments, peer assessments, tests, examinations, worksheets, portfolios, etc.

The next session was on 'Methods of Evaluating MOOC Effectiveness and Quality Assurance Process'. Dr. Ajita Deshmukh, Program Leader, M.Sc. E-Learning Program, MIT-ADT University, Pune talked about how to choose a topic, what are the factors they have to keep in mind, including several factors like selection of platform for uploading materials, targeted participants, permissions of content sharing, and most importantly the budget for developing of MOOCs.

Prof. Anurag Jain, Coordinator (AICTE Coordination Team), University School of ICT, Guru Gobind Singh Indraprastha University, Delhi conducted a session on cyber security and content security including security analysis. He gave guidance on spam, cyber security while choosing online platforms, and ways to get rid of hackers while opting for courses online. He also mentioned about the purpose of MOOCs is quite relatable to the current scenario and what kind of threat we can expect while developing the MOOCs course and how to solve those problems with ease.

Dr. Ajita Deshmukh, Programme Leader, M.Sc. E-Learning Programme, MIT-ADT University, Pune continued the session post-break where she started with the importance of evaluation in MOOCs. She talked about how a single object or task can reflect different objectives and predicts various perspectives. Further, she discussed the steps involved in evaluation such as autonomy and

outcome perspective. She also explained the impact of digital fatigue on individuals attending MOOCs. She concluded the session by describing the role of quality online course initiative (QOCI) (de1988) and rubrics Google sheet in the evaluation of MOOCs. Challenges in the evaluation of MOOCs were also part of the discussion.

Dr. Kiran Lata Dangwal, Department of Education, University of Lucknow started the session by reflecting on the significance of evaluation in MOOCs and elaborated on the need for learner-engagement metrics, pre-post course assessment, survey feedback, peer review, expert review, and comparative analysis. She also added various procedures to make a standard MOOC. For example, quality assurance standards, social network analysis, learning support mechanisms, scalability, and cost-effectiveness. The need for team members in development was also highlighted during the discussion.

The session on 'Implementation of Technology-Driven Skills for Sustainable Development' was conducted where Dr. Sonam Bansal, Rao Lal Singh College of Education, Sidhrawali, Gurugram started with a poll on Mentimeter to get an idea if the participants are interested in the creation of MOOCs or not. Dr. Sonam Bansal motivated the participants to create online content and shared with them several details of the free platforms that can be used for creation and publishing. She highlighted the usage of Canvas, mooKIT, and Edmodo tools. In the later part of the lecture, the speaker demonstrated the Canvas tool for the development of MOOCs.

The second lecture of the 12th day morning session was given by Prof. V Vijaya Rama Raju, Professor, Department of Electrical and Electronics Engineering, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, where he talked about evolution in the education

system and moved on the future of education system and the technology that will be driving it. He emphasized the benefits of technology in education and the ease of learning due to it. In the later part of his deliberation, Prof Raju talked about sustainability with a focus on SDG-4 which focuses on quality education. He talked about key technologies like IoT, Data Analytics, Artificial Intelligence, Augmented Reality, Virtual reality, and blockchain Technology. The speaker discussed different aspects of these technologies that can be utilized in education and can make the system more sustainable. He made the session interactive by putting on Poll questions using Mentimeter to capture participants' attention.

During Valedictory Session, Dr. Parijat Bhattacharjee, Assistant Professor, Amity School of Languages presented the report of the event which was followed by feedback on the mentimeter where participants shared their experiences and gave feedback about the two-week online refresher course. Dr Ramesh C Sharma, Associate Professor, School of Global Affairs, Director, Human Resource Development Centre, Dr. B R Ambedkar University, Delhi in his lecture mentioned the various AI tools like *chartify.ai*, *gnu.org*, *graphy.app*, *avatarify.art*, *orcid*, *mapdeduce.com*, *hemingwayapp.com*, *noplug.com*, etc. which can be helpful for the teachers to create e-content. Prof Sameer Sahasrabudhe, Professor, Practice (Design), IIT Gandhinagar spoke about MOOCs: Challenges and Opportunities and elaborated on the role of communities of practice in e-content creation. Prof. Sahasrabudhe also expressed the need to create a sense of community and build a community of practice. He also mentioned the open-source resource called Blender and elaborated on how it functions. Dr. Sanjna Vij expressed gratitude to all the attendees and also thanked various committee members who ensured the smooth conduct of the refresher course.

□

THESES OF THE MONTH

SCIENCE & TECHNOLOGY

A List of doctoral theses accepted by Indian Universities (Notifications received in AIU during the month of April-May, 2023)

AGRICULTURAL & VETERINARY SCIENCES

Biotechnology

1. Kiran Devi. **Deciphering genomic regions associated with traits of terminal heat stress in wheat using SNP markers.** (Dr. Sulekha Chahal and Dr. Ratan Tiwari), Department of Biotechnology, Kurukshetra University, Kurukshetra.

2. Nagpal, Raksha. **Industrial applications of xylano-pectinolytic enzymes from a bacterial isolate: *Bacillus pumilus* AJK.** (Dr. Ritu Mahajan), Department of Biotechnology, Kurukshetra University, Kurukshetra.

BIOLOGICAL SCIENCES

Biotechnology

1. Kar, Bipasa. **Identification of phyto-compounds as antimicrobials against beta-lactamase producing gram-negative bacteria: in silico, in vitro study.** (Dr. Debduitta Bhattacharya and Dr. Chanakya Nath Kundu), Department of Biotechnology, Kalinga Institute of Industrial Technology, Bhubaneswar.

2. Mishra, Gyan Prakash. **A multi-omics approach to understand the host response upon pathogen infection.** (Dr. Sunil Kumar Raghav and Dr. Bhawna Gupta), Department of Biotechnology, Kalinga Institute of Industrial Technology, Bhubaneswar.

3. Murthy, Vidya S. **Studies on molecular aspects of high temperature tolerance in Banana.** Department of Biotechnology, Jain University, Bangalore.

Microbiology

1. Anita. **Assessment of lactic acid bacteria for antimicrobial, antioxidant, antimutagenic and probiotic attributes.** (Dr. Neeraj Kumar), Department of Microbiology, Kurukshetra University, Kurukshetra.

2. Sharma, Amit. **Study of medicinal plants for antimicrobial, antioxidant, antimutagenic and antigenotoxic potential.** (Dr. Neeraj Kumar), Department of Microbiology, Kurukshetra University, Kurukshetra.

3. Verma, Pooja. **Isolation, identification and characterization of potential soil bacteria as biological control agents against fungal plant pathogens.** (Dr. Baljeet Singh Saharan and Dr. Priyanka Chandra),

Department of Microbiology, Kurukshetra University, Kurukshetra.

EARTH SYSTEM SCIENCES

Environmental Science

1. Mishra, Nirmalendu Sekhar. **Advanced nanomaterials for adsorption and improved visible light utilisation intended for pollution abatement.** (Prof. Saravanan Pichiah), Department of Environmental Science & Engineering, Indian Institute of Technology, Dhanbad.

2. Venkatesh, Madavi. **Geochemical investigation of trace elements and Rees in water and surface sediments: An implication in restoration and conservation of Betwa River Basin.** (Prof. Anshumali), Department of Environmental Science and Engineering, Indian Institute of Technology, Dhanbad.

Geology

1. Das, Piyush Ranjan. **Petrographic controls on coal bed methane of Jharia Coal Basin, Jharkhand, India.** (Prof. Atul Kumar Varma), Department of Applied Geology, Indian Institute of Technology, Dhanbad.

2. Dinesh Kumar. **Petrological and geochemical settings for hydrocarbon attributes on palaeogene organic sedimentary archives of Bikaner-Nagaur Basin, Rajasthan, India.** (Prof. Atul Kumar Varma), Department of Applied Geology, Indian Institute of Technology, Dhanbad.

3. Sahoo, Akhandal. **Petrographic controls on carbon nano-products formation.** (Prof. Atul Kumar Varma), Department of Applied Geology, Indian Institute of Technology, Dhanbad.

Geophysics

1. Dhubia, Santosh. **Seismic imaging using high performance computing associated with hydrocarbon exploration.** (Prof. Saurabh Datta Gupta), Department of Applied Geophysics, Indian Institute of Technology, Dhanbad.

ENGINEERING SCIENCES

Chemical Engineering

1. Md Shakir. **Synthesis of novel boron containing**

catalyst for the dry reforming of methane reaction. (Prof. Sidhhartha Sengupta), Department of Chemical Engineering, Indian Institute of Technology, Dhanbad.

Civil Engineering

1. Hati, Shantanu. **Game theory and nonlinear programming.** (Prof. Sarat Kumar Panda), Department of Civil Engineering, Indian Institute of Technology, Dhanbad.

2. Sachidanand Kumar. **Analysis of spatio-temporal characteristic of hydrological extremes in India due to climate change.** (Prof. Kiromala Chanda and Prof. Srinivas Pasupuleti), Department of Civil Engineering, Indian Institute of Technology, Dhanbad

Computer Science & Engineering

1. Ajeet Kumar. **Effective tuning approaches for regulation and optimization parameters in deep networks.** (Dr. P V R D Prasada Rao and Dr. K Venkatesh Sharma), Department of Computer Science & Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

2. Basavaraj, Kurubara. **Health diagnosis by indigenously developed wrist pulse detector and analyzer.** Department of Computer Science & Engineering, Jain University, Bangalore.

3. Chaitra, Y L. **IVTR: Image and video text recognition system.** Department of Computer Science & Engineering, Jain University, Bangalore.

4. Gaikwad, Kiran Pandhari. **Design and development of an improved Bimodal Emotion Recognition System (BERS) based on facial and speech features.** (Dr. Manna Sheela Rani Chetty), Department of Computer Science & Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

5. Moturi, Sireesha. **An effective clinical decision support system to improve the accuracy of cardiovascular and breast cancer disease prediction through optimal feature selection.** (Dr. V Srikanth and Dr. S N Tirumala Rao), Department of Computer Science & Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

6. Narender. **Metaheuristic approaches for comprehensive software reliability optimization.** (Dr. Sona Malhotra and Dr. Sanjeev Dhawan), Department of Computer Science & Engineering, Kurukshetra University, Kurukshetra.

7. Narwal, Abha. **Privacy preservation assessment through web mining for websites.** (Dr. R. K. Chauhan), Department of Computer Science & Engineering, Kurukshetra University, Kurukshetra.

8. Noorullah, R. M. **Hybrid topic models for twitter-based data clustering with multi-viewpoints cosine-based similarity metrics.** (Dr. Mohammed Moulana), Department of Computer Science & Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

9. Sarada, Nakka. **A neural network architecture for classification and diagnosis of digital, chest radiographs.** (Dr. G Pardha Saradhi Varma and Dr. K Thirupathi Rao), Department of Computer Science & Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

10. Shaik, Riaz. **An agent based hybrid approach for dynamic key management and attack resilient system for wireless sensor network.** (Dr. K Thirupathi Rao), Department of Computer Science & Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

Electrical & Electronics Engineering

1. Das, Rojaleena. **Metaloxide based hydroelectric cell fabrication studies using industrial waste red mud.** (Prof. P.B. Sharma and Dr. R.K. Kotnala), Faculty of Engineering, Amity University, Gurgaon.

2. Harihar, Sanjeevakumar. **Image registration & fusion based on controlled spread of the histogram.** Department of Electronic Engineering, Jain University, Bangalore.

3. Jebran, P Mohamed. **Detection of early stage diabetic retinopathy by developing a novel classifier using machine learning.** Department of Electrical Engineering, Jain University, Bangalore.

4. Kalamchety, Srinivasa Ravi Kumar. **A novel non-isolated bidirectional DC-DC converter with improved reliability, compactness, high gain and efficiency.** (Dr. A Pandian), Department of Electricals and Electronics Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

5. Manish Kumar. **Artificial intelligence and blockchain aided smart grid for better energy management.** (Prof. Nitai Pal), Department of Electrical Engineering, Indian Institute of Technology, Dhanbad.

6. Mishra, Shalini. **Dielectric response analysis based condition assessment of oil-filled and dry-type transformer insulation.** (Prof. Arijit Baral), Department of Electrical Engineering, Indian Institute of Technology, Dhanbad.

7. Mudundi, Rekha. **Optimal sizing and control of PV assisted single-phase fed three phase induction motor drive for rural agricultural applications.** (Dr. M Kiran Kumar), Department of Electrical & Electronics Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

8. Paramguru, Jagannath. **Some studies in dynamic economic dispatch by using computational intelligence approach incorporating microgrid.** (Dr. Subrat Kumar Barik), Department of Electrical Engineering, Kalinga Institute of Industrial Technology, Bhubaneswar.

9. Sree Ranjani, N. Y. **Data aggregation in wireless sensor networks for home security and healthcare applications.** Department of Electronic Engineering, Jain University, Bangalore.

Electronics & Communication Engineering

1. Bhanuprakash, D. **Implementation of a novel deep learning technique for plant species identification and classification.** (Dr. V Rajesh), Department of Electronics & Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

2. Chaudhary, Vijay Shanker. **Development of surface plasmon resonance based photonic crystal fiber for physical and biochemical sensing applications.** (Dr. Dharmendra Kumar), Department of Electronics & Communication Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur.

3. Das, Abhishek. **Classification of biomedical image using intelligent computing techniques.** Department of Electronics & Communication Engineering, Siksha O Anusandhan University, Bhubaneswar.

4. Gade, Mary Swarna Latha. **Design of fault-tolerant Quantum dot Cellular Automata (QCA) based digital logic circuits using reversible logic.** (Dr. S Rooban), Department of Electronics & Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

5. Maddali, Anil Kumar. **Enhanced classification and mathematical analysis of disordered patients voice features using HPCA.** (Dr. Habibulla Khan), Department of Electronics & Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

6. Mishra, Neha. **N₂O nano gas sensor design using 2D TMD MoSe₂ Monolayer.** (Dr. Bramha P Pandey), Department of Electronics & Communication Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur.

7. Mishra, Suchana. **Some investigations into utility of fractional calculus in applied electromagnetics.** (Prof. Srikanta Patnaik), Department of Electronics & Communication Engineering, Siksha O Anusandhan University, Bhubaneswar.

8. Sivasankaraphani, T. **An ultra-low power parallel accelerator for energy- efficient in multi-core embedded system.** (Dr. K Srinivasa Rao and Dr. M Durga Prakash), Department of Electronics & Communication

Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

9. Syed Salma. **Design and analysis of a compact notched MIMO antenna using optimization techniques for portable UWB applications.** (Dr. Habibulla Khan), Department of Electronics & Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

Fuel & Mineral Engineering

1. Das, Dipika. **Characterization and processing of different biomass for their utilization in reduction of iron ore pellets.** (Prof. Shalini Gautam), Department of Fuel, Mineral & Metallurgical Engineering, Indian Institute of Technology, Dhanbad.

2. Harichandan, Barun. **Studies on leaching of copper from low grade sulphide ore and application of enhanced gravity separation to recover precious metal from the leached residue.** (Prof. Narayan Rittapa Mandre), Department of Fuel, Minerals & Metallurgical Engineering, Indian Institute of Technology, Dhanbad.

3. Prasad, Rakesh. **Study on drying and induration characteristics of iron ore pellets.** (Prof. Shatughan Soren), Department of Fuel, Mineral & Metallurgical Engineering, Indian Institute of Technology, Dhanbad.

Mechanical Engineering

1. Nitesh Kumar. **Development and performance analysis of a micro electrochemical discharge machine for micro hole drilling operations.** (Prof. Alok Kumar Das), Department of Mechanical Engineering, Indian Institute of Technology, Dhanbad.

2. Sheik, Mohammed Anees. **Experimental studies on the performance improvement of photovoltaic system integrated nano PCM cooling technique.** Department of Mechanical Engineering, Jain University, Bangalore.

3. Sujit Kumar. **Investigations on symmetric and asymmetric NACA airfoils with different thickness ratios: Flow and acoustic characteristics.** (Prof. Subramanian Narayanan), Department of Mechanical Engineering, Indian Institute of Technology, Dhanbad.

4. Tyagi, Sakshi. **Photovoltaic advancements in performance of nanocomposite based solar trigeneration systems.** (Prof. Pawan Kumar Singh), Department of Mechanical Engineering, Indian Institute of Technology, Dhanbad.

Mining Engineering

1. Behera, Umakanta. **Study of settling characteristics of fly ash slurries, and water drainage from fly ash for hydraulic stowing in underground coal mines.** (Prof. Devi Prasad Mishra), Department of Mining Engineering, Indian Institute of Technology, Dhanbad.

2. Murumu, Sunny. **Investigation of factors influencing the stability of longwall face with respect to roof weighting in Longwall panels.** (Prof. Gnananandh Budi), Department of Mining Engineering, Indian Institute of Technology, Dhanbad.

3. Nidumukkala, Sri Chandras. **Evaluation of rock fragmentation and ground vibration with geo-blast design parameters in surface mines using modern face mapping tools and artificial intelligence techniques.** (Prof. Bhanwar Singh Choudhary), Department of Mining Engineering, Indian Institute of Technology, Dhanbad.

4. Sai, Lingampally. **Study of strata behaviour for stability of continuous miner panels using numerical simulation and machine learning techniques.** (Prof. R M Bhattacharjee and Prof. Gnananandh Budi), Department of Mining Engineering, Indian Institute of Technology, Dhanbad.

5. Singh, Chandra Shekhar. **Development of risk management based mine evacuation & re-entry protocol for fire and explosion hazards in underground coal mines.** (Prof. R M Bhattacharjee), Department of Mining Engineering, Indian Institute of Technology, Dhanbad.

Nanotechnology

1. Rego, Richelle Mahima. **Metal organic frameworks and their composites for the removal of emerging contaminants.** Department of Nanotechnology, Jain University, Bangalore.

2. Sree Raj, K. A. **Two dimensional layered materials and their heterostructures for supercapacitor applications.** Department of Nanotechnology, Jain University, Bangalore.

Petroleum Engineering

1. Deka, Barasha. **Development of chemical additives for the control of flow assurance problems in the oil and gas fields.** (Prof. Vikas Mahato), Department of Petroleum Engineering, Indian Institute of Technology, Dhanbad.

MATHEMATICAL SCIENCES

Mathematics

1. Rajak, Bhanu Pratap. **Mathematical study of elasto-dynamic waves propagation in functionally graded, magneto-elastic and double porous layered media.** (Prof. Santimoy Kundu), Department of Mathematics and Computing, Indian Institute of Technology, Dhanbad.

2. Redeem, Anantha Lakshmi. **Some studies on prime labelings of cycle and triangle free graphs.** (Dr. T Madhavi and Dr. K Jayalakshmi), Department of

Mathematics, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

3. Singh, Ajeet Kumar. **Mathematical analysis of elastodynamic problems involving layered structures comprising homogeneous/ heterogeneous media.** (Prof. Abhishek Kr Singh), Department of Mathematics and Computing, Indian Institute of Technology, Dhanbad.

4. Singh, Sonam. **On plane and anti-plane waves in layered models of piezoelectric composites, fiber reinforced and flexoelectric materials with non-conventional boundaries.** (Prof. Abhishek Kr Singh and Prof. Amares Chattopadhyay), Department of Mathematics and Computing, Indian Institute of Technology, Dhanbad.

MEDICAL SCIENCES

Genetics

1. Narenkumar, M. **Exploration of transcriptional factor PAX3 role in neuronal cell differentiation.** (Dr. Mathivanan Jothi and Dr. A R Prabu Raj), Department of Genetics, National Institute of Mental Health & Neuro Sciences, Bengaluru.

Neurology

1. Ali, Syed Farooq. **Neurobiological markers of treatment resistance in obsessive-compulsive disorder.** (Dr. Shyam Sundar A and Dr. G Venkatasubramanian), Department of Clinical Neurosciences, National Institute of Mental Health & Neuro Sciences, Bengaluru.

2. Anusha, Yarlagadda. **Neuroanatomical profiling of mitochondrial function in the human brain and correlation with age.** (Dr. Anita Mahadevan), Department of Neuropathology, National Institute of Mental Health & Neuro Sciences, Bengaluru.

3. Bhaduri, Bidisha. **Study of organellar proteins and neuronal structure to access differential vulnerability to Parkinson's disease: An investigation using MPTP in experimental systems and electron microscopy of human non-MPTP Parkinsonian skin biopsies.** (Dr. Phalguni Anand Alladi and Dr. Ravi Yadav), Department of Clinical Psychopharmacology and Neurotoxicology, National Institute of Mental Health & Neuro Sciences, Bengaluru.

Pharmaceutical Science

1. Patel, Brijesh Pradipkumar. **Formulation development and evaluation of transdermal delivery systems for some drugs used in arthritis.** (Dr. Hetal Paresh Thakkar), Department of Pharmacy, M S University of Baroda, Vadodara.

PHYSICAL SCIENCES

Chemistry

1. Halakarni, Mahaveer A. **Designing high performance compatible membranes and draw solutions for forward osmosis and nanofiltration process of industrial importance.** Department of Chemistry, Jain University, Bangalore.

2. Jaiveer Singh. **Study of adsorption behaviour of water contaminants and drugs towards surface functionalized magnetite nanoparticles.** (Dr. Ramesh Kumar), Department of Chemistry, Kurukshetra University, Kurukshetra.

3. Jawadhusen, Munshi. **Studies on the chemistry of some transition metal ion complexes containing multidentate ligands.** (Dr. Sujit Baran Kumar), Department of Chemistry, M S University of Baroda, Vadodara.

4. Rahul Singh. **Synthesis of thiazolidinone based heterocyclic compounds as α -amylase inhibitors.** (Dr. Parvin Kumar), Department of Chemistry, Kurukshetra University, Kurukshetra.

5. Verma, Shruti. **Synthesis and characterization of cucurbit [6] URIL supported CuO, Fe₃O₄ and β -Ni(OH)₂ nanoparticles: Applications in C-C and C-N bond formation reactions.** (Prof. D D Pathak), Department of Chemistry and Chemical Biology, Indian Institute of Technology, Dhanbad.

6. Vukoti, Kirankumar. **Design, synthesis and biological activity of novel heterocyclic benzofuran, isoxazoles, benzohiazole and imidazopyridine derivatives.** (Dr. K R S Prasad), Department of Chemistry, Koneru Lakshmaiah Education Foundation, Guntur.

7. Woldeamanuel, Melaku Masresha. **Ethnomedicinal evaluation of plants from asteraceae family: A probe into the phytochemical characterization, structure elucidation and antioxidant activity of *Echinops kebericho* Mesfin.** (Dr. Prasanta Rath and Dr. Alok Kumer Panda), Department of Chemistry, Kalinga Institute of Industrial Technology, Bhubaneswar.

Physics

1. Baloni, Manoj. **Synthesis, structure and properties of modified Bismuth ferrite-perovskite solid solution.** (Prof. R C Sharma and Dr. Hemant Singh), Department of Physics, Shree Guru Gobind Singh Tricentenary University, Gurugram.

2. Debata, Suryakanti. **Computational study of perylene-based organic semiconductors for charge transport and optoelectronic applications.** (Prof. Sridhar Sahu), Department of Physics, Indian Institute of Technology, Dhanbad.

3. Ravanamma, Rallapalli. **Rare earth ions doped barium titanate nanoceramics based faradic hybrid supercapacitors for energy storage applications.** (Dr. K Muralidhara Reddy), Department of Physics, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu. □

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Sr. No.	Post /Subject	No. of Vacancies	Qualification	Reservation	Nature
1	Principal	01	M.A./M.Sc., Ph.D., 15 Years experience	01 [OPEN]	Non-Granted
2	Physics	01	M.Sc. NET/SET/Ph.D.	01 [O.B.C.]	Grant-in-aid

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- For more details visit college website: www.rsacscollege.com.
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NOTIFICATION

Applications in the prescribed form are invited from qualified and eligible candidates as per UGC Regulations, Government of Kerala norms and M.G University statutes for appointment against the following post of Teaching Staff existing in Arts & Science Colleges under this Corporate Management.

Sl No.	Category of Post	Number of vacancies	
		General	PWD Reservation
1.	Assistant Professor Zoology (Re-notification)	-	1 Reserved as per G.O.242/2022/H.Edn (5) Priority order 2 - for Hearing disability

Age, qualification and scale of pay - As prescribed by the Govt/UGC/M.G University rules. Applicants should be fully qualified at the time of submission of application. Those who are qualified from Universities other than Mahatma Gandhi University, Kottayam should submit

Place: Devalokam
Date : 05.07.2022

Equivalency Certificates and Eligibility Certificate from the Mahatma Gandhi University along with the applications.

Application can be had from the Secretary, M.O.C. Colleges Corporate Management Office Devalokam, Kottayam on payment of Rs.700/- in person or can be downloaded from the above website. Along with the downloaded application form a DD of Rs.700/- in favour of Manager, MOC Colleges payable at State Bank of India Devalokam Branch, Kottayam - 686 004 should be enclosed.

Filled up applications together with self attested copies of certificates to prove age, date of birth and qualification should reach the office of the undersigned on or before 3 rd August 2023 (03.08.2023) 4.00 PM (30 days from the date of notification). Incomplete and late applications will be rejected. The applicants should attach self attested copies of PWD certificate issued by the concerned Medical Board to prove their nature of disability.

(Sd/-) Dr. M.E. Kuriakose
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We invite Heads of Research Institutions, Universities, Medical and Pharmaceutical Colleges of India to nominate eligible candidates for :

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Indian nationals under the age of thirty (as on July 01, 2023), who have completed at least 1st year of MD or PhD in Biomedical or Pharmaceutical Sciences are eligible to apply. Those who have completed their MD, or PhD and above the age of thirty, as on date July 01, 2023 are not eligible to apply. The applicant should have completed a Research Project and should be willing to present his/her research work in front of knowledgeable assessors.

The applicants should submit:- (1) detailed CV with photograph (2) copy of their detailed research work (3) letter from the supervisor certifying that the research work under reference has actually been done by the applicant (4) a citation (brief summary) on his/her research work. (5) forwarding letter from the Head of the Department or Institution, giving justification for nominating the applicant (6) A voluntary declaration from the applicant that they would work in the public or private funded academic/research based organizations for a minimum period of two years after completion of his/her studies. The applicant should also submit the following testimonials.

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- Proof of age
- Copies of the publications, if any
- Merits/Awards/Scholarships received, if any
- A letter stating that the project submitted for the award has received ethical clearance,
- A statement duly signed by the nominee and the supervisor/co-author that the thesis has no-conflict of interest academically or financially.

The applicants should submit their nominations online at Sun Pharma Science Foundation's website www.sunpharmasciencefoundation.net from **July 01, 2023 to August 31, 2023**. Also required to send a print copy of the nomination, to the office of the Foundation **by September 15, 2023**.

Detailed nomination procedures of the awards are available on Sun Pharma Science Foundation's website.

For further information, please contact :

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Website : <https://www.sunpharmasciencefoundation.net>



SUN PHARMA SCIENCE FOUNDATION CLINICAL RESEARCH FELLOWSHIP 2023

EMPOWERING CLINICIANS TO CARRY OUT INDEPENDENT CLINICAL RESEARCH

We invite Young Clinician Scientists to avail the “Sun Pharma Science Foundation Clinical Research Fellowship 2023”. This Fellowship is meant to support the brilliant and upcoming early career clinicians working in India. An Assistant Professor employed in any Medical College in India will be eligible to be considered for this Research Fellowship. Preference will be given to an Assistant Professor who has obtained the first academic appointment within two years from the year of consideration for Fellowship. The research has to be done on a specific project under the supervision of a researcher of renown in an institution in India. The fellowship has to be availed in an institution other than the one the candidate is employed in.

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▲ Eligibility

- ❖ An Assistant Professor employed in any Medical College in India will be eligible to be considered for this Research Fellowship.
- ❖ Preference will be given to an Assistant Professor who has obtained the first academic appointment within two years from the year of consideration for Fellowship.
- ❖ Should have obtained a MBBS degree.

▲ How to apply

The applicants should submit their nominations online using the link:- <https://www.sunpharmasciencefoundation.net/>

The application will be started accepting from **June, 2023 to August, 2023. Please visit our website.**

▲ Information to be submitted

Application has to be made on a specified application form along with documents as specified on the application form. The Application Form can be downloaded from website link as provided in above section.

The filled application form with all supporting documents should reach the office of the Foundation within 7 days of the last date of application.

For further information, if any, please contact :
OFFICE OF SUN PHARMA SCIENCE FOUNDATION
8C, 8th Floor, Hansalaya Building, 15-Barakhamba Road,
New Delhi : 110 001 (India)
Tel. (91-11) 23721414 / 23721415
email : sunpharma.sciencefoundation@sunpharma.com
Website : <https://www.sunpharmasciencefoundation.net/>



राष्ट्रीय औषधीय शिक्षा एवं अनुसंधान संस्थान (नाईपर)

**NATIONAL INSTITUTE OF PHARMACEUTICAL
EDUCATION & RESEARCH (NIPER)**

(Department of Pharmaceuticals, Ministry of Chemicals & Fertilizers)

Sector – 67, S.A.S. NAGAR (MOHALI) - 160062, Punjab

www.niper.gov.in

Ph: 0172-2292000, 2214682-83 & 2214688

RECRUITMENT NOTICE FOR TEACHING POSITIONS

(Advt. No. 6/2023 dated 08-07-2023)

The National Institute of Pharmaceutical Education & Research (NIPER), SAS Nagar (Mohali) is an autonomous Institute of National importance set up by the Government of India, Ministry of Chemicals & Fertilizers by an Act of Parliament, to impart higher education and undertake advanced research in the field of Pharmaceutical sciences, technology and management.

Applications are invited from the eligible candidates for the following vacant posts on direct recruitment basis as under:

Group	Name of the post	Discipline	No. of vacancies	Cat.	Maximum Age (as on the last date of Advertisement)	Pay Matrix Level as per 7th CPC
A	Professor	Pharmaceutical Technology – Formulations	01	OBC	50 years	Level-13A2 (Academic Pay Level) (Rs.1,39,600 -2,11,300/-)
		Pharmaceutical Technology- Bio-technology	01	UR		
		Bio-technology	01	UR		

Applicants are requested to read the instructions carefully before applying. For detailed description of educational qualification, experience, other eligibility criteria and general information, please visit Institute website www.niper.gov.in/jobs.html.

Last date for submission of application form is **07-08-2023 (Monday)** i.e. 30 days from the date of publication in Employment News. Duly filled in application form is required to be submitted through speed post/registered post/courier/by hand on or before the last date of submission of application.

कुलसचिव