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Janta B.Ed. College, Mahavir Society, Nanded

WANTED

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Janta B.Ed. College, Mahavir Society, Nanded

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Accreditation of Higher Education Institutions in the Transformative Age

H A Ranganath*

Accreditation of institutions started three decades back in India and is a potential instrument to promote quality in Higher Education Institutions (HEIs). It may be summed up as Accreditation = Assessment + Reformation of HEIs. Assessment of the performance of HEIs is done by drawing the criteria and benchmarks from the education policy of the country and also of the aspirations of the stakeholders. In a way, the social responsibility of accrediting agencies is to provide real-time data on HEIs to students, parents, employers, policymakers, and society at large to make a conscious decision. At the same time a wake-up call to HEIs reminding them of their requirements to deliver quality education blended with skills.

With Technological innovations, we have entered the Transformative Age. Much like the Industrial Revolution before it, one can expect fundamental shifts in how we live, work, etc. The Transformative Age will also change how we learn – and, along with it, the nature and role of the university. It has facilitated the concept of e-classrooms and e-universities. Now it is already labeled as a 'University in the age of Education 4.0'. The future of work will be radically different, driven largely by the machine economy, where robotics and machine learning take over repetitive and programmable human tasks and artificial intelligence augments human roles. When machines become workers, what will humans do? How will universities adapt to remain relevant for the future of work? The challenge before HEIs therefore is to remain relevant for future tasks so that their graduates will be 'work ready'. What will be the stakeholders' demands of our universities in the future? How will universities contribute to solving the challenges of the transformative age? HEIs would have to recalibrate their strategies across all the facets to remain relevant in the age of Education 4.0.

The ecosystem of higher education terrain of our country is extremely diverse with uneven hills and valleys of different shapes, heights, and areas. There exists a strong divide between HEIs of rural and urban domains of the ecology. The demography of HEIs ranges from just born to one hundred twenty-five years. Also, institutions of diverse nature with different missions and mandates, etc. have arrived. Further, there exists a wide difference between Centrally- and State-funded public institutions. The need of the hour is a differential instrument to accredit and facilitate the advancement of diversified, specialized HEIs that have different missions and mandates. The Quality barometer is different for different categories of HEIs. The entry of private institutions has added yet another competitive player and dimension to the ecosystem. There is a strong possibility of the

* *Former Vice Chancellor, Bangalore University; and Former Director, National Assessment and Accreditation Council.*

arrival of campuses of foreign universities. When the ecosystem of higher education has changed so much, should not measures of evaluation change? When institutions of diverse nature with different missions, mandates, etc., have arrived, should not the process of reviewing institutions also transform? Since Higher Education is evolving, and the expectations of stakeholders are also changing, the diagnostic tools also need to be innovative.

Now the strategy has to be to impose robust requirements to be eligible and also succeed in getting the accreditation. For instance, the eligibility criteria have to consider that during the previous 3 years a) the leadership position such as Vice Chancellor/Director/Principal should not be vacant not more than three months; and b) at any one time, 75% of the required faculty positions should have been filled up by permanent faculty. Of course, these prerequisites have to be addressed by the central and state governments to make sure that the institutions under their jurisdiction become eligible for accreditation. For affiliating universities, its role in mentoring the affiliating colleges needs due consideration. Other issues that deserve to be included for certification are programme-wise faculty with relevant expertise and infrastructure, programmes with inter, multi-, and trans-disciplinary teaching and research with an emphasis on skills of contemporary interest, provisions for student and faculty mobility, participation in Academic Bank of Credits; benchmarking for research performance to include scientific information flow between industry and academia, the brain circulation patterns, National-International collaborations, context-based citation summary of research articles, the Research and innovation ecosystem with Start-ups, Unicorns, Innovation and Entrepreneur Cell, Incubators, Accelerators, and Co-work spaces, IPR Cell, Information management system, University Society Interaction, etc. With the arrival of Artificial Intelligence and ChatGPT, the accreditation benchmarks also have to be more innovative.

In light of the above narration, the Accreditation process has to be innovative by adapting technology and reimagining with National and International Perspectives and Benchmarks. Accreditation is not to predict the future but to offer multiple plausible "tomorrows" to stress-test new policies, strategies, and plans. It shows ways and means for the transformation of higher education. We must develop and equip HEIs to succeed in the coming decades. Futuristic! Accreditation, akin to the diagnostic process of health checkups, can contribute to the belief that Higher education has to survive today and also get ready for tomorrow's challenges.

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Feedback: An Inevitable Tool for Learning, Development and Transformation

B L Gupta*

In the 21st Century, the focus of higher education is shifting from teacher-centred to learner-centred. Learners are required to be mature to make the right decisions related to the selection of the right educational programme, courses in the programme, the right content, and the right learning process. Higher education focuses on the development of higher levels of learning outcomes in learners in all three domains of learning viz. cognitive, affective, and psychomotor.

The National Education Policy---2020 provided four pillars for designing the educational programmes viz imaginative curriculum, engaging pedagogy, formative assessment, and support to learners (MHRD, 2020). In all four pillars of quality academic programmes feedback to learners from different stakeholders in different forms at different times is essential to harness the learning potential, enrich the learning, achieve the learning outcomes, and ultimately transform them into responsible professionals and good citizens. The feedback for the learning, development, and transformation of learners is integrated with the learning process itself to enrich the learning of the learners and facilitate their overall development. The power of feedback for positive learning is mentioned by ((Black & Wiliam, 1998; and Hattie & Timperley, 2007).

The feedback is used in the systems model to improve the quality of inputs and processes to produce quality products and take corrective and preventive actions to improve the effectiveness, efficiency, productivity of the system, and quality of the products or services or both. Similarly, feedback is an integral element of the learning, development, and transformation process. It is used by design in the learning and development process of the learners to ensure the right learning in the right way. Well-designed and scientifically offered feedback acts as a bio-fertilizer for harnessing the learning and development potential of individual learners sustainably.

* *Professor, Department of Management Education, National Institute of Technical Teachers' Training and Research, Bhopal, Madhya Pradesh. E-mail: blgupta@nitttrbpl.ac.in*

The lessons and messages received by learners through scientific feedback guide them throughout their lives and act as a tool to become lifelong learners. Macnamara (2022) stated that 'feedback is about positive change'. Winne (1994) stated that 'feedback is the information used by learners'. Veloski et. al (2006) stated that 'feedback is status communicated to the receiver concerning standard behavior'. Archer (2010) stated that 'feedback is the information used to promote positive and desirable development'. In the changing context of education, we define feedback as exploring the learning potential of the learners and tapping it to achieve personal and professional goals. We mean integrating the feedback in the learning, development, and transformation processes of the self and group and using it for improving the learning and development process and the learning itself. The scientifically designed and implemented feedback system develops self-learning, and learning maturity, and fosters lifelong learning skills in the learners.

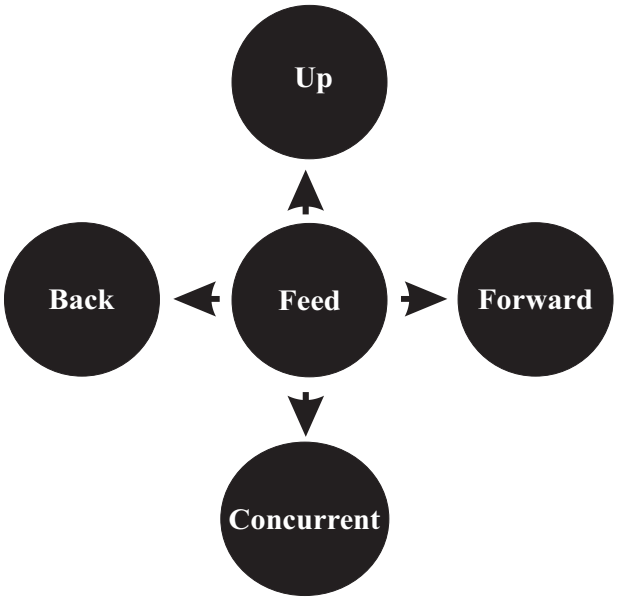
On the contrary, no feedback reduces the effectiveness and efficiency of the learning and development process. In the 'no feedback' situation, the learner is not sure about the right or wrong learning process, learning progress, deprived of recognition of learning, and exploitation of learning potential.

In many learning situations, negative feedback is more dangerous than no feedback as it blocks further learning of the learners, resulting in frustration, demoralization, and discouragement, and causes fear of learning (Obo, 2022). Macnamara, (2022) further classifies the negative feedback into two categories viz negative feedback and negative feedforward feedback.

Brooks et. al (2019) define feeding up, as asking the question where am I going?, feeding back-how I am going? and feeding forward - what do I have to do next? Shute (2007) stated that formative feedback is used to improve learning. Concurrent feedback is generated simultaneously along with

the performance and received from the progress of the task to take corrective and preventive actions. Concurrent feedback plays a significant role in developing affective and psychomotor domain core competencies. The forms of feedback are stated in Figure 1. A necessary and sufficient condition is followed for providing feedback to be impactful for the learning and development of the learner.

Figure 1. Forms of Feed



Types of Feedback

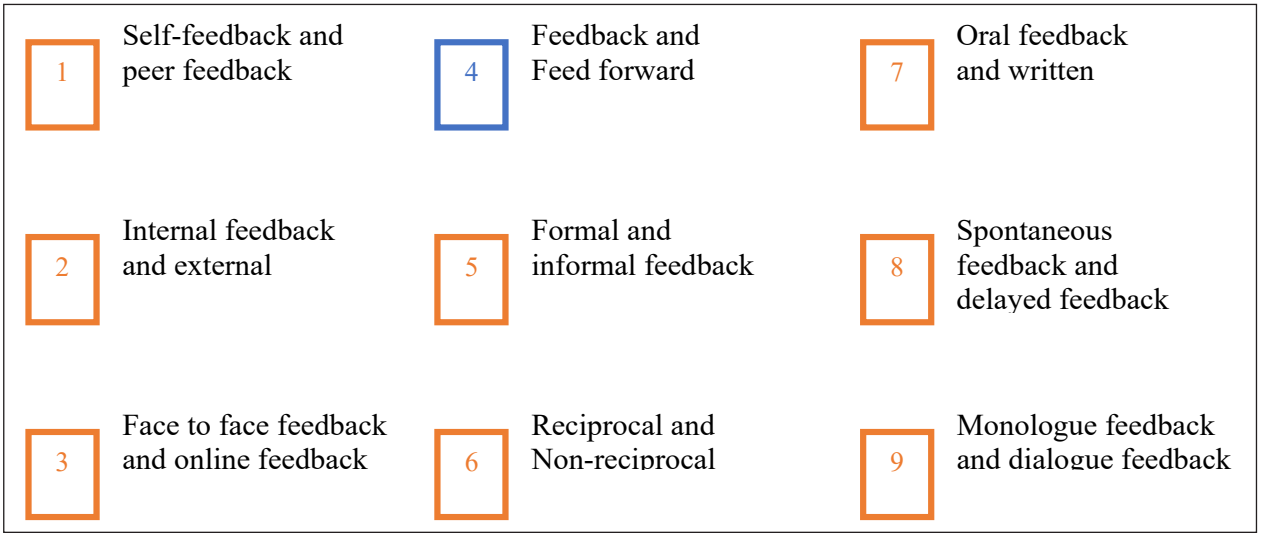
There are various types of feedback used in different learning and development situations with a specific purpose. One or a combination of more than one type of feedback is used in a particular situation to make the learning effective and efficient to achieve the intended learning outcomes. Kutasi (2023) classified feedback as written, oral, online, and peer. The main types of feedback are stated in Figure 2 and briefly described in subsequent paragraphs.

Self-feedback and Peer Feedback

The National Education Policy–2020 emphasises flexible learning, self-learning, and autonomous learning. The learners are expected to learn on their own through online programmes, hybrid programmes, projects, excursions, internships, seminars, and learner clubs. In self-learning situations, consciousness about self-regulation and self-improvement is very important. Learners are expected to diagnose learning gaps and fill these learning gaps by seeking guidance from their peers and course teachers. The skills of taking self-feedback from the learning process and achievement of learning outcomes empower learners to become lifelong learners. They develop maturity for learning related to their career goals.

On the contrary, in learner-centric approaches, learners are involved in performing tasks, activities, projects, discussions, role plays, and research studies. This practice is different from teacher-centric teaching-learning methods. Learners learn on their own and in learning teams and learner clubs. In learner-centric approaches, peer feedback plays a significant role in enhancing the learning experiences of the learners.

Figure 2. Types of Feedback



In most task-based learning situations peer feedback is mutual which enhances the learning achievements of the learners. In learner-centric approaches, peer feedback becomes the means for learning and development and improves learning. In peer feedback, the observers learn through observing the behaviour on predefined criteria and learners learn through feedback. The fish bowl technique, team building exercises, and role plays are the teaching-learning methods in which peer feedback is scientifically used for learning, development, and transformation of learners.

The effectiveness of peer feedback is enhanced by orienting the learners to offer feedback to colleagues during the learning process. Zheng et. al (2020) stated that 'peer feedback is a powerful and efficient technique for feedback but it is refined with training and experience'. The learners are involved in learning, reviewing the progress, and offering and receiving feedback. The acceptability of peer feedback is very high and spontaneous actions are taken by the feedback receiver to improve the learning. The peer-feedback is used for learning and development and not for assessment (Lizzio & Wilson, 2008). The peer feedback may be structured using the pre-defined rubric or observation schedule or it may be unstructured based on the broad observation of feedback providers. Marcoulides & Simkin, (1995) stated that 'structured peer feedback improves the quality of the feedback and learning of the feedback receivers'.

Internal and External

The feedback taken from the progress of the task, activity, assignment, project, and learning situation is immediate feedback for improving the quality of the task, learning process, and learning itself. Internal feedback is always rewarding for learning and development. it is related to self-learning so questions of ego, frustration, and criticism do not arise. The ability to receive feedback on the progress of learning reduces dependency, enhances autonomy, fosters accountability, and develops learning-to-learn skills. Internal feedback transforms the learners into mature learners.

On the contrary, external feedback is required to point out the strengths and weaknesses in the learning process and learning content that individual or group learners fail to identify. External feedback is required for those learners who have external locus of control and fail to make significant decisions. It verifies the learning progress, recognises the learning that took place, and points out those learning strengths and gaps which individual learners fail to identify for further use. It gives the right message at the right time for improvement in the learning process and learning content before it becomes too late for the learners to make corrections.

Face-to-face and E-feedback

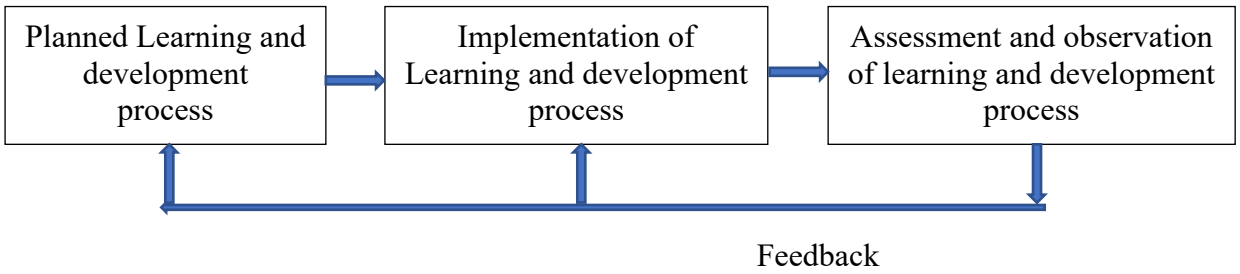
Face-to-face feedback requires a lot of preparation on the part of feedback providers. The message needs to be specific, objective, based on the recent performance, and needs to be given with confidence. It may be immediately questioned by the feedback receiver so the feedback providers should be ready to respond to the questions raised by the feedback receiver. Face-to-face feedback is strong and direct feedback but at the same time, it may be forgotten if not documented. It is always advisable to document or record such feedback for future use.

Online or e-feedback overcomes the limitations of the face to face feedback. The limitation could be non-matching of time, non-availability of the time, travel time is more, and cost of gathering is more. Md. Mamoon-Al-Bashir et. al (2016) stated that 'e-feedback techniques such as email, audio video, screencast, and recycling written comments are used to improve the learning of the learners'. Di & James (2017) stated that Google Drive, TodaysMeet, and Socrative keep a record of all learner feedback and allow every user to read other users' feedback freely'. A strong and direct message provided on digital technology may benefit hundreds of learners.

Feedback and Feedforward

Feedback is a message communicated to a learner or group of learners based on the assessment against expected learning goals, behaviour to be demonstrated, the learning process to be used, skills to be used, relationship to be demonstrated, professional ethics to be followed, assignments to be completed, schedule to be followed, and quality of the task to be maintained to bring improvement in learning and development process and behaviour to be demonstrated by the learners to satisfy the targeted level of quality. In other words, feedback is related to achieving the expected level of quantity, quality, and behaviour. The elements of feedback are stated in Figure 3.

Figure 3. Feedback



On the other hand, feedforward is a message communicated to the learner or group of learners to improve the learning and development process itself to achieve higher levels of learning outcomes without leaving aside learning gaps in other words it is related to increasing the effectiveness and efficiency of the learning process itself.

Feedforward facilitates the learner to know the potential problems and methods to deal with these potential problems. It makes them proactive, responsive, and responsible learners. It helps learners to perform better in the assessment process because they know the assessment standards through feedforward messages.

The feedforward is used by the learners for future learning which is directly related to achievement of learning outcomes. In the past feedforward is used by Carless (2007), Van (2020), and Shafi et. al (2018). They stated that it facilitates future learning. Gjerde et. al (2022) concluded that feedforward i.e. goal-oriented information significantly improved the results of the learners in comparison to feedback on past performance. The elements of feedforward are stated in Figure 4.

Formal and Informal

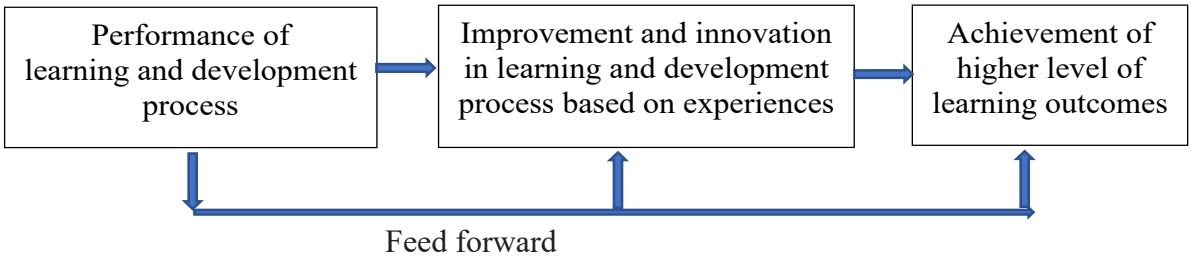
The formal feedback is planned in the academic calendar of the programme and course plan. The formal feedback is offered by the authorized feedback provider based on the assessment and review of the progress of learning and tasks. The assessment of learning is carried out as per a planned schedule and criteria about which learners and teachers are well aware. The formal feedback is communicated in writing. The work of the learners based on the learning is verified by the course teachers. Generally, formal feedback is provided on the progress of the task/assignment/activity, etc.

On the contrary informal feedback is provided at any time during the learning process by peers, course teachers, mentors, and resource persons. Informal feedback is frequently provided in institutions where there is a culture of offering and receiving feedback for learning and development. Informal feedback is spontaneous, unplanned, and non-directive. The feedback providers do not pursue the implementation of the feedback message by the receiver.

Reciprocal and non-Reciprocal

Byl & Topping (2023) stated that 'feedback is used in reciprocal and non-reciprocal peer mentoring situations to achieve social integration, academic commitment, attitude, and persistence'. Reciprocal feedback is informal feedback and it is commonly used in team learning situations such as group discussion, role play, project, and problem-based learning. Reciprocal feedback provides

Figure 4. Feedforward



recognition of achievement, and mutual support for learning and development. It is commonly practiced in cooperative and collaborative learning approaches and peer mentoring situations. Formal reciprocal feedback is used to improve the learning process of the learners so it is given to the teachers and mentors by learners to improve the instructional and mentoring process.

On the other hand, non-reciprocal feedback is provided in formal learning and development situations by course teachers and experts to use the learning strengths and overcome learning and development problems. It is offered in a directive and suggestive way. It is offered for developing core and critical skills related to discipline and cross-discipline. In online learning and development programmes, it is extensively used.

Oral and Written

The oral feedback is difficult to articulate spontaneously and difficult to offer as it encompasses the mood of the feedback provider and receiver, receptivity, and acceptability. The oral feedback is immediately lost before learners work on it. The long oral feedback creates complexity in the learning process and confuses the learners. Oral feedback is like listening and forgetting. It has a temporary impact on the learning process and learning outcomes.

On the contrary written feedback is documented evidence that can be referred to by the learners frequently to bring improvement in the learning process and achieve learning outcomes, written feedback can be discussed with the feedback provider or with other experts, and actions for improvement may be taken. There is strong and direct evidence for feedback providers and feedback receivers that feedback has impacted or not impacted. Corno & Snow (1986) stated that written or computer-delivered feedback is less biased.

Spontaneous and Delayed

The learners want to verify the learning process they have adopted and the learning content they have comprehended. They want immediate knowledge of the learning outcomes they have developed. They want recognition and appreciation, and at the same time, they want to know the mistakes they have committed. In day-to-day situations, spontaneous feedback is very important to enhance the motivation of learners to achieve learning outcomes. Spontaneous feedback helps learners to learn difficult tasks and prevent stuck-up and demotivation towards learning (Clariana, 1990, Knoblauch & Brannon, 1981).

Shute (2007) stated that for procedural and conceptual knowledge and difficult tasks use immediate feedback. It is a kind of feedback offered to learners by teachers, peers, and resource persons during the performance of the task/activity. It is useful to immediately correct the learning and use it in future performance. Spontaneous feedback plays a significant role in developing psycho-motor skills and affective skills. It is required in developing crucial skills such as safety, hygiene, housekeeping, operation of a machine, and calibration of equipment.

On the contrary delayed feedback is important in learning situations where the learners want to develop higher levels of learning skills and learning outcomes. The learners are expected to reflect on the learning process and learning outcome and decide on their own. In learning methods such as problem-based learning, project-based learning, seminars, internships, action learning, and research delayed feedback develops a higher level of skills in the learners. Delayed feedback makes learners reflect, think, struggle, and generate solutions to the situation. Schroth (1992) stated that 'delayed feedback is associated with better transfer of learning'.

Suggestive and Directive

In the adult learning process, suggestive feedback is preferred rather than directive feedback during the learning process. The learners are developed to make their own decisions and judgments on what they are learning and how they are learning. Suggestive feedback is comparatively soft which is well received and accepted by the learners.

On the contrary directive feedback is important in situations where correction in the learning process and content is important. It is used in critical psychomotor skills development and affective domain learning outcomes where wrong learning or learning less than mastery is risky for the learners and others in real-life situations. Directive feedback is also provided to those learners whose locus of control is external.

Monologue and Dialogue

It is a kind of feedback offered by the teacher to learners in written form may be on assignments, reports, and projects submitted by learners as an integral element of the teaching-learning process to achieve learning outcomes. In many feedback cases understanding the intent of the written feedback by learners and using it for improving the learning process and learning outcomes becomes difficult.

Dialogue is a kind of feedback offered to the individual or group of learners in an open environment of learning where learners may seek clarification on the feedback and further guidance for improving the learning process and learning outcomes. The whole group of learners benefits from dialogue type of feedback which they may refer to repeatedly. It is said that conversational feedback is more effective in learning and development situations.

Strategies for Providing Feedback

The strategies for providing feedback are designed along with the preparation of the course and session plans. There are several elements incorporated in the strategy design such as the content of the feedback (focus on learning and development process or learning outcomes), time of providing the feedback (significant stages of learning), mode of providing the feedback (verbal, non-verbal, written, graphical, electronic, direct, indirect) purpose of providing the feedback (improvement in learning and development process, improvement in project/task/assignment/ activity, and achieving a higher level of learning outcomes), quantitative or qualitative (repetition of desired behaviour in measurable terms or improving the quality of the behaviour to make it more acceptable) (Esther & Yaw, 2023), feedback by stakeholders (self, peer, group, course teacher, resource person), feedback to the individuals or groups, and so on.

Giving answer strategy (GAS) is a strategy in which the learning gap and answer to fill the learning gap is provided by the teacher. Learners are expected to simply act on the suggestions of the teacher to improve their learning or develop a higher level of learning. Prompting Answer Strategy (PAS) is a strategy where learners are provided cues, stimuli, hints to find the solution to the problem and improve the learning process, and develop a higher level of learning outcomes.

The feedback strategy may be a pull or push strategy considering the learning style of the learners. The pull strategy focuses on developing challenges for achieving a higher level of learning outcomes and developing it in a given time. The push strategy focuses on creating motivation to learn and develop predefined learning outcomes in a given time.

Brooks et. al (2019) suggested a matrix for three learners stages viz novice, proficient, and advanced. The strategies are stated for task, process, and self-regulation. The strategies are mentioned for feeding up, feeding back, concurrent, and feeding forward.

1. At the institute level policies should be formulated and implemented for giving and receiving feedback in the context of provisions of the National Education Policy 2020. A guideline document should be prepared at the institute level for teachers and learners to offer and receive feedback for learning and development.
2. The role of the course teachers/resource persons should be defined to ensure the effective implementation of feedback policy and guidelines.
3. Teachers and learners should be oriented on providing and receiving feedback for developing multidisciplinary skills, research skills, and higher-level skills. At the institute level workshops, role plays, and experience-sharing sessions should be organized for teachers to provide the right feedback to learners at the right time in the right way to help them achieve course and programme outcomes. Shum et.al (2023) recommended that the teachers and learners literacy for using the automated feedback tools should be enhanced. They developed literacy competencies for teachers to use the automated feedback tools effectively.
4. Create a healthy culture and practices for giving and receiving feedback to improve the academic environment of the institute. Ramani & Krackov (2012) stated that feedback should be an integral part of the learning process and culture of the institute.
5. Prepare short videos on various aspects of providing and receiving feedback and provide the link of the same to the teachers and learners.
6. Video record important feedback sessions in different learning methods such as group discussion, case method, problem and project methods, and

seminars. Reflect on the content and process of providing feedback and think about improving the same.

7. Use technology to augment the effect of feedback and depersonalize it in learning and development situations where the face-to-face situation of giving feedback has its limitations.
8. Organize experience-sharing sessions and workshops to improve the practice of giving and receiving feedback.
9. Publish the significant experiences of providing and receiving feedback in the form of a report, case study, anecdotes, and incidences. Also, publish the tools and techniques developed for improving the feedback effectiveness and learning and development of the learner.

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Internationalising Higher Education using Holistic 'Shared HEIs Ecosystem' to Access Quality Higher Education through the Lens of 'Agarwal-Ganesh International Teaching Model'

Mohammad Ilyas* and Ruchi Payal**

Higher Education Institutions (HEIs) play a pivotal role in the socio-economic transformation and human capital development of a nation (Lentjushenkova, 2021). In the modern context, the internationalization of higher education has become a crucial aspect globally, driving the restructuring of educational systems to produce skilled human capital with a business-oriented mindset. This international dimension is essential for institutions due to the increasing cross-border mobility and the impact of globalization on the working culture, which is progressively entrepreneurial, international, and professional (Varghese, 2020). Contemporary HEIs are tasked with a significant responsibility to enhance international and intercultural experiences, skills, and competencies essential for individuals to thrive in a globalized work environment. By embracing internationalization, HEIs can equip students with the necessary tools to succeed in diverse settings worldwide, fostering a culture of adaptability, cross-cultural understanding, and professional readiness. This shift towards internationalization not only enriches the educational experience but also prepares individuals to navigate the complexities of a globalized economy, promoting innovation, collaboration, and a broader perspective on societal challenges and opportunities.

Contextual Setting of the Shared HEIs Ecosystem

On April 14, 2024, during the 98th AIU Annual General Meet and National Conference of Vice Chancellors in Hyderabad hosted by the ICFAI Foundation for Higher Education, Mr. Anil P. Agarwal (Chairman EdifyOnline) and Dr. L.S. Ganesh (Vice Chancellor, ICFAI Hyderabad) discussed about Internationalizing Higher Education, a provision of NEP-2020 policy. Mr. Agarwal explained the importance of placing teachers and students at the center stage, a key aspect of the holistic catalyst approach outlined in his white paper of August 09, 2022, which was then formatted as a proposal and submitted to the Association of Indian Universities (AIU) for working on a joint project. The proposal was accepted by the Secretary General of AIU, Dr. Pankaj Mittal and the project 'University Cluster Pilot Study (UCPS)' took off successfully. The Joint UCPS initiative is being conducted by the research division of AIU and EdifyOnline with the cooperation of participating HEIs and the learners. He highlighted that a holistic catalyst approach would involve Indian faculty members serving as the bridge between foreign experts and their students, ensuring a seamless integration of knowledge and guidance. He added that the approach aims to facilitate the exchange of knowledge between Indian and International academics to Indian students at scale through a collaborative framework of 'Shared HEIs Ecosystem' @affordable cost. The implementation of this Shared HEIs Ecosystem will be tested and validated by the outcomes of the UCPS initiative. It is expected that the UCPS initiative will open the doors for future research and innovations.

Dr. Ganesh acknowledged the merits of this holistic catalyst approach but raised a valid concern regarding the maturity level of Indian undergraduate students, who are typically around 18 years old. He questioned whether the direct involvement of foreign faculty in lecturing Indian students might result in a learning misalignment due to the students' perceived lack of maturity. In response, Mr Agarwal emphasized that the holistic catalyst approach specifically includes the participation of Indian faculty members. In this model, the Indian teachers would not only listen to the lectures delivered by foreign experts but also continue

** Research Fellow, Joint Project, Association of Indian Universities—EdifyOnline, AIU House, 16 Comrade Indrajit Gupta Marg (Kotla Marg), New Delhi-110002. E-mail: edifyonlineaiu@gmail.com*

***Research Fellow, Joint Project, Association of Indian Universities—EdifyOnline, AIU House, 16 Comrade Indrajit Gupta Marg (Kotla Marg), New Delhi-110002. E-mail: edifyonlineaiu@gmail.com*

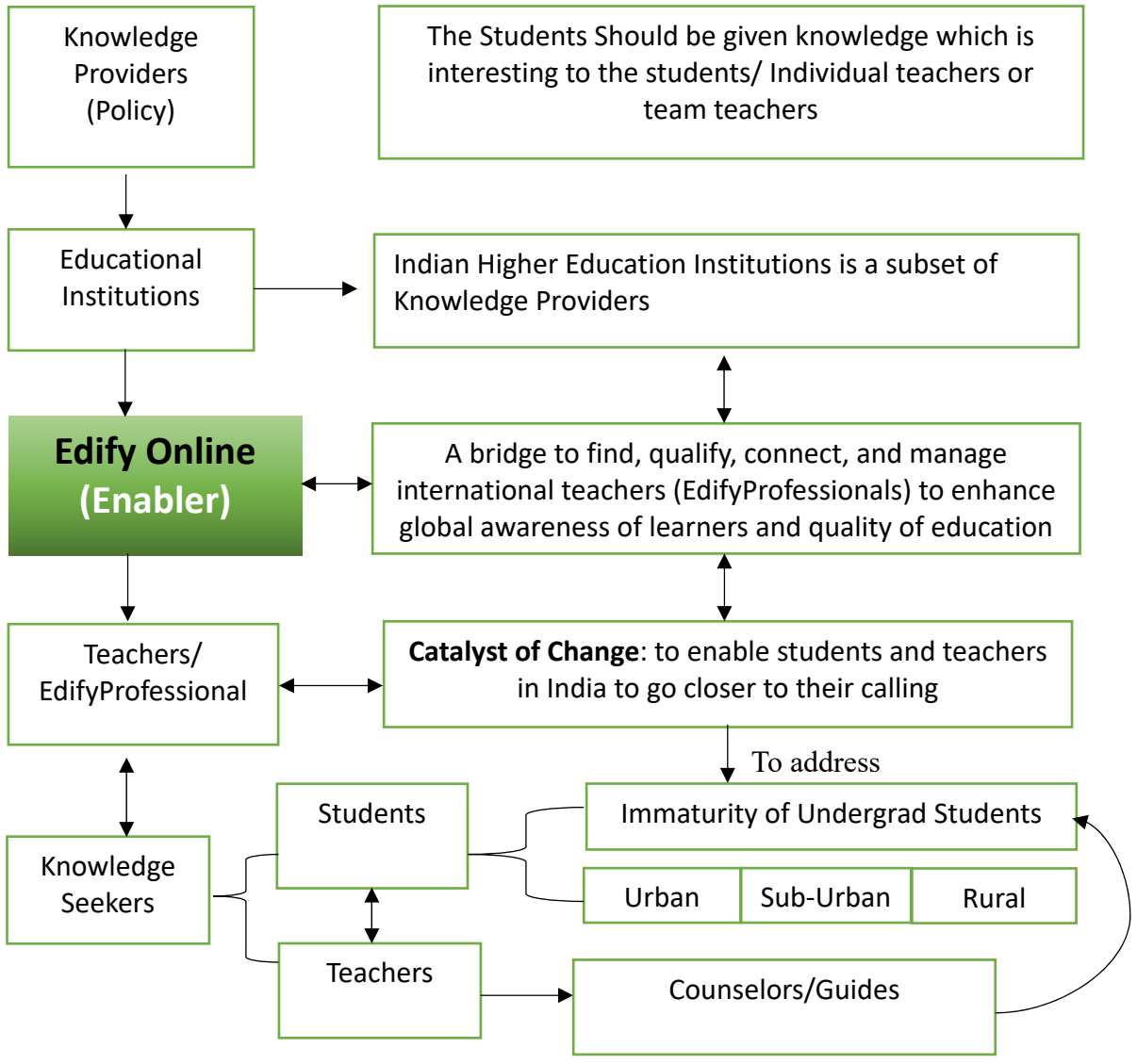
conducting their discussions and assessments with their students as usual. This approach would allow the Indian faculty (mature individuals) to serve as counselors and guides for their young or immature students, bridging the potential gap in maturity levels.

Agarwal-Ganesh International Teaching Model *(Using Shared HEIs Ecosystem)*

Inspired by this discussion, Dr. Ganesh proposed a pictorial representation of the 'Five-layer model of shared HEIs Ecosystem' that would clarify the concept and the implementation of the holistic catalyst approach (Figure—1). This model envisions a comprehensive framework that would address the various stakeholders and components involved in the knowledge exchange process.

The Agarwal-Ganesh International Teaching Model (2024) talks about the five layers of education (international education) where professors of practice or Edify professionals will provide the knowledge to those who seek it, and that knowledge is attractive to the students, teachers, and team teachers. This set of layers will lead to another layer called educational institutions, which will serve as the link between Professors of practice or, we can say, knowledge providers. The Indian higher education institutions will serve this purpose, and these will be a subset of knowledge providers. After this layer, there is a missing

Fig—1: Agarwal-Ganesh International Teaching Model



link that will connect the above with knowledge providers and seekers, who act as a catalyst to make that change in the educational landscape. The fourth layer that we talked about is making a change and the elements are Edify professionals or teachers who will act as a catalyst of change in Indian higher education. The next and final layers are the most essential elements of this Agarwal-Ganesh International teaching Model: the knowledge-seekers who are both teachers and students at Indian universities. Students in Indian higher education institutions would be classified into rural, urban, and suburban categories. The students at this level, as per the Agarwal-Ganesh International teaching Model, are immature, and they need expert guidance from professionals and teachers. These professionals and knowledge providers will help the students by providing them with knowledge that will expose them to opportunities for a better professional career. So, to make this all happen, the missing link between the knowledge providers and the knowledge seekers will be bridged by Edify Online which will find the professional or we can say catalyst of change, who qualifies and connects with these knowledge providers and knowledge seekers to nurture the Academy talent – the very purpose EdifyOnline promotes "*Everyone has the right to be enlightened.* It just takes the right teacher®".

Striving for Quality Education Together

If we think of higher education institutes as a grand adventure, where every child is like a young explorer, setting out on a journey of self-discovery. These students come from all walks of life, each with their own hopes and dreams, yet many are uncertain about the path ahead. Alongside them are the teachers, the seasoned guides who not only impart knowledge but also share in the excitement of learning something new every day. It is a unique space in itself where the provider is also a seeker at the same time.

And then there are higher education institutes, the bustling hubs of activity where students and teachers alike gather to embark on this shared quest for knowledge. The leadership of these institutes, their vision, the administrators, and management team are the backbone of the institute that are responsible and accountable to provide the students quality education that not only encourages them to go beyond the books but also help them in providing a decent lifestyle through knowledge. Although there are multiple entities who support and guide the students outside of the formal education structures, but there is no surety in its availability, so at least the institutes should build themselves quite strong.

But this journey is not just about individual growth—it is about shaping the very fabric of society. With every lesson learned and every milestone reached, these young explorers contribute to the tapestry of their communities and the progress of their nation. And as they continue on this journey, they carry with them the collective hopes and aspirations of generations past, forging a path toward a brighter tomorrow.

Every entity involved and level has a unique significance in the education system of the nation. But it's not a linear progression. Rather, it is a complex and multiple interaction process that takes place between institutes, teachers as knowledge providers, teachers as knowledge seekers, students, management, and the global market. There is a constant pull and push that goes on among them that creates different learning outcomes. If not managed appropriately, mostly, it is seen that the quality is the first thing that is compromised.

Due to multiple reasons, for this interaction, multiple challenges arise, and multiple gaps are created, given the increasing population and limited resources. it is not the same for the first-generation learners and the top-notch section of society that have access to every advanced facility. Even those who have all the facilities are sometimes not able to find what their area of interest is.

Students

Many students feel like they're wandering in a huge maze, struggling to figure out what they want to do. Especially for undergrads, it's like they're stuck in a bubble that's just an extension of high school—a safe space that's comfy but doesn't prepare them for the real world. A lot of them feel like they're not smart enough or motivated to learn, but that's not the real issue. The problem is more about being mentally stuck. It's like their brains are craving something more nourishing, like curiosity, critical thinking, and finding out who they are. To help them, we've got to change how we help them think. If we create spaces where they can explore freely, get creative, and think for themselves, we can help them break out of this mental rut. With new and exciting ways of teaching and support systems that look out for the whole

person, we can inspire them to see the awesome potential they've got inside and to start their journey of learning and self-discovery. It's not just about throwing facts at them—it's about lighting a spark that makes them hungry to understand the world and to tackle whatever comes their way with confidence and purpose.

In the context of student choices, the presence of immaturity among graduate students can be viewed as an opportunity for growth, reflecting openness and flexibility in exploring various academic paths. With the diverse course offerings by Edify Professionals from around the world, students are presented with a wide array of options to discover their interests and make informed decisions about their academic pursuits. This comprehensive approach not only facilitates students in identifying their passions but also aligns them with suitable educational pathways, enhancing their academic journey and overall learning experience. As the UCPS Initiative progresses, we will be looking at the areas of the immaturity levels of students based on their geographical location.

Teachers

In the world of teaching, it is a common tale to find folks who sort of stumbled into the profession, maybe because it offered a stable paycheck rather than because they were passionate about shaping young minds. Even those who aced exams or topped competitive tests aren't automatically great teachers—they might have the book smarts but not necessarily the knack for explaining stuff in a way that clicks with students. It's like having a toolbox full of tools but not knowing how to use them properly or finding a bunch of teachers who can cater to all the different learning styles and needs of students. That is like trying to fit a square peg in a round hole—it is tough.

But it's not all gloom and doom. With some solid guidance, ongoing training, and a real dedication to the craft of teaching, educators can rise above the challenges. It's not just about what one knows, but how one shares that knowledge—lighting up young minds, sparking curiosity, and making learning a lifelong adventure. It is worth noting that teachers themselves can sometimes be limited by their own experiences and cultural backgrounds. They might be used to teaching in a certain way that works for them but might not resonate with every student. It's a constant give-and-take—they are teaching, but they are also learning along the way. And just like their students, they can benefit from exposure to diverse perspectives, ongoing learning opportunities, and a willingness to adapt their approach to meet the ever-evolving needs of their classroom community. After all, education is a journey for both teacher and student alike, filled with moments of growth, discovery, and mutual understanding.

Higher Education Institutions

The institute serves as a common point where education seekers and providers meet. This interaction isn't solely a result of dedicated efforts; it is a delicate balance of numerous factors. For example, these factors may include the institute's vision which shapes its goals and direction, as well as, the leadership that guides its implementation. Additionally, the effectiveness of the institute may be influenced by its administration which is responsible for ensuring smooth operation and its management and overseeing various aspects such as resource allocation and policy implementation. Financial resources play a crucial role, in determining the extent of services and opportunities available. Spending priorities reflect the institute's values and commitments. Furthermore, the diverse backgrounds of faculty and students enrich the learning environment, contributing different perspectives and experiences. The geographical positioning of the institute also affects accessibility and opportunities for engagement. All these factors intersect to create the dynamic ecosystem of the educational institution.

University Cluster Pilot Study

The purpose of the University Cluster Pilot Study (UCPS) initiative is to gain insights into the challenges, gaps, and opportunities in implementing the 'Shared HEIs Ecosystem' using international academic talent that may directly or indirectly influence the learning outcomes. Its mission reaches far and wide, touching various aspects of education and cultural exchange. By bringing together faculty members from different corners of the globe, it creates a diverse array of perspectives and experiences within educational institutions. Through this initiative, educators and learners alike have the opportunity to interact and learn from each other, discovering new approaches to teaching and learning that transcend borders. It's like opening a window to the world

without ever leaving your classroom. We often hear that success isn't just about avoiding failure but also about staying ahead of the curve, knowing what others are doing, and learning from them. The UCPS initiative embodies this principle, serving as a bridge between local educational communities and the global stage. It keeps everyone informed and up-to-date on the latest trends and innovations in education, ensuring that no one is left behind in the pursuit of knowledge and excellence.

Concluding Remarks

Dr. Ganesh emphasized that the holistic catalyst approach proposed by EdifyOnline would fit seamlessly into this five-layer model, as it addresses the core elements of knowledge exchange, faculty development, and student-centric learning. By integrating the holistic catalyst approach within this comprehensive framework, the UCPS initiative would be poised to achieve its objectives of fostering collaborative learning, enhancing faculty capabilities, and ultimately, empowering Indian students to thrive in the global academic landscape. By considering the various stakeholders, institutional dynamics, and regulatory factors, the five-layer model, combined with the holistic catalyst approach, presents a robust and comprehensive strategy for driving meaningful change in the Indian higher education system.

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Gender, Science and Technology

Dinesh Kumar Gupta*

Science (from the Latin *scientia* meaning knowledge) refers to a system of acquiring knowledge that uses observation and experimentation to describe and explain natural phenomena. Technology (from the Greek *technologia* – techne, an art, skill or craft, and logia, the study of something, or the branch of knowledge of a discipline) is the usage and knowledge of tools, techniques, crafts, systems or methods of organization in order to solve a problem or serve some purpose. Technologies have to satisfy requirements such as utility, usability, and safety.

Basically, science and technology deal with different techniques and methods aimed at enhancing the welfare of mankind. Both science and technology have been integral to Indian culture. The history of philosophy, scientific discoveries, and development in India dates back to the Vedic era. It was India that gave the world the concept of zero in mathematics, distillation, and perfumery in chemistry and yoga and Ayurveda in health care.

In fact, India was ranked fifteenth in Science and Technology systems output in the year 2003, but later it managed to make it to the top ten list of Science and Technology systems in the world. It rose to the ninth position on the world's Science and Technology map in the year 2010. The Indian government has declared 2010-20 as the "Decade of Innovations" with the hope of increasing wealth and employment for the country using scientific research and innovation. At present, the government is taking major steps to make India a major global science power.

There is no denying that Science and technology education can be the gateway to national development and poverty alleviation. All sectors of society must be seen to participate optimally in it, including girls. This module targets serving teachers whose roles and work have a direct influence on learners of school-going age and thus on the future of society as well.

It will address gender issues in science and mathematics classes and schools in general to remove personal and cultural obstacles placed in the way of girls that inhibit them from choosing science subjects, from performing well in them and ultimately from choosing science-related careers. The gender disparity is palpably evident in the education sector which hits inclusive growth very adversely. Recognising this, the present paper aims to address the factors accounting for gender disparity prevailing in our education sector, with a special focus on science. The underlying assumption is that although science and technology bring economic growth, enhancement in these fields is possible through women's empowerment and maximum participation of women.

There is a need for fostering gender equality and empowerment in science and technology. Gender is not just a women's issue, but rather a people's issue. Femininity does not exist in isolation from masculinity. The capabilities of a nation comprise the skills and knowledge of all sections of its people. Therefore, any society cannot reach its true potential and a nation cannot develop when half of its population is kept out of activities and professions that are constructive, just as a chariot cannot travel on a single wheel alone. The scientific contributions of any community or nation reflect its level of development. The present module is thus also designed to enhance sensitivity and awareness about gender equality and empowerment in science and technology. An attempt has been made to describe various ways in which teacher educators, in particular, can foster gender equality and empowerment in science and technology. It is well established that science and technology can bring in knowledge gain, attitudinal reconstruction, behavioural change, and build capacity in a manner that facilitates the empowerment of women. Women can become informed decision-makers and change agents.

Description

The profusion of resourceful and passionate scientific talent of women makes one optimistic about the future of India. Such prodigious talent can catapult India not only to the forefront of scientifically advanced nations but also enhance its image as a country that advocates women's advancement. The

* *Assistant Professor, Agrawal Mahila Teacher's Training College, Gangapur City (Rajasthan) 322201. E-mail: dineshg.gupta397@gmail.com*

important issues which affect the current status of science in the country include:

(a) Poor enrolment of devoted young people in science education,

(b) Declining trend of Indian scientists' contributions at international academic level

(c) Scale of investment in science in State and Central Universities

(d) Lack of growth of institutions of excellence

(e) Lack of freedom of operation in scientific and higher educational institutions.

The Scientific Research publications clearly show considerable improvement in the (c and d factors mentioned above) over the last twenty-five years. The absolute number of research publications has gone up from 14983 in 1980 to 19448 in 2005. However, India's contribution in terms of a percentage in the larger stead of world publications has declined from 2.9% in 1980 to 1.9% in 2005.

It is seen that despite unfavourable socio-economic conditions that prevail, women's education in India has progressed and its effect is manifested in the overall progress of education in India. An educated mother is always the foremost motivation for her ward's educational upliftment. But even beyond the realm of general education, the achievement of Indian women in science has been significant. The glaring reality is that women's contributions on the domestic and career front have always been obliterated. The very fact that they take on the double or triple burden of homemaking, work outside the home, and fight male chauvinism often goes unnoticed and unrecognised. Among the various professional spheres, women seem to miss out more in science and technology, particularly physical sciences and engineering fields. Those who do study science often end up in what are considered less challenging teaching jobs.

The present statistics indicate that a large number of women in India are involved in scientific study and research competing on equal terms with their male counterparts. Women now constitute about 40% of all science and technology students in higher education. In educational and research institutions, they share about one-third of the positions in science and technology. In medicine and information technology too, they are present in large numbers. Despite the heart-warming statistics, it is well known that a lot more potential yet remains to be tapped. Several factors contribute to the decreased participation of girls and women in science and technology education. Girls are seen to be unwilling to participate in science-based activities primarily due to lack of motivation. It seems to serve no instrumental purpose for them. Other factors include a lack of relevant policies, inadequate curriculum content and delivery, biased teaching materials, and negative socio-cultural attitudes and practices. It is therefore appropriate that the goal of gender parity in science and technology should rely on a mix of strategies drawn from lessons learned from the best practices and experiences at national, regional, and international levels.

As per the National Policy for the Empowerment of Women (2001), there is a commitment to strengthening programmes that bring about greater involvement of women in science and technology. These include measures to motivate girls to take up science and technology for higher education and also ensure that development projects with scientific and technical inputs involve women fully. Efforts to develop a scientific temper and awareness will also be stepped up. Special measures have been taken for their training in areas of special skills like communication and information technology. Efforts to develop appropriate technologies suited to women's needs as well as to reduce drudgery are also being given special focus.

The major initiatives taken by the government to encourage women in science and technology may be summed up as follows:

- Equal access to participation and decision-making of women in social, political, economic and development activities
- Equal access of women to health care, quality education at all levels, career and vocational guidance, employment, remuneration, occupational safety, social security, etc.
- Strengthening legal systems aimed at the elimination of all forms of discrimination against women.
- Changing societal attitudes and community practices by encouraging active participation and involvement of both men and women.
- Adopting suitable measures to enable women to work during night shifts in factories

- Drawing up women-friendly personnel policies to encourage women to participate effectively in the developmental process
- Provision of support services for women like child care facilities including day care facilities at workplaces and educational institutions, homes for the aged, the disabled, etc.

These measures need to be expanded and improved to create an enabling environment and to ensure their optimal contribution to social, political, and economic life. Several initiatives have been taken to attract girls and women to science and technology education. They include promoting gender mainstreaming in policy and programmes for science and technology, instituting incentives such as scholarships, and award systems in specific clusters of science and technology, offering special internships for female students, strengthening career guidance at institutions of learning, establishment of mentoring programmes, curriculum restructuring and addressing the role of teachers and parents. Despite these initiatives, sustained efforts are still needed in order to improve the participation of girls and women and their performance in science and technology education and science-based activities. That gender disparity exists at all levels and impacts women's development is an undeniable fact. This is partly due to the biological roles and responsibilities of women as mothers, but mostly due to the traditional mindset, which visualize women as childbearers and homemakers, and men as breadwinners. There is a growing realization that by hindering the creative talent, expression and active involvement of women, in research and development, we are depriving society of its intellectual capital. Therefore, efforts have to be made to make scientific research more gender friendly.

The Root of the Problem

Although girls seem to consistently outshine boys in the board examinations, the enrollment of women in higher education, particularly in science has not kept pace with what the board examination results reflect. Since 1951 there has been a steady growth in universities and other higher education institutions in India. The participation of girls at all stages of education has also been increasing steadily over the years. Yet the wide gap between women and men entering the University persists. Let us analyse some of the problems and issues which explain this.

Attrition

Relatively more women tend to persist with studies after graduation though some attrition occurs at the level of Ph.D. This interesting finding differentiates India from many other developed countries. (At Massachusetts Institute of Technology, USA a survey found continuous attrition as one moved from undergraduate to graduate to post-doctorate and faculty positions.) This has led to some speculation that in India if the "leaky pipeline is plugged at the school level (stopping school dropouts), the presence of women in higher education, including science may increase.

Gender difference in enrollment of boys and girls also varies regionally. Urban women are more likely to gain access to higher education as compared to their rural counterparts. So while their caliber may be the same, timely motivation and grooming make a lot of difference. There is vast evidence to show that the attitudes of parents/teachers influence academic decisions. The Indian National Science Academy (INSA) Report of 2004 found that in states such as Goa, Kerala, Punjab, and Pondicherry, more than 50 % of women enrolled in colleges (2000-2001), but in states such as Arunachal Pradesh, Bihar, Jharkhand, Orissa and Rajasthan less than 35 per cent women did. The enrolments in the other states were between these two extremes.

It is not just motivation and grooming, but the lack of facilities and availability of colleges and universities in the vicinity that cause lesser enrolment of girls from rural areas. Other lacunae are the lack of women's hostels and commuting facilities, among others.

Gender Stereotyping of Subjects in Science and Technology

Another problem similar to the trend in Western countries relates to the disciplines in which women enroll. The highest representation of women is in education. Education, to a large extent, is considered to be the most apt subject for women as it is compatible with other responsibilities of women as mother and wife. This is followed by disciplines like arts and medicine. It is only in the past 15 years that their enrolment has shown an increased trend. Though medicine has been a favorite discipline among females, it is seen that the rate of growth of male access to it is larger and faster. Even in Medicine, women tend to

take up radiology, pathology, and anesthesiology much more as compared to neurosurgery. The INSA (Indian National Science Academy) report says that there is clustering in obstetrics/gynaecology, pediatrics, and pathology for women doctors. Few enter the more lucrative male-dominated specializations like orthopedics, cardiology, psychiatry, etc.

The participation of women in engineering remained almost negligible till the early 1980s. The INSA report quotes a 2002 finding that there is 32 % enrolment in Physics in India. In a report published by NISTADS (National Institute of Science Technology and Development Studies), it appears that there are 61,050 women employed in R&D (Research and Development) establishments, which is 15.6% of the total manpower employed in the country (Department of Science and Technology, 2008). Globally, women tend to go in for the natural sciences more as compared to the perceived to be "harder" disciplines such as Mathematics. So deeply entrenched is this supposed aversion that even the Barbie doll was once made to utter the words that the mathematics class was tough. This is an example of how gender stereotypes are reinforced from an early age…even while a girl child is at play. Today of course there is a laptop carrying Barbie in pink, which hopefully will carry a subliminal message of equality and empowering technology.

Post Education Scenario

Paradoxically, even after having obtained higher education, societal pressures and family obligations affect a woman's chances of getting a job of her choice. Interestingly, professional women's attitudes toward education, employment, and family situations have revealed that most women retain traditional values. This means that economic empowerment does not necessarily translate into independence in other spheres of life. And when they do find employment, most women scientists struggle in a male-dominated workplace that often marginalizes them.

The Struggles of the Pioneers

Many pioneers in the field of science and technology had to face gender discrimination in their journey to success. Marie Curie was denied a place at Kraków University merely because she was a woman. In 1911, the French Academy of Sciences refused to abandon its prejudice against women, and Marie Curie was denied admission as Member by two votes. Then it was Marguerite Perey, a doctoral student of Curie, who became the first woman elected to membership in the Academy over half a century later.

Kamala Sohonie (1912-1998) was the first Indian woman to get a PhD in a scientific discipline. She carried out detailed biochemical studies on three major groups of food items consumed by the rural poor and established their nutritive value. When Kamala Sohonie applied for postgraduation at the Indian Institute of Science (IISc), after completing her graduation from Bombay University in 1933, the institution dismissed her application despite her having topped the university merit list that year. The reason for this was that Sohonie happened to be a woman! After much hesitation, she got admission. Kamala's sincerity led her to do regular research in biochemistry. This was a landmark victory for her. Her struggles made life considerably easier for other aspiring women scientists.

Anna Mani (1918-2001) distinguished Indian meteorologist, former Deputy Director General of the Indian Meteorological Department made significant contributions in the field of meteorological instrumentation and pioneered research in the areas of solar radiation, ozone and wind energy measurements. Anna Mani is a success story to which few women (or men) could aspire. She transcended the delimited cultural and physical spaces available to her although the University of Madras denied her a formal PhD degree.

Social Barriers

There are also several social and institutional barriers to the continuing education of women, especially when it comes to science, technology, and engineering. Gender discrimination is much higher in the scientific and technical fields in India than among social sciences and other fields. Women in all professions are seen to perform the double role of managing a job and domestic responsibilities, which has been commonly referred to as a 'dual burden'. In science, the dual burden is combined with various problems that are specific to the scientific profession. In fact, the prevailing socio-cultural systems in India result in a 'triple burden' for women in academic and scientific careers.

Social Role and Prevailing Mindsets

A woman is still seen primarily as a homemaker. Marriage, not career is perceived to be the primary

goal of women. Although women's employment is becoming increasingly more accepted in society, there is yet an expectation from them that they should shoulder the household/domestic responsibilities, particularly the care of children. This impinges on a woman's career in different ways depending on the nature of her profession, as well as the stage at which her career is poised.

Some women scientists, but not all, incur breaks in their career for child bearing and rearing. Age-related, re-entry difficulties exist for those who take such breaks, so most of them try to rejoin as soon as possible. Paradoxically once again, there is an overt and covert societal assumption that this is actually leading to neglect of the child and places extra burden on the woman's shoulders. The responsibilities of parents, in India at least do not get over when the children grow up. Older children, particularly girls are considered just as a serious responsibility as are very young children. The dual responsibilities faced by professional women are thus quite heavy. Some problems are chronic while others become acute at different career points. Science calls for long and uncertain hours and this often discourages women from taking it up as a profession. Research seeks dedication and a lot of attention which women find difficult to give as they are burdened with other responsibilities.

Women scientists with children are often not eager to conduct fieldwork for extended periods. They may find it difficult to live under field conditions, particularly if the areas do not have basic facilities. They may find it difficult to go on tours except for a limited period. Often they are unable to attend conferences or workshops for special training. Many women are not comfortable traveling on their own and thus senior administrative/management positions that entail traveling may bypass them. In one Indian survey it was found that on average, a male scientist traveled four times as much as his female counterpart.

Most women also do not socialize with their male colleagues with ease, partly because of gender socialization and social restrictions. Personal interactions of women scientists with male colleagues are deeply constrained by standard patriarchal cultural barriers of so-called morality. Women scientists are therefore unable to meet and establish personal camaraderie or networks or jockey for positions. This inability often leads to them getting overlooked. Perhaps the evolution of e-networking can compensate for this to a certain extent. Again, many older women scientists admit that they have self-imposed certain restrictions upon themselves and are therefore willing to take a backseat in their career. Interestingly however, the younger scientists are comparatively more ambitious and have definite career plans.

Institutional Barriers

Institutional barriers include a paucity of financial aid, a male-oriented curriculum and a lack of on-campus residences. Gender insensitivity further compounds the problems that women face. Scientific institutions in India carry an essentially masculine ethos and exhibit vertical as well as hierarchical segregation in terms of gender. Women's participation has been limited and confined to comparatively junior positions.

Unequal treatment and subtle discrimination against women scientists and engineers in the behavioral and interpersonal relations also prevail. Nature (2010) has reported common incivilities that reflect subtle sexism. At scientific meetings, women scientists do not get the microphone to speak and when they do, they are interrupted sooner than loquacious male colleagues.

Also, in Science and Technology women tend to be engaged in "pure research" as compared to administration and management. This means that women have less involvement in the decision-making process of the institution. In many cases, the "pure research" is mostly compilation, collection, and review as opposed to being more analytical and creative. However, while this may not mean much difference in terms of books or papers written; it does mean a sizable difference in the numbers of patents and inventions that men and women file.

Employment of Women Scientists

Gender has figured in important ways in shaping the careers of scientists for centuries. Statistics/ data availed from major Research and Development institutions showed that gender disparity in the male/ female staff selection process was continuing, and females were marginalized in recruitment. The INSA Report 2004 has shown that the Department of Biotechnology (DBT) followed by the Indian Council of Medical Research (ICMR), are the best employers

of women. DBT had almost 32% and ICMR 27% women scientists.

In most cases, institutions included less than 15% of women in their Advisory Committees. The Inter Press Service News Agency report points out that though many women have reached top positions in the Indian Space Research Organisation (ISRO), under the Department of Space, the overall percentage of women scientists is still very low. Women's representation in government-constituted research advisory bodies is also very low. Data shows a range between 0-21 percent.

Unanswered Important Issues

In Western countries, gender-related questions in science have been extensively raised. They range from discussions about women in science to philosophical analysis of the gendered nature of science itself. In India, the status of women in science has still not drawn adequate attention. There are only a few reports and studies on gender and science in India. Empirical research specifically on women scientists is scarce and their research productivity has not been dealt with in particular. The scattered information about the participation of women in science in developing countries focuses more on their access to education and career. Very little is known about the contribution of female researchers to scientific production.

We may thus conclude that gender plays an important role in the shaping of scientific careers in India. Major attitudinal and institutional changes in the structure and procedures of Indian science are probably required. In recent years, however, the Government of India (the Department of Science and Technology and University Grants Commission) has been giving enormous attention to the importance of women's education and is making serious attempts at imparting high-level skills to women. Special scholarships and awards have been instituted to attract students in general and women in particular to the science and technology stream.

Nature (2010) has highlighted that countries wherein the salaries of scientists are rising rapidly (for example, Brazil, China, and India) are those where job satisfaction is also rising. These nations are also stemming the brain drain and increasing their publications in peer-reviewed scientific journals. More importantly, these countries have made enormous economic progress over the past two decades, showing a correlation between science, salaries and sustainable development. The gender disaggregated statistics confirm that women researchers earn significantly less than their male colleagues. These gaps are particularly alarming for leading industrial nations such as Japan and Germany. What remains to be seen is whether, with rising salary levels for researchers in China and India, the same gender gap will open or not. Hopefully, more balanced conditions will emerge in the 'Asian century' ahead.

Methodology

Active and interactive methods of participatory learning will enable both teachers and students to gain a deeper level of understanding of the issues involved and to internalize them, so as to bring about a change in thinking, attitudes, and behaviour patterns. Catching them young when their minds are not yet set into stereotyped thinking and behaviour patterns is a key element. These transformed young Indians will then become the citizens and builders of the emerging new India.

Basic education is a catalyst for social change. Education provides the critical key to open many doors of opportunity to life and living, for gaining life skills leading to jobs, and becoming empowered to avail of and participate in the larger dimensions of life. Beyond literacy, it is the quality of education that enables women to become aware of and participate in the many affairs of life. Gender-responsive teaching of Science and technology should thus attempt to:

- identify and prioritize the elements of teaching that should be addressed;
- identify existing gender biases;
- develop training programmes aimed at eradicating biases.

How Teacher Educators Can Promote Gender Equality in Science and Technology?

Gender biases start at an early age, much before a child enters school. Teacher educators play an important role in the life and education of teachers, as they are responsible for their capacity building and shaping their careers. Teachers and teacher educators can both play a major role in eradicating gender differences in science and technology at the school level which in turn can help to create a relatively unbiased society. The following steps

should be followed by teacher educators to make science teaching interesting, to attract young minds, and to inculcate scientific temper in them to help them choose a career in science and technology.

Examples and Pictures

Use of examples of women scientists as compared to male scientists. When the word scientist is said aloud, a picture of a male scientist like Newton or Einstein comes to the mind of the students rather than female scientists like Madam Curie. Examples of women scientists can motivate the minds of young girls. In our laboratories the pictures of male scientists are more prominent. The pictures of female scientists, especially Indian women scientists like Kalpana Chawla can be introduced as subliminal and suggestive images.

Illustrations and Colourful Diagrams

The use of illustrations and colourful diagrams to explain scientific phenomena and experiments and including certain life-skill activities, etc. can attract young minds. Making them aware of how science is related to day-to-day activities develops a scientific temper in them.

Science Activities

Certain science activities could be included to build the interest of students in science. A few examples of science activities are given below:

- Making paper or polystyrene models of simple molecules
- Caring for a laboratory fish tank.
- Making a long poster display showing the main periods of the geological timescale
- Demonstrating Ohm's Law for a fixed resistor.
- Making a periscope
- Talking in groups about how to mitigate the impact of HIV and AIDS.
- Setting up and using a pulley system to lift a heavy load
- Drawing the image of a cell seen under a microscope.
- Discussing how global warming might influence the climate of southern Africa.
- Separating salt from a mixture of sand and salt
- Growing a large copper sulphate crystal

Contextualizing Science Topics

Contextualization of science means, 'teaching science through its applications'. Some contextual ideas are as follows:

- Use the context of what makes clothes comfortable in cold weather via the insulating properties of different fabrics to the concept of conduction of heat.
- Use the context of water to illustrate a variety of different concepts according to phase. These could include solubility, energy, changes of state, pollution, density, pressure, etc.
- Use the context of the refrigerator to study phase changes, particle theory and latent heat.
- Use the context of growing crops as a starting point for a variety of biological concepts such as photosynthesis, plant growth, soil structure and types, energy flow in living systems, food chains, environmental conservation, etc.

Biographies of Women Scientists

Students should be made to work on projects such as the biographies of women scientists, their journey from being a student to a scientist, and the hurdles they faced and how they dealt with them to attain that position. Such assignments will motivate them to take up a career in science and technology.

- Science textbooks show gender biases in the content and pictorial representation that should be addressed in the class. Describe a female student performing an experiment rather than a boy student.
- Leadership qualities in girls should be developed to enhance their confidence level. Make them speak on certain topics related to science. Encourage them to share any scientific experiences in their life or any innovative ideas.
- Science exhibitions should be conducted annually. Girls should be encouraged to participate. Students should be allowed to bring about innovative ideas. Their ideas should be encouraged
- Awareness programmes should be conducted both for parents and students to help them realize the importance of science. Parents should be motivated to allow their girl children to pursue science for further studies.

- Exposure to teacher educators in schools and colleges is necessary to motivate their students. School teachers must work in coordination with college teachers who should in turn have collaborations with universities and research centers. This will help them to become aware of the current status and trends of research and development in our country and abroad.
- The publication of research findings is very important. The students should be made aware of such publications and they should be encouraged to go through them. They will become aware of what has been done in particular areas of research, their limitations and what more needs to be done.
- Women scientists should be identified and they should be publicized as role models. They should be invited as guest speakers for programmes in schools.
- Students should be encouraged to give examples on how science helps in earning a livelihood.
- Choice and role of appropriate technology in relation to women and development become crucial in building up local capacity, to devise solutions to tackle the identified problems to improve their quality of life. The emphasis should be to improve their skills, provide managerial capabilities, and understanding the scientific theories behind the processes/ products. This will make women more open to emerging technologies for improving production efficiency and reducing drudgery in their day-to-day work. Since rural women have a special understanding of natural resource management they can play a crucial role in re-nurturing and re-greening rural India.
- There is an urgent need to use Science and Technology (S &T) to ease women's work. They should be involved as equal partners, their knowledge, experience, and skills must be recognized, for only then they can play a significant role in sustainable development. The systems approach adopted with proper networking to involve rural women as para technologists in the processing and preservation of horticulture produce for value addition and income generation at the village level must be worked upon.
- Students should be made aware of the different awards and schemes of government available at different stages.
- Every educational and research institution must provide a friendly family environment, which will facilitate girls to show quality output.

Recommendations for Teacher Educators

(i) Teachers should explicitly teach students that academic abilities are expandable and improvable in order to enhance girls' beliefs about their abilities. Students who view their cognitive abilities as fixed from birth or unchangeable are more likely to experience decreased confidence and performance when faced with difficulties or setbacks. Students who are more confident about their abilities in math and science are more likely to choose elective math and science courses in high school and more likely to select math and science-related college majors and careers.

(ii) Teachers should provide students with prescriptive, informational feedback regarding their performance. Prescriptive, informational feedback focuses on strategies, effort, and the process of learning (e.g., identifying gains in children's use of particular strategies or specific errors in problem-solving). Such feedback enhances students' beliefs about their abilities, typically improves persistence, and improves performance on tasks.

(iii) Teachers should expose girls to female role models who have achieved in math or science to promote positive beliefs regarding women's abilities in math and science. Even in elementary school, girls are aware of the stereotype that men are better in math and science than women are. Exposing girls to female role models (e.g., through biographies, guest speakers, or tutoring by older female students) along with male role models can invalidate these stereotypes.

(iv) Teachers can foster girls' long-term interest in math and science by choosing activities connecting mathematics and science activities to careers in ways that do not reinforce existing gender stereotypes and choosing activities that spark initial curiosity about math and science content. Teachers can provide ongoing access to resources for students who continue to express interest in a topic after the class has moved on to other areas.

(v) Teachers should provide opportunities for students to engage in spatial skills training. Spatial skills training is associated with performance in mathematics and science.

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Embracing Learning and Growth

Jagdeep Dhankhar, Hon'ble Vice President of India delivered the Convocation Address at the 12th Convocation Ceremony of the Indian Institute of Space Science and Technology, Thiruvananthapuram, Kerala on July 06, 2024. He said, "Never have tension, never have stress, never fear failure; Failure is just a further step to success. If you need any proof, *Chandrayaan 2* was not a failure, it was a stepping stone to the success of *Chandrayan 3.* For fear of failure if you put your entire mind to be a parking place for a great idea you are doing justice not only to yourself but to humanity. So never stop trying." Excerpts

I know it is a memorable moment to be cherished. I am grateful to all of you for that.

The institute alumni have brought honour to their alma mater through their achievements and contributions in diverse fields, and our engagement with them is growing.

I congratulate the alumni. Alumni of every institute constitute a think tank, and that think tank can create wonders. This needs to be exemplified and emulated by alumni of other prestigious institutions.

I have long believed in the idea that we must have a confederation of alumni associations. If there is a confederation of alumni associations of prestigious institutions like yours, like IIT, IIM, JNU, and many more, trust me, it will be a global think tank, and it can contribute to our policy-making. A beginning has to be made somewhere; no place is better than this.

It is the people who serve as the true building blocks of an institution. They are what makes an institution what it is.

Infrastructure is vital but not the spirit, not the essence. Therefore, it is the human resource, the strength of the faculty that determines the spinal strength of an institution. You are blessed to have such remarkable and capable faculties.

Hon'ble President, Chancellor, distinguished faculty members, dear students, their family members, their friends, the staff, and every part of the human resource associated with this institution, my greetings, my salutations.

It is an unusual pleasure for me. I have imparted convocation addresses and not imparted on some occasions. As Governor of the state of West Bengal, I was Chancellor for about three dozen universities and visited 11 universities. This occasion is very different because the institute is very different. Its mandate is different, its vision is different, and its vision is relatable to the ground reality of our growth structure. I am, therefore, grateful to the Indian Institute of Space Science and Technology (IIST) for affording me this valuable opportunity to interact with young minds that will shape the destiny of this nation.

Many things related to space and science is abstract. We are unable to know the dimensions of it, but what is enigmatic and abstract for others is in your heart and mind to make it tangible and ensure it adds to the betterment of the lives of a billion people in our country or more. This institute can take pride in being Asia's first space university, and I have no doubt over the decades it will be the most prestigious global university, the way it is going.

It has been designed with a comprehensive vision; IIST provides an integrated educational experience spanning undergraduate, postgraduate, doctoral, and post-doctoral programs in a very distinguished category of knowledge and learning.

I am firmly committed to our belief that education is the most impactful transformational mechanism of change. It fosters equality, and antidotes inequities. Its mechanism of positive change enables our youth to embrace challenges and avail opportunities that are aplenty in our times.

Friends, this day marks the culmination of years of hard work, dedication, and perseverance. You must have tested the wrath of your teachers; they have been very strong on occasions, but every such wrath imparted will be nectar for you, and that realization you will have every moment of your life once you step outside.

As rightly indicated by the Chancellor, don't think this is the end of learning. Learning never

stops. As long as you live, you will have to continue learning. Once you stop learning, your downward slide will be expedited.

Even to maintain a static position, you will have to learn, and when you are in an upsurge mode, you have to learn even more. Learning is a part of our life; it never stops.

This institute is indeed privileged to be shaped by minds that are globally recognized. Each of the minds that contributed to the beginning and growth of this institute has made a mark on the growth of the nation.

What a distinction this institute has! Dr. A P J Abdul Kalam, former President of India, was the first Chancellor of IIST. This institution has been privileged to receive outstanding support from numerous distinguished personalities like the former President Dr. A P J Abdul Kalam and Prof. U R Rao.

The tone set then is on an incremental trajectory. It is the only institute of its kind in India that offers a BTech degree in Space Technology and subjects exclusive to the arena of space science and technology. This is amply reflected in our scientific upsurge.

Friends, India has traversed significantly in the last decade. And during this decade, there were global challenges and a pandemic. Bharat has been a shining star, and there has been global recognition, a favourite place for opportunity and destination on the global platform.

Recognition has come from bodies like the IMF, World Bank, and the like. This creates for you a soothing ecosystem where you can fully exploit your talent and realise your aspirations and dreams.

I appeal to you: look around at the vistas and opportunities you have. Break the silos because, undoubtedly, at the global level, India is a country of hope and possibility, and the world recognizes it.

My young friends, you are the largest stakeholders in governance. When we talk of Viksit Bharat, we talk of your involvement in 2047. Many of us may not be here, but you will be in the driver's seat, you will be in the pilot's seat, you will be controlling who shall be in those positions. Your role is very significant. Therefore, always keep in mind you have to bring about the change—a change good for the nation, a change you have dreamt of.

Therefore, always keep in mind you have to bring about a change which is good for the nation, a change of which you have dreamt.

I invite your attention to Heraclitus, he was a pre-Socrates era philosopher. It was he who said, "The only constant in life is the change" and he brought it about in his Court very rationally. What he said in Court "No man ever steps in the same river twice, for it is not it the same river lent and he is not the same man."

So, every moment things are changing but that change should not sweep you off your feet. You have to be in command of the change and the only way to be in the command of the change is to take the command of the technology, to be in innovative mode, to think out of the box.

This premier institution symbolizes India's growing prowess in space, and you are poised to be a vital part of this exciting journey. Your projects in combustion analysis, climate studies, AI applications, satellite imagery, and battery technology exemplify India's innovation prowess. I urge you to keep pushing boundaries and inspiring future generations to achieve new milestones in science and technology.

Let us aspire for times that will compete with ourselves and we don't compete with others. When I say India must compete with itself and not with others because we have to be the best on the planet and this is not asking for the moon, we enjoyed this status thousands of years ago, to the recognition of the entire world and India alone has the potential and knowledge and wisdom repository to bring about such a climaxing that will be soothing not only for the nation but for the entire world because this country believes in *Vasudev Kutumbakam*.

Offering a unique blend of academics and applied research, IIST has a curriculum designed in collaboration with ISRO. This partnership ensures cutting-edge knowledge of space research and development with practical skills for the 21st-century space industry and this industry has a very significant fiscal dimension. यह दोस्ती IIST और ISRO में क्या गुल खिलाएगी अब देखते रह जाएंगे. इसका असर भारत पर ही नहीं भारत के बाहर भी पड़ेगा और दुनिया इस दोस्ती का कमाल देख रही है.

India's journey in space exploration has been defined by its ambitious missions, groundbreaking discoveries, and steadfast commitment to scientific advancement.

In the field of space, our recent accomplishments have earned global accolades. In the year 2023, all seven launches of ISRO including Chandrayaan-3, and Aditya L-1, were successful. A total of 5 Indian satellites, 46 foreign satellites, and 8 rocket bodies (including POEM-2) were placed in their intended orbits. All this just in one year.

It is because of ISRO only, that *Bharat* can proudly boast of being the world's first country to successfully land *Chandrayaan* 3 on the south pole of Moon.

यह दोस्ती IIST और ISRO में क्या गुल खिलाएगी अब देखते रह जाएंगे. इसका असर भारत पर ही नहीं भारत के बाहर भी पड़ेगा और दुनिया इस दोस्ती का कमाल देख रही है. The moment will ever be etched in history and deeply embedded in our proud pleasant thoughts.

One of the noteworthy accomplishments is India's successful launch of the Mars Orbiter Mission (*Mangalyaan*), making it the first Asian nation to reach Martian orbit and the first in the world to do so in its maiden attempt. My heart fails when sometimes knowledgeable people for parties and purposes run down our growth which is being clapped and applauded by everyone on the planet. I feel to those people, play or politics, have your parties in specs, look through the prism in a partition manner but not when it comes to the interest of the Bharat when it comes to the growth history of this country when it comes to the reputation of this country.

India has made significant strides in the realm of Space Science and Technology, carving a niche for itself in the global arena.

I have the opportunity to visit ISRO facilities and interact with the chairman. Trust me I was inspired, motivated, and energized. What is being done by people is amazing. They are so passionate in mission mode. For whom? 1.4 million people. My salutations to them!

Be it India's first solar mission, *Aditya-L1* or the upcoming ambitious human spaceflight mission, *Gaganyaan,* each milestone has propelled India onto the global stage of space exploration.

Additionally, the *Chandrayaan* missions have significantly contributed to lunar exploration, unveiling new facets of the Moon's surface.

These achievements underscore India's technical prowess and determination to explore the uncharted territories of space.

Our space missions and achievements in the domain indeed "define our identity as a technology-creating nation striving to lead one of the most powerful and influential space programmes in the 21st century world." These are not my words. These are the ISRO Chairman's words. I concur with him one hundred per cent and identity as a nation in the world of science is defined by these accomplishments.

The success of missions led by the Indian Space Research Organisation (ISRO) has contributed significantly to India's diplomatic soft power and enhanced the quality of life of millions.

As you embark on your professional journeys, remember that the space industry is undergoing a thrilling metamorphosis. New paradigms like reusable launch vehicles are taking flight, vast networks of satellites are blanketing the globe, and human spaceflight is redefining the landscape.

These vistas like space are never-ending. You can exploit your talent to realise what is beyond contemplation of the people of my age. You can bring it to the ground reality.

The coming decades will witness an unprecedented surge in space exploration. India, with its robust space program and a growing pool of skilled professionals, is well-positioned to be a key player in this exciting journey.

Friends have it from me, this century belongs to Bharat. We have no doubt about it and our because *Bharat* is on the rise as never before and the rise is Unstoppable, the Rise is incremental and the rise will be driven by you once we step out and get into the marathon March that is going to climax in 2047. You will be an important stakeholder, the driving force of that March that will fructify in nothing but success. Personally, for me, I think Bharat will be *Viksit Bharat* ahead of 2047. I have no doubt about it.

I have been informed that the Lithium-ion battery technology developed by ISRO can be useful in the development of the electric vehicle ecosystem in the country. The Government of India has taken

the initiative with respect to certain minerals to put them in the private sector and why we are engaged with Lithium. Our next-generation situation is also coming with sodium. So, I have no doubt you will be abreast with Sodium at global level.

Dear friends, our position and geo-political strength will be determined not only by physical prowess but also by the intellectual and technological innovations emerging from our laboratories. A country investing in technological advancement ensures secure boundaries. Gone are the days of conventional warfare.

Friends, we have lived in an era where the mood was grim, the economic situation was painful, foreign exchange was dwindling, and gold had to be placed in physical form in Swiss banks. I am talking about a time when I was a member of parliament in 1989. I was a Union Minister. The size of the Indian economy was smaller than the cities of London and Paris. Our Foreign Exchange was between 1 billion and two billion dollars and now we are 660 billion dollars foreign exchange. We have Traversed a journey from Fragile 5 to the Big File Five global economy and are on the way to becoming the third-largest global economy. We must not hesitate this is on account of visionary leadership, a leadership that firmly gave policy to this country. When you have a political journey of that kind of nation that comprises 1.4 billion there are bound to be air pockets. and I have no doubt the Governance of this country during the next 5 years will put our country on a trajectory where we will have to look behind who is behind us and in this entire exercise you are a very important place.

Dear friends, today you have a corruption-free enabling ecosystem. Supportive policies are fostering the growth of a vibrant space ecosystem, and encouraging public-private partnerships that will propel India even further in the space race. Friends, nothing can happen unless you focus on research and development. There was a time when we used to wait for technology. Just imagine now there is hardly any technological gap between Bharat and the most developed Nations. Thanks to our scientific community. I urge from this platform to the corporate sector of the country to be extremely benign, Cognizant and extend Full support to research and development and they should realise that this research and development will ultimately benefit. They will gain the most because when it has to be put into circulation for larger public welfare, they are the only catalyst of the energy that can put it around. So, I appeal to you to do that.

Disruptive technologies- artificial intelligence, internet of Things (IoT), machine learning, blockchain, and the like are both opportunities and challenges. These are the things you must be fully aware of.

Quantum computing machine. We are among the few countries in the world where allocation has been made for 6000 crores. You need more than anyone else. Quantum computing. Our Green Hydrogen mission with a commitment of 80000 crore and it has the potential to generate 6 lakh jobs and investment of 8 lakh crores. we have enough. One problem which I see is that our young Minds when it comes to opportunities are working in silos. They think their opportunity lies only in the respect of certain competitive examination results but not any longer. They then need to be informed that the best is outside the silos. You need to be fully Cognizant aware of the best avail. These opportunities are challenging but the gains will be geometric and I am sure you will take note of it. We are on a mission to regain its past glory that will be done only by people like you.

I remember my student days. Scholarship gave me the opportunity to be in the Sainik School. Let me tell you I love to come to those states, Kerala is one of them where my teacher lives, my favourite teacher. She mentered me, she had held me is from Kerala, Miss Ratnavali Nayyar. Every time I come to this place I take it as no less than a pilgrimage to pay tribute. I have visited her house. We are in touch with her. I requested a very distinguished member of parliament PT Usha Ji to see that my teacher visits where I live in Delhi, the new Parliament building so that we can feel blessed there my message to you all doctor Kalam is being all over why? People see him as a teacher doctor S Radhakrishnan is not remembered as a philosopher, as vice president as president of India is remembered on 5 September as a teacher in the form of teacher's day. Always have your teacher in mind, your parents in mind, they make you, they have made you, and never disappoint.

Dr. Kalam's words resonate deeply with the ethos of IIST: "Dream, dream, dream. Dreams

transform into thoughts and thoughts result in action." This is with Swami Vivekanand's clarion call 'awake, rise till goal" If two are coupled this space flight will land at any destination in this space which will be a glorious moment.

This is an institution where dreams take wings as thoughts lead to groundbreaking actions. So, think out of the box. Never have tension, never have stress, never fear failure; Failure is just a further step to success. If you need any proof *Chandrayaan 2* was not a failure, it was a stepping stone to the success of Chandrayan 3. The day *Chandrayaan 2* was to land on the moon, I was the governor of the state of West Bengal. It was midnight. me and my wife both have gone to Science City. We were in the company of 500 young boys and girls. We all were watching *Chandrayaan 2* and came quite close but the landing was not soft and there was pin-drop silence. came a message from the Prime Minister we have largely succeeded and success fructified with *Chandrayaan* 3. Therefore, never fear failure. For fear of failure if you put your entire mind to be a parking place for a great idea you are doing justice not only to yourself but to humanity. So never stop trying.

Friends before concluding I must share one concern which I faced this morning. I hope this has not taken place. when informed Minds knowingly lead astray, we need to be on guard. We have informed Minds on the dias and we have informed Minds in the faculty. if you say something different that you don't believe in everyone will believe you because you are having an elevated position. So, this morning when I read a paper an informed mind who has been the finance minister of this country, parliamentarian for long and a member of Rajya Sabha currently. He stuns me because I take great Pride that this Parliament has done a great thing. It has unshackled us from colonial legacy by giving three laws that are of epochal dimension.

From *Dand Vidhan* we have come to *Nyay Vidhan*. Every member of parliamentary has the opportunity to contribute on the floor of the house. This gentleman of the Parliament with a great background as finance minister and what he says, "New laws but drafted by part-timers" are we part-timers in parliament. inexcusable absurd to the wisdom of parliament. With a heavy heart, I am sharing with you the gentleman did not use his lung power he gave proper rest to his vocal chords while the debate was going on. Not only he and his distinguished colleagues from my legal fraternity did not come forward to help the nation they also had an opportunity to make his point in Parliament.

It was a failure on his part to perform his Constitutional duty and obligation and how can we countenance such a man speaking in high decibels, time to seek resonance on the people only to set mechanisms. I am shocked beyond words and therefore please be aware of the minds who deliberately as a strategy by way of a narrative try to run down our nation, demean our institutions, and our progress, don't see the writing on the wall, they engage in criticism for the sake of the criticism. I do not have words strong enough to convey such a narrative being set afloat. A member of parliament is being labeled as a part-timer. Ultimately it is a parliament that is the last source of law formulation. Every section of the society is represented there. The entire country finds a place when it comes to expression. Failure of duty on your part and act of omission, Commission, or dereliction of Duty that can never be explained you must hold yourself accountable. I am addressing the author of this that was made by the part-timers to your conscience. I appeal to him from this platform these derogatory, defamatory, highly insulting observations to Members of Parliament. I hope he does it.

I am confident that each of you will play a pivotal role in shaping 'Viksit Bharat@2047'. Together, with absolute confidence and determination, we stride towards this shared vision. I extend my heartfelt wishes to all of you for a successful and fulfilling career ahead.

Thank you.

Jai Hind!

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CAMPUS NEWS

National Seminar on Buddhist Educational Philosophy

A two-day National Seminar on 'Buddhist Educational Philosophy: Complex Challenges of the Modern World and Balanced Approach' was organised by the Department of B.Ed., CRDAM PG College, Gorakhpur in collaboration with Government Buddha Museum, Gorakhpur. The event was sponsored by Sanskriti Vibhag, Uttar Pradesh, recently. About 120 delegates, including 40 participants from outstations, encompassing students, researchers, faculty members, and professionals participated in the Event.

The Chief Guest, Professor Harikesh Singh, former Vice Chancellor, Jai Prakash University, Chhapra, Bihar inaugurated the event. The Welcome Address was delivered by the Vice Chancellor, Prof. Poonam Tandon who emphasized the relevance of Lord Buddha's teachings in today's context. Prof. Tandon highlighted the importance of imparting knowledge about the Buddhist tradition to children, underscoring that Buddhism transcends national boundaries. She reiterated Lord Buddha's emphasis on renouncing desire and attaining a state of freedom from suffering, emphasizing the purity that religion provides to life.

During the inauguration, Professor Harikesh Singh delivered the speech, providing valuable insights into Lord Buddha's perspective on knowledge and wisdom. He delved into the teachings of *Heenyan, Mahayan,* and *Bajrayaan*, identifying contemporary challenges such as megalomania, presentism, and isolation. Prof. Singh emphasized *'Atma Deepo Bhav'* (Be your own light) and the purification of the mind as the ultimate prosperity.

The event explored the moral disciplines (*Yama*) and observances (*Niyama*) as outlined by Lord Buddha. The Chief Guest and Keynote Speaker, Prof. Dwarka Nath, former Head, Department of Philosophy, DDUGU, Gorakhpur emphasized the global significance of Mahatma Buddha. He underscored Buddhas' departure from metaphysical focus, focusing on ethics, logic, and psychology. Prof. Nath characterized Buddha's philosophy as practical and morally grounded, citing the 'Eightfold Path' and 'Twelve Nidanas' as crucial for alleviating suffering.

Dr. Dharamvrat Tiwari, former Assistant Professor, Adult Education, DDUGU highlighted the contemporary issue of violence and stressed the importance of prioritizing the welfare of all living beings. Shri Pushp Dant Jain, Chairman of the College Management Committee and Minister of State urged the implementation of Buddha's teachings in everyday life. The Inaugural Function also featured the release of the book 'Different Dimensions of Yoga' authored by Dr. Ramchandra Tiwari. Dr. Yashwant Singh Rathore, Deputy Director, Government Bauddha Museum, Gorakhpur proposed the Vote of Thanks.

The Technical Session chaired by Prof. Rajesh Singh, Education Faculty, DDUGU, Gorakhpur commenced with diverse paper presentations. Chief Speaker Professor Vipula Dubey, former Head, Department of Ancient History, DDUGU emphasized the peaceful solutions offered by Buddha's philosophy to contemporary problems. The next session chaired by Prof. Sarita Pandey explored the caste system and the need for societal reform based on Buddha's teachings.

Dr. Ashutosh Kumar, Head of Economics Department, Rajkiya Mahavidyalaya, Tihari, Gadhwal explained both theistic and atheistic philosophies. The session featured presentations on the relevance of Buddhist principles in modern education, the perspective of Buddhist philosophy in the context of NEP-2020, and understanding environmental ethics through Buddhist education. The next session commenced with a speech by Prof. Naresh Prasad Bhokta, former Head and Dean, Faculty of Education, DDUGU emphasizing the importance of adopting the middle path and the compassion inherent in Buddhist philosophy.

Additionally, Prof. Sushma Pandey Keynote Speaker, Faculty of Education, DDUGU, Gorakhpur made everyone aware of the essence of Mahatma Buddha's philosophy. She said that it is possible to attain '*Mahaparinirvana*' through good deeds and good thoughts. The other session was led by Prof. Brijesh Kumar Pandey, Principal, Ramji Sahay PG College, Deoria. He urged everyone to incorporate Mahatma Buddha's teachings into their behavior. He elucidated that this philosophy, grounded in

Buddha's guidance, underscores the significance of interrelationship, ethical conduct, and inner harmony as crucial pillars for overcoming present-day challenges. Additionally, Chief Speaker, Prof. Ramesh Prasad Pathak, Lal Bahadur Shastri Rashtriya Sanskrit University explained the root causes of suffering and its prevention contained in the teachings of Mahatma Buddha. He said that a person should not acquire more things than necessary. Buddha's message is that '*Aatm Deepo Bhav*' or ''Be Your Own Light'

The Chief Speaker, Dr. Vibhratv Chandra Kaushik, Minister of State with Status highlighted the need for improved guru-disciple relationships. The Chief Guest, Prof. Sanjeet Kumar Gupta, Vice Chancellor, Jannayak Chandrasekhar University emphasized attaining Nirvana through meditation, knowledge, and discipline. Prof. Archana Mishra, Ratan Sen Degree College, Bansi, Siddhart Nagar Explaining the importance of education, she said that improvement of the society is possible with the coordination of intellectual and spiritual education. Prof. Umesh Yadav, Head, Department of B.Ed., President, Jawahar Lal Nehru PG College, Maharajganj. Special Guest threw light on the life of Gautam Buddha, he said that one can get rid of the world only after attaining *Buddhatva*. Dr. Purnesh Narayan Singh Head of Department, B.Ed. HRPG College, Khalilabad, Sant Kabir Nagar said that India has given us Buddha, not war. Gautam Buddha talked about non-violence in his philosophy. Non-violence does not mean cowardice but it means nurturing human religion. The Vote of Thanks was proposed by Dr. Aparna Mishra, Head, Department of B.Ed., CRDAM PG College, Gorakhpur underscoring the importance of Buddha's teachings in fostering a society based on intellectual and spiritual education.

International Conference on Law and Social Transformation

The one-day International Conference on 'Law and Social Transformation' is being organized by the Alliance University, Bengaluru, Karnataka on September 28, 2024 through hybrid mode. The faculty members, judicial officers, advocates, research scholars, and students may participate in the Event.

The theme encompasses the intersection of law, social transformation, and sustainable development. It underscores the pivotal role of legal frameworks and innovation in driving societal change towards sustainable futures. Topics could include the evolution of legal systems to address environmental challenges, the role of human rights in sustainable development, the promotion of green economies through legal mechanisms, and the empowerment of marginalized communities through legal advocacy of sustainability. The event will explore how legal innovation can effectively navigate the complex landscape of social transformation, fostering collaboration among legal experts, policymakers, activists, and scholars to pave the way for a more equitable, resilient, and sustainable world. The Areas of the event are:

- Technology and Innovation.
- Education, Innovation, and Research.
- Sustainability and Judiciary.
- Climate Change, Environment, and Sustainability.
- Transformative Constitutionalism.
- Gender Justice and Human Rights.
- Emerging Paradigms of IPR.
- Labour Rights and Challenges.
- Taxation and Equitable Wealth Distribution.
- Social Media Activism.
- Conflict Resolution and Sustainability.
- Entrepreneurship and Innovation.
- Cross-border Collaboration on Legal Innovation for Global Sustainability.
- Vulnerable Populations, Including Migrants and Refugees.
- The Legal Dimensions of Pandemics, Humanitarian Crises, and Global Emergencies.
- Evolving Security Threats and Geopolitical Dynamics.

For further details, contact Coordinators: Dr. Rashmi K S / Dr. Upankar Chutia, Associate Professor, Alliance School of Law, Alliance University, Central Campus, Chikkahagade Cross, Anekal, Bengaluru – 562 106, Karnataka, Mobile No: 094483 55047/ 097171 32331, E-mail: *icls@alliance.edu.in.* For updates, log on to: *www.alliance.edu.in/events/*

International Conference on New Product Development and Smart Manufacturing

A two-day International Conference on 'New Product Development and Smart Manufacturing' is

being organized by the Department of Mechanical Engineering & Centre of Excellence in Product Design and Smart Manufacturing, Maulana Azad National Institute of Technology, Bhopal, Madhya Pradesh from December 19-20, 2024 through hybrid mode.

Mechanical Engineering will evolve and collaborate as a global profession over the next decade through its emerging trends to develop engineering solutions that foster a cleaner, safer, and sustainable world. Product Design and Smart Manufacturing involve interdisciplinary research and enable the development of new products by making the use of innovative technologies. Also, it allows us to customize the products at any time based on customer requirements. The event aims to serve as a platform for researchers, academicians, and industrialists to interact and exchange their ideas and research results to accelerate progress in the development of new products with the help of smart manufacturing techniques.

- Advanced Machining Processes.
- New Product Development.
- Smart Manufacturing.
- Additive Manufacturing.
- AI Enabled Smart Manufacturing.

For further details, contact Organising Secretary, Department of Mechanical Engineering & Centre of Excellence in Product Design and Smart Manufacturing Maulana Azad National Institute of Technology, Bhopal -462003 (Madhya Pradesh). For updates, log on to: *https://conf.manit.ac.in/NPDSM2024/*

AIU News

Faculty Development Programme on Exploring Academic Research

The eight-day Faculty Development Programme on 'Exploring Academic Research: Overcoming Challenges and Embracing Opportunities' was organized by the Association of Indian Universities (AIU), New Delhi─Academic and Administrative Development Centre (AADC), Chitkara University, Himachal Pradesh in collaboration with the Internal Quality Assurance Cell (IQAC) from May 28-June 4, 2024. The event aimed to provide faculty members with the opportunity to learn new skills and explore opportunities in the field of research. Dr. (Mrs.) Pankaj Mittal, Secretary General, AIU and Dr. Amarendra Pani, Joint Director and Director (I/c), Research Division, AIU graced the event. Other dignitaries, Dr. Ashok K. Chitkara, Chancellor, Chitkara University, Dr. Madhu Chitkara, Pro-Chancellor, Chitkara University, Dr. Rajnish Sharma, Vice Chancellor, Chitkara University and Dr. Meenu Khurana, Pro-Vice Chancellor, Chitkara University were also present during the event.

Dr. Amarendra Pani inaugurated the event with a special address, stressing the importance of sustainable research and development. Prof. M Maheshwary, Principal, Chitkara University College of Nursing, extended a warm welcome to all the participants present during the event. In his Inaugural Address, Vice Chancellor, Dr. Rajnish Sharma, discussed the challenges facing the current scenario, the importance of citations, and the quality of research publications and the quality of research publications. Prof. Navdeep, Vice Principal, College of Nursing proposed a vote of thanks and concluded the session.

Dr. Nikhil Kumar Marriwala, Assistant Professor, Kurukshetra University, Haryana led the session on 'Cultivating Research Visibility: Strategies to Enhance Your Academic Impact'. The session on 'Research Methodology: A Roadmap to Effective Research' was led by Dr. Ashok Kumar, Nursing Tutor, National Institute of Nursing Education (NINE), Postgraduate Institute of Medical Education and Research, Chandigarh.

Dr. Seeta Devi, Associate Professor, Symbiosis College of Nursing , SIU, Pune delivered the session on 'Emerging Technologies and Innovation'. During the next session, Dr. Nitasha, Lecturer, National Institute of Nursing Education (NINE), Postgraduate Institute of Medical Education and Research, Chandigarh discussed the topic 'Intellectual Property Rights in Research'.

Dr. Jagriti Saini, Founder and Owner, Eternal Restem delivered on 'Case Study: Thyroid Data

Analysis and Forecasting Using Python' and Dr. Abhishek Thakur, Assistant Professor and Nodal Officer, DCSE, Chitkara University, Himachal Pradesh on 'Case Study on Data Analysis and Forecasting of the COVID-19 Dataset Using Python', respectively. In different case studies, both speakers made the participants aware of the dataset using Python.

The session on 'Understanding the Value of Data and Data Visualization: A Journey through Data, Information, and Knowledge' was delivered by Dr. Rajeev Kumar Panda, Associate Dean, School of Mass Communication, KIIT University, Bhubaneshwar. During the session, Dr. Pooja Soni, Assistant Professor, Operation Research, Statistics, Panjab University addressed the participants and discussed the topic 'Qualitative and Quantitative Analysis'.

The next session was delivered by Dr. Sharadha Ramesh, Professor and Principal, Vinayaka Mission's College, Nursing, Puducherry on the theme 'Ensuring Research Integrity and Ethical Practices'. Dr. Meenu Khurana, Pro-Vice Chancellor, (School of Engineering and Technology), Chitkara University, Himachal Pradesh spoke on 'Research for Sustainable Development'.

Ms. Rajni Nair, Nurse Consultant and Acting Nursing Director, Metro North Health Brisbane, Queensland, Australia spoke on 'Enhancing Research Practices through Interdisciplinary Collaboration'. The session on 'Interdisciplinary Collaborative Research for Professional Academic Development in Higher Education' was addressed by Dr. Latha Venkatesan, Professor and Principal, All India Institute of Medical Sciences, New Delhi. The event concluded with the Valedictory Session where the Coordinator, Dr. Pradeepta Sarangi addressed the participants and thanked all of them including AIU authorities for their support.

Faculty Development Programme on Effective Teaching

The five-day Faculty Development Programme on 'Effective Teaching through Content Development and Online Pedagogy' was organized by the Association of Indian Universities (AIU), New Delhi ─ Academic and Administrative Development Centre (AADC), Integral University, Lucknow, Uttar Pradesh from May 30 - June 03, 2024. There were about 92 participants in the Faculty Development Programme from various states of the country and also four participants from abroad reflecting the diversity among learners. Participants were from various disciplines like Engineering, Management, Computer Science, Education, etc. with their diverse learning backgrounds. The event aimed to make the faculty members well-informed with content development and online pedagogy which are most relevant in the present time, thus reforming the effective teaching practices in all the disciplines and shaping the participants into becoming the pillars of a much more desirable and candescent tomorrow.

During Inaugural Session, after the welcome address, Mr. Zishan Raza Khan, Dy. Director, HRDC Integral University and Nodal Officer of the event briefed the participants about the roles and responsibilities of AADC and discussed the functioning of the centre. Dr. Usha Rai Negi, Consultant, Research Division, AIU blessed the participants and discussed the activities carried out by the Association of Indian Universities for the upliftment of faculty members of Higher Education. Dr. Kiran Lata Dangwal, Associate Professor, Department of Education, University of Lucknow was the Guest of Honour at the Inaugural Session.

In the next session, Dr. Kiran Lata Dangwal delivered a Keynote Address on the topic 'Emerging Trends in Educational Technology' where she gave a detailed description of the use of technology in various domains. The session after the break was on 'Professional Development Opportunities for Teachers and their Strategies for Continuous Improvement' which was discussed by Dr. Moinuddin Khan, Principal, DIET-Jehanabad, Bihar in which the expert highlighted different dimensions for professional development, later on the session on 'Pedagogy and E-Learning' was delivered by Dr. Divya R Panjwani, Assistant Professor, Department of Education, Integral University, Lucknow. She gave insights to the participants about various teaching skills, a teacher can use through offline or online mode. In the next session, the participants submitted an assignment on how a teacher can develop professionally.

Further, the lectures were on the main theme of 'Education 5.0 and Video Making Tools. During the session, Dr. Rubeena, Faculty of Education, Maulana Azad National Urdu University, Hyderabad discussed the 'Education 5.0 and its Various Approaches'. In the next session, participants explored the ways through which they could take their institution to Education

5.0. They suggested the same through assignment submission.

There was a session pertaining to 'Video Making Tools for Educational Purposes' by Dr. Ela Goyal, Founder of ME Educational Technologies and Consultancy Services, LLP where the resource person explained different ways through which videos can be prepared. The expert also discussed adding machine voice to the presentations. Participants did hands-on and made PowerPoint presentations which contained machine voice. Furthermore, in the last session, queries pertaining to the usage of different tools for educational purposes were addressed.

The session on the theme 'Robotics and Digital Marketing in Education' was conducted by Dr Sumita Chaturvedi, Associate Professor, Department of Mechanical Engineering, Integral University. She discussed the topic of 'Robotics in Education'. The Resource Person made the session interactive and gave real examples of the 'Use of Robotics in the Education Sector'.

She presented a futuristic view of how Robots can enhance the Educational System in the future. The next session was taken up by Nidhi Madhekar, Professor, IMR, Pune on the topic of 'Tools Digital Marketing in Education'. The resource person discussed various Digital Marketing Platforms used by Educational Institutions.

The session on 'Virtual Reality in Education' was taken up by Dr. Neetu Singh, Department of Pedagogical Sciences, Faculty of Education, Dayalbagh Educational Institute, Agra along with its hands-on Practice. In the session, important aspects of the use of Virtual Reality in Education were highlighted.

Dr Moiz Akhtar, Assistant Director-IQAC, Integral University, Lucknow delivered the lecture on 'Importance of Ranking for Professional Development' where he pointed out the process of accreditation, challenges in accreditation, and outcome-based education. He resolved many queries of the participants about accreditation. The next session was conducted by Dr. Kirti Prajapati, Department of Education, Mahatma Jyotiba Phule Rohilkhand University, Bareilly, Uttar Pradesh where she discussed various teaching competencies for online teaching.

Ms. Shalini Agrawal, Assistant Professor, Balram Krishan Academy, Mohanlalganj, Lucknow delivered the lecture on 'Flipped Classrooms and Blended Learning'. She discussed different ways through which a teacher can successfully conduct the classes through the use of this pedagogy. In other sessions, participants were given the task of preparing a video of educational content of their choice for e-content development. They presented their video file during this session. The participants submitted their assignments through Google Forms.

During the Faculty Development Programme, the participants actively engaged with the Resource Persons by fostering meaningful dialogues. The event was managed and coordinated by Mr. Zishan Raza Khan, Nodal Officer, Dr Divya R Panjwani and Dr Nazia Akhlaq, Coordinator under the able guidance of Prof. (Dr.) Syed Aqeel Ahmed, Director, HRDC, Integral University. ❑

THESES OF THE MONTH

SCIENCE & TECHNOLOGY

A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of May-June, 2024)

BIOLOGICAL SCIENCES

Biochemistry

1. Nabi, Nusrat. **Characterization of serine/threonine mitotic kinases providing resistance to apoptosis and their relevance to cancer**. (Dr. Shaida Andrabi), Department of Biochemistry, University of Kashmir, Srinagar.

Biotechnology

1. Biswas, Viplov Kumar. **Role of NCoR1 in host defense mechanisms against mycobacterium sp. in myeloid cells**. (Dr. Bhawna Gupta and Dr. Sunil Kumar Raghav), Department of Biotechnology, Kalinga Institute of Industrial Technology, Bhubaneswar.

2. Mir, Ulfat Syed. **Unravelling the role of inner nuclear membrane protein complex (Lem2-Nur 1/Heh1-Nur1) in genome organisation**. (Dr. Mohd Altaf Bhat and Dr. Ajaz Ul Hamid Wani), Department of Biotechnology, University of Kashmir, Srinagar.

Food Science & Technology

1. Rashid, Rubiya. **Application of nanoencapsulation technology to enhance bioavailability and stability of bioactive compounds extracted from fruit and vegetable waste**. (Prof. F A Masoodi and Dr. Sajad Mohd Wani), Department of Food Science and Technology, University of Kashmir, Srinagar.

Life Science

1. Lone, Waseem Ahmad. **Understanding the regulation of flowering in Brassica rapa L by transcriptomic and metabolomic approach**. (Dr. Riffat John), Department of Botany, University of Kashmir, Srinagar.

2. Salunkhe, Vaishnavi Haribhau. **Seasonal dynamics and bioprospecting of rhizospheric microbiota from Western Ghats**. (Dr. Narendra Kadoo), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

3. Zaidi, Zainab. **Deciphering the role of mtDNA loss in proteostasis in *Saccharomyces cerevisiae***. (Dr. Kausik Chakraborty), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Microbiology

1. Bind, Deepak Sameer. **Comparative study of different diagnostic modalities for the detection of Malaria and anti malarial drug (Chloroquine) resistance genes and its polymorphism with insilico protein expression and its homology in plasmodium Vivax and plasmodium falciparum at a Tertiary Care Centre Kanpur**. (Dr. R Sujatha), Department of Microbiology, Rama University, Kanpur.

2. Pandey, Shubhangi. **Energy feedstock production in Chlamydomonas reinhardtii as a function of abiotic stress**. (Prof.G Archana), Faculty of Science, M S University of Baroda, Vadodara.

3. Yadav, Suneet Kumar. **Phenotypic and genotypic study of colistin resistance amongst Klebsiella Pneumoniae from Critical Care Unit (CCU) patients in tertiary care centre at Kanpur**. (Dr. R Sujatha), Department of Microbiology, Rama University, Kanpur.

EARTH SYSTEM SCIENCES

Environmental Science

1. Rashid, Sumaira. **Evaluation of genetic diversity and anti-hyperlipidimic potential of Eremurus Himalaicus**. (Dr. Adil Gani), Department of Environmental Science, University of Kashmir, Srinagar.

ENGINEERING SCIENCES

Architecture & Design

1. Esther, Sunalini. **The synthesis of architectural theory and deep learning pedagogy for comprehensive architectural education**. School of Planning, Architecture and Design Excellence, Hindustan Institute of Technology & Science, Chennai.

Computer Science & Engineering

1. Dilli Babu, M. **Medical Data Lake for identification of heart disease using clustering techniques**. Department of Computer Science & Engineering, Hindustan Institute of Technology & Science, Chennai.

2. Kirupanithi, Nancy. **Detection of insider attack in blockchain network using the trusted intrusion detection system**. (Dr. Nancy Kirupanithi D), Department of Computer Science & Engineering, Hindustan Institute of Technology & Science, Chennai.

3. Sharma, Moolchand. **Bio-inspired optimization technique for drug discovery**. (Dr. Suman Deswal), Department of Computer Science & Engineering, Deenbandhu Chhotu Ram University of Science and Technology, Murthal.

4. Verma, Ankit. **Efficient routing technique for IOT networks**. (Dr. Suman Deswal), Department of Computer Science & Engineering, Deenbandhu Chhotu Ram University of Science and Technology, Murthal.

Electrical & Electronics Engineering

1. Ali, Shaik Muqthiar. **Cost allocation in a deregulated power system with reliability index**. (Dr. M Padma Lalitha and Dr. N Visali), Department of Electrical & Engineering, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

2. Prasad, Chella Hari. **Cost analysis by optimal distributed generation placement in distribution systems**. (Dr. K. Subbaramaiah and Dr. P Sujatha), Department of Electrical Engineering, Jawaharlal Nehru Technological University, Hyderabad.

Electronics & Communication Engineering

1. Abraham, M. **Design, analysis and optimization of frequency reconfigurable antenna for UWB and 5G Applications**. Department of Electronics & Communication Engineering, Hindustan Institute of Technology & Science, Chennai.

2. Sehrawat, Preeti. **Investigations of efficient routing schemes for software defined vehicular networks using machine learning**. (Dr. Mridul Chawla), Department of Electronics & Communication Engineering, Deenbandhu Chhotu Ram University of Science and Technology, Murthal.

3. Stud, A Charles. **Super resolution of MRI images using compressive sensing and fuzzy logic**. (Dr. N Ramamurthy), Department of Electronics & Communication Engineering, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

4. Tyagi, Manisha. **Classification of human brain MRI images for tumor detection using Artificial Intelligence**. (Dr. Priyanka), Department of Electronics & Communication Engineering, Deenbandhu Chhotu Ram University of Science and Technology, Murthal.

5. Venkataramana, P. **Design and development of low cost and compact multi function radar**. (Dr. G Mamatha), Department of Electronics & Communication Engineering, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

6. Yadav, Rahul. **Detection and classification of human facial micro-expressions**. (Dr. Priyanka), Department of Electronics & Communication Engineering, Deenbandhu Chhotu Ram University of Science and Technology, Murthal.

Material Science and Engineering

1. Bansal, Gaurav Kumar. **Phase transformations and mechanical behavior of quench and partitioned steel**. (Dr. Sandip Ghosh Chowdhury), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Mechanical Engineering

1. Naik, Mude Murali Mohan. **Performance augmentation of combined cycle power plant with inlet air cooling vapour absorption refrigeration system**. (Dr. V S S Murthy Dr. B. Durga Prasad), Department of Mechanical Engineering, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

2. Rathee, Rahul. **Dynamics of manipulation of a rigid object with soft contact**. (Dr. Anil Kumar Narwal and Dr. Anand Vaz), Department of Mechanical Engineering, Deenbandhu Chhotu Ram University of Science and Technology, Murthal.

3. Reddy, M.Penchala. **Influence of swirl number and moisture content on the performance of coal combustion in power plant/industrial applications**. (Dr. K. Hemachandra Reddy), Department of Mechanical Engineering, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

MATHEMATICAL SCIENCES

Mathematics

1. Malik, Mudasir Ahmad. **Existence and iterative approximation of solution of variational inclusion problems**. (Dr. Mohd Iqbal Bhat), Department of Mathematics, University of Kashmir, Srinagar.

2. Mital, Hiren Mistry. **Mathematical modelling of electrically conducting fluid flow problems in presence of magnetic field**. (Prof.Haribhai R Kataria), Faculty of Science, M S University of Baroda, Vadodara.

MEDICAL SCIENCES

Pharmaceutical Science

1. Banday, Nazia. **Pharmacognostic standardization, chemoprofiling and evaluation of anti-cancer potential of aerial parts of senecio laetus**. (Prof. Zulfiqar Ali Bhat), Department of Pharmaceutical Sciences, University of Kashmir, Srinagar.

2. Sheeba. **Evaluating the role of some monoterpens against streptozotocin and high fat diet induced diabetic nephropathy in rodents**. (Prof. Nahida Tabassum), Department of Pharmaceutical Science, University of Kashmir, Srinagar.

3. Sudheer Kumar, H M. **Development and validation of novel RP-HPLC methods for estimation of single and combinational drugs in bulk and its dosage forms**. (Dr. H M Sudheer Kumar), Department of Pharmaceutical Sciences, Jawaharlal Nehru Technological University, Hyderabad.

PHYSICAL SCIENCES

Chemistry

1. Ali, Kasim. **Tri and tetra-substituted methanes and ethanes as medicinally important molecules**. (Dr. Gautam Panda), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.
2. Bijanu, Abhijit. **Development of flexible and mouldable radiation shielding material based on polymer composites**. (Dr. Deepti Mishra), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.
3. Choudhary, Nikki. **Chemical characterization and source apportionment of aerosols using receptor models at different sites of the Himalayan Region of India**. (Dr. Sudhir Kumar Sharma), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.
4. Komal. **Study on the development of calibration gas mixtures of COx, hydrocarbons and their application in vehicular pollution monitoring**. (Dr. Daya Soni), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.
5. Mathur, Priyanka. **Development of curcuminoids based novel supramolecular architectures for anticancer drug delivery systems**. (Dr. Arpita Desai), Department of Chemistry, M S University of Baroda, Vadodara.
6. Patel, Manojkumar Jivanji. **Synthesis, characterization and dyeing performance of reactive dyes**. (Prof. Ramnik Chhaganlal Tandel), Department of Chemistry, M S University of Baroda, Vadodara.
7. Pola, Jeevan Kumar. **Adsorption, Kinetic, thermodynamic and degradation studies of organic dyes over activated Neem flower**. Department of Chemistry, Hindustan Institute of Technology & Science, Chennai.
8. Komalla, Sunil. **Synthesis of 2,5-dihydrofurans, furan substituted 2,3-dihydroquinazolinones and benzooxepino-fused pyrroles through inter-and intramolecular annulations of alkynes**. (Dr. G V Karunaka), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.
9. Rawat, Priyanka. **Identification, structural characterization and quantification of naturally occurring bioflavonoids utilizing liquid chromatography-tandem mass spectrometry**. (Dr. Sanjeev Kanojiya), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.
10. Thejus, PK. **Design and development of multifunctional inorganic pigments for cool coating applications**. (Dr. Dr. Nishant K G), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.
11. Wakchaure, Padmaja Dadasaheb. ***In silico* study to unravel the interaction of organic and biomolecules with metal ions/ligands for their material and biological applications**. (Dr. Bishwajit Ganguly), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.
12. Vora, Aliakbar Maqbool. **Catalysts for hydrogen generation from renewables**. (Dr. Arun Gurudath Basrur and Dr. Ran Bahadur), Department of Applied Chemistry, M S University of Baroda, Vadodara.

Physics

1. Brajesh, Rajesh Bhagat. **Band gap engineering of functionalized semiconductors for photocatalytic applications**. (Dr. Alpa Dashora), Department of Physics, M S University of Baroda, Vadodara.
2. Degda, Nareshkumar Jethabhai. **Luminescence studies of rare earth doped perovskite phosphors**. (Prof. M Srinivas), Department of Physics, M S University of Baroda, Vadodara.
3. Jana, Sourav Kanti. **Investigation of binding affinity of biomolecules over novel carbon nanomaterials**. (Prof.Prafulla Kumar Jha), Faculty of Science, M S University of Baroda, Vadodara.
4. Saxena, Ankush. **Insertion of atomic layers in bulk topological insulators**. (Dr. V P S Awana), Faculty of Physical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

❑

Dr. Homi Bhabha State University
Mumbai

Mahatma Gandhi Road, Fort, Mumbai – 400032

Advertisement No. HBSU/Statutory Post/01/2024

Applications are invited from the eligible candidates in the prescribed format for the following posts on the establishment of the Dr. Homi Bhabha State University, Mumbai.

Sr. No.	Name of the Post	No. of Post
1	Registrar	01
2	Director, Board of Examinations & Evaluation	01
3	Director, Innovation, Incubation & Linkages	01
4	Finance & Accounts Officer	01

Application in prescribed format, prescribed fees, required educational qualifications, experience and other conditions etc. for the above posts is available on the University website **www.hbsu.ac.in** under the '**Career'** link. The last date to receiving applications is 29/07/2024 (upto 5.00 pm).

Mumbai - 400 032. Sign/-
Date:08/07/2024 I/c REGISTRAR

Royal Higher Education Society's
ROYAL COLLEGE OF ARTS, SCIENCE & COMMERCE
Penkar Pada, Mira Road (E), Dist: - Thane – 401 107.
A MINORITY AUTONOMOUS INSTITUTION

APPLICATIONS ARE INVITED FOR THE FOLLOWING CLOCK HOUR BASIS POSTS
FOR THE ACADEMIC YEAR 2024-2025.
AIDED

Sr.No	Cadre	Subject	Total No. of CHB Posts	Category
1	Assistant Professor	Economics	02	02 – OPEN
2	Assistant Professor	Political Science	01	01 – OPEN
3	Assistant Professor	Physics	02	02 – OPEN
4	Assistant Professor	Botany	02	02 – OPEN
5	Assistant Professor	Chemistry	01	01 – OPEN
6	Assistant Professor	Zoology	03	03 – OPEN

The above posts are open to all, however candidates from any category can apply for the post.

Reservation for women will be as per **University Circular No. BCC/16/74/1998 dated 10th March, 1998. 4% reservation shall be for the persons with disability as per University Circular No. Special Cell/ICC/2019-20/05 dated 5th July, 2019**.

Candidates having knowledge of Marathi will be preferred.

"Qualification, Pay Scales and other requirement are as prescribed by the UGC Notification dated 18th July, 2018, Government of Maharashtra Resolution No.Misc-2018/C.R.56/18/UNI-1, dated 8th March, 2019 and University Circular No. TAAS/(CT)/ICD/ 2018-19/1241, dated 26th March, 2019 and revised from time to time." Remuneration of the above post will be as per University Circular No.TAAS(CT)/01/2019-2020, dated 02nd April, 2019 & University Circular No. CTAU/23/2021-2022, dated 25th January, 2022.

The Government Resolution & Circular are available on the website mu.ac.in

Application with full details should reach the **PRINCIPAL, Royal Higher Education Society's, ROYAL COLLEGE OF ARTS, SCIENCE & COMMERCE, Penkar Pada, Mira Road (E), Dist. Thane-401107.** Within 15 days from the date of publication of this advertisement. **This is University approved advertisement**

PRINCIPAL

Deep Education Society's

SAS Institute of Management Studies

Opp. G.R. Engineering Company, MIDC, Boisar (W), Pin – 401 501.

APPLICATIONS ARE INVITED FOR THE FOLLOWING POSTS FROM THE ACADEMIC YEAR 2024-25:

Sr. No.	Cadre	Total No. of Post	Posts Reserved for							
			OPEN	SC	ST	DT	NT	OBC	SBC	EWS
1.	Director	01	01	--	--	--	--	--	--	--
2.	Professor	01	01	--	--	--	--	--	--	--
3.	Associate Professor	04	01	01 SC/ST		01	--	01	--	--
4.	Assistant Professor	09	--	02	01	01	01	02	01	01
5.	Librarian	01	01	--	--	--	--		--	--

The posts reserved for the Backward category candidates will be filled in by backward category candidates (Domicile of State of Maharashtra) belonging to that particular category only.

If ST candidate is not available then SC candidates can be considered for selection & vice-versa on year to year basis appointment as per the rule of interchange ability.

Reservation for women & disabled persons will be as per rule.

Candidates having knowledge of Marathi will be preferred.

The qualification and pay – scale for the posts of Director, Associate Professor, Assistant Professor, Librarian & Placement Officer are as prescribed by the University of Mumbai AICTE & DTE from time to time.

Applicants who are already employed must send their application through proper channel. Applicants are required to account for breaks, if any in their academic career. The details of the qualification pay – scale & allowance will be supplied on request from applicants.

Candidates belonging to reserved categories should send two Xerox copies of their application along with the attested copy of the Caste Certificate to the Deputy Registrar, Special Cell, University of Mumbai – 400 032.

Application with full details should reach the HON. CHAIRMAN, SAS Institute of Management Studies, Opp to GR Engineering Company, Next to Saidham Complex Saravali, MIDC, Boisar(West), Pin Code- 401 501 **within 15 days** from the date of publication of this advertisement.

CHAIRMAN

Deep Education Society's SAS Institute Management Studies (MMS)

Deep Education Society's

A.G.S. COLLEGE OF EDUCATION (B.ED.)

Survey No.- 151,.Next to Saidham Complex, Saravali Boisar(w) Dist : Thane Pin-401 501

APPLICATIONS ARE INVITED FOR THE FOLLOWING POSTS FROM THE ACADEMIC YEARS 2024-25

UN-AIDED

Sr. No.	Cadre	Subject	Total No. of Posts	Post Reserved for
1.	Principal	-	01	**01-Open**
2.	Assistant Professor	(Education in English, Geography, Science Methods)	03	**01- ST, 01-SC, 01- OBC**
3.	Librarian	-	01	**01- Open**

The posts reserved for the Backward Class candidates will be filled in by backward category candidates (Domicile of State of Maharashtra) belonging to that particular category only.

Reservation for women will be as per University Circular No. BCC/16/74/1998 dated 10th March, 1998. 4% reservation shall be for the persons with disability as per University Circular No. Special Cell/ICC/2019-20/05 dated 05th July, 2019.

Candidates having knowledge of Marathi will be preferred.

"Qualification, Pay Scales and other requirement are as prescribed by the UGC Notification dated 18th July, 2018, Government of Maharashtra Resolution No. Misc- 2018/C.R.56/18/UNI-1, dated 8th March, 2019 and University Circular No. TAAS/(CT)/ICD/2018-19/1241, dated 26th March, 2019 and revised from time to time" The Government Resolution & Circular are available on the **website : mu.ac.in.**

Applicants who are already employed must send their application through proper channel. Applicants are required to account for breaks, if any in their academic career.

Application with full details should reach the Chairman, Deep Education Society's A.G.S. College of Education (B.Ed.), Survey No. - 151, Next to Saidham Complex, Saravali, Boisar (W), Dist. - Palghar 401 501 **within 15 days** from the date of publication of this advertisement. This is University approved advertisement

Sd/

CHAIRMAN

Deep Education Society's

Deep's Degree College

Opp. G.R. Engineering Company, MIDC, Boisar (W), Pin – 401 501

APPLICATIONS ARE INVITED FOR THE FOLLOWING POSTS FROM THE ACADEMIC YEAR 2024-25:

UN-AIDED

Sr. No.	Cadre	Subject	Total No. of Posts	Posts Reserved for
1.	Principal	---	01	01- OPEN
2.	Assistant Professor	B.Sc. in Hospitality Studies 1. Food Production 2. Front Office 3. Food & Beverage Services 4. House Keeping	04	01- SC/ST, 01- DT (A) 01- OBC, 01- OPEN
3.	Assistant Professor	Management	02	01-SC, 01-OPEN
4.	Assistant Professor	Accountancy	02	01-SC, 01-OPEN
5.	Assistant Professor	Commerce	02	01-SC, 01-OPEN
6.	Assistant Professor	Business Law	01	01 OPEN
7.	Assistant Professor	Economics	01	01 OPEN
8	Librarian	--	01	01 OPEN

For Assistant Professor (Horizontal Reservation)
Sportsmen-01

The posts for the reserved category candidates will be filled in by the same category candidates (Domicile of State of Maharashtra) belonging to that particular category only.

Reservation for women will be as per University Circular No. BCC/16/74/1998 dated 10th March, 1998, 4% reservation shall be for the persons with disability as per University Circular No. Special Cell/ICC/2019-20/05 dated 05th July, 2019.

Candidates having knowledge of Marathi will be Preferred.

"Qualification, Pay Scales and other requirement are as prescribed by the UGC Notification dated 18th July, 2018, Government of Maharashtra Resolution No. Misc-2018/C. R. 56/18/UNI-1, dated 8th March, 2019 and University Circular No. TAAS/ (CT)/ICD/2018-19/1241, dated 26th March, 2019 and University Circular CONCOL/15/ of 2013-2014 dated 15th October, 2013 revised from time to time"

The Government Resolution & Circular are available on the **Website: mu.ac.in.**

Applicants who are already employed must send their application through proper channel.

Applicants are required to account for breaks, if any their academic career.

Applications with full details should reach to the HON. CHAIRMAN, Deep's Degree College, Opp. To G.R. Engineering Company, Next to Saidham Complex Saravali, MIDC, Boisar (W), Pin-401501 **within 15 days** from the date of publication of this advertisement. This is University approved advertisement.

Sd/
HON. CHAIRMAN

THE C.E.S. COLLEGE OF ARTS AND COMMERCE
CUNCOLIM, SALCETE-GOA 403 703
(Affiliated to Goa University)

Reg. with UGC under Section 2(f) & 12(b)

Website: cescollege.ac.in Email id.: office@cescollege.ac.in

Application with full bio-data are invited from the Indian citizens for the post of **PRINCIPAL** (Unreserved Category). The required minimum qualifications for the post of Principal are as follows:

A. ELIGIBILITY:

1) Ph.D Degree
2) Professor/Associate Professor with a total service/experience of at least fifteen years of Teaching/Research in Universities, Colleges and other institutions of Higher Education.
3) Minimum of 10 Research Publications in peer reviewed journals as approved by Goa University from time to time or in UGC-listed journals, out of which at least 02 should be in Scopus/Web of Science Journals.
4) A minimum of 110 Research score as per Appendix 11, Table-2 of Goa University Statute SC-16.

B. TENURE

A College Principal shall be appointed for a period of five years.

ESSENTIAL REQUIREMENTS:

a) Knowledge of Konkani Language
b) Certificate of 15 years of Residence in Goa, issued by a competent authority.

DESIRABLE REQUIREMENTS

a) Knowledge of Marathi Language

Pay Scales and Service conditions are as prescribed by UGC, Government of Goa, Goa University &other competent authorities from time to time.

Applicants who are already employed shall send their applications through proper channel.

Applications complete in all respect, with photograph, along with self-certified photocopies of statement of marks of all public examination from S.S.C. onwards, copy of 15 years Residence certificate, Experience certificate, publications, research score sheet etc. should reach the undersigned at the above address **within 20 days** from the date of publication of this advertisement addressed to the Chairman. Appointment is subject to approval of Government of Goa and Goa University.

Place: Cuncolim-Goa (Virendra (Videsh) Dessai)
Date :08.07.2024 Chairman

WANTED

Applications are invited for the post of Perspective in Education and Performing Arts (Music/Dance/Theatre) Fine Arts to be filled in Smt. Indira Gandhi College of Education (B.Ed.) Vasarni, Nanded run by Jawaharlal Nehru Education, Science and Technological Research Trust Nanded Tq. Dist. Nanded. (Permanent Non-Grant). Eligible Candidate should submit their application along with all necessary documents **within 15 days** from the date of advertisement by registered post only.

Sr.	Qualification	No. of Posts	Reservation
1	Perspective in Education	02	Open-02, ST-01, VJ (A) 01, OBC – 01, EWS-01, SEBC-01
2	Pedagogy Subjects	03	
3	Health and Physical Education	1 (Part Time)	
4	Performing Arts (Music/Dance/Theatre) Fine Arts	1 (Part Time)	
	Total	07	
As per Govt. decision dated 25th Jan. 2024 parallel or Horizontal reservation 2 seats for Women Candidates.			

Qualification
The faculty shall possess the following qualification.

A) Perspective in Education or Foundation Courses.
1. Post Graduate Degree in social Science with minimum 55% marks.
2. M.Ed. Degree from a recognized university with minimum 55% marks.
3. SET/NET/Ph.D. in Education

OR

1. Post Graduate (M.A.) Degree in Education with minimum 55% marks.
2. B.Ed. / B.El.Ed. Degree with minimum 55% marks.
3. SET/NET/Ph.D. in Education.

B) Curriculum and Pedagogy Courses:
1. Post Graduate Degree in Science/Mathematics / Social Science/Language with minimum 55% marks.
2. M.Ed. Degree from a recognized university with minimum 55% marks.
3. SET/NET/Ph.D. in Education.

C) Health & Physical Education:
1. Master of Physical Education (M.P.Ed.) with minimum 55% marks.
2. SET/NET/Ph.D. in Physical Education.

D) Performing Arts (Music/Dance/Theatre) Fine Arts:
1. Post Graduate Degree in Fine Arts with minimum 55% marks.
2. SET/NET/Ph.D. in Fine Arts.

Salary and Allowance Pay: Scale as per UGC, State Govt. & Swami Ramanand Teerth Marathwada University Nanded rules from time to time.

Note:
1. Prescribe application from available on the University Website (srtmun.ac.in)
2. No TA and DA for attending interview.
3. Eligible Candidates those who are already in service should submit their application through proper channel.
4. 4% Reservation for Physical Handicapped Candidate.
5. 30% Reservation for Women Candidate.
6. All attested Xerox Copies of certificate and other relevant documents should be attached to the application.

Address for Correspondence:
To,
The Principal,
Smt. Indira Gandhi College of Education (B.Ed.)
Near Dr. Babasaheb Ambedkar Chowk, Nanded – Latur Road Vasarni Nanded. 431603.

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