Association of Indian Universities

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Concept Paper

Theme: *Holistic and Multidisciplinary Education with Technology Integration*

Technical Sessions:

Technical Session–I : *Towards a More Holistic and Multidisciplinary Education and Creating Optimal Learning Environment*

Technical Session–II: *Faculty Development and Student Engagement*

Technical Session–III: *Technology Integration Including Online and Digital Education*

Introduction

The Association of Indian Universities (AIU) organizes Zonal Meets of Vice Chancellors every year wherein issues relating to higher education are discussed. Recommendations of the Zonal Vice Chancellors' Meets are considered in the Annual Meeting of the Association. In the Zonal Vice Chancellors' Meet more than 200 Vice Chancellors/Directors of member Universities/Institutions apart from some educationists, representatives of UGC, MHRD and apex bodies are expected to participate.

The Governing Council of Association of Indian Universities in its 361st Meeting held on November 05, 2020, recommended the theme for 95th AIU AGBM/ National Seminar as formulating "Implementation Strategy for NEP 2020". The five zonal conferences have been planned keeping the main theme in mind.

Accordingly, the proposed theme for AIU North Zone VCs Meet is "***Holistic and Multidisciplinary Education with Technology Integration***". However, in view of the wide spread impact of COVID-19 Pandemic and in the interest of the safety of academic fraternity, Association of Indian Universities proposes to hold Zonal Meets of Vice Chancellors through Virtual Mode.

Technical Session I: *Towards a More Holistic and Multidisciplinary Education and Creating Optimal Learning Environment*

Recommendations in NEP 2020:

India has a long tradition of holistic and multidisciplinary learning, from universities such as Takshashila and Nalanda, to the extensive literatures of India combining subjects across fields. Ancient Indian literary works such as Banabhatta's Kadambari described a good education as knowledge of the 64 Kalaas or arts; and among these 64 'arts' were not only subjects, such as singing and painting, but also 'scientific 'fields, such as chemistry and mathematics, 'vocational ' fields such as carpentry and clothes-making, 'professional 'fields, such as medicine and engineering, as well as 'soft skills' such as communication, discussion, and debate. The very idea that all branches of creative human endeavour, including mathematics, science, vocational subjects, professional subjects, and soft skills should be considered 'arts', has distinctly Indian origins. This notion of a 'knowledge of many arts' or what in modern times is often called the 'liberal arts' (i.e., a liberal notion of the arts) must be brought back to Indian education, as it is exactly the kind of education that will be required for the 21st century.

Assessments of educational approaches in undergraduate education that integrate the humanities and arts with Science, Technology, Engineering and Mathematics (STEM) have consistently showed positive learning outcomes, including increased creativity and innovation, critical thinking and higher-order thinking capacities, problem-solving abilities, teamwork, communication skills, more indepth learning and mastery of curricula across fields, increases in social and moral awareness, etc., besides general engagement and enjoyment of learning. Research is also improved and enhanced through a holistic and multidisciplinary education approach.

A holistic and multidisciplinary education would aim to develop all capacities of human beings -intellectual, aesthetic, social, physical, emotional, and moral in an integrated manner. Such an education will help develop well-rounded individuals that possess critical 21st century capacities in fields across the arts, humanities, languages, sciences, social sciences, and professional, technical, and vocational fields; an ethic of social engagement; soft skills, such as communication, discussion and debate; and rigorous specialization in a chosen field or fields. Such a holistic education shall be, in the long term, the approach of all undergraduate programmes, including those in professional, technical, and vocational disciplines. A holistic and multidisciplinary education, as described so beautifully in India 's past, is indeed what is needed for the education of India to lead the country into the 21st century and the fourth industrial revolution. Even engineering institutions, such as IITs, will move towards more holistic and multidisciplinary education with more arts and humanities. Students of arts and humanities will aim to learn more science and all will make an effort to incorporate more vocational subjects and soft skills.

Imaginative and flexible curricular structures will enable creative combinations of disciplines for study, and would offer multiple entry and exit points, thus, removing currently prevalent rigid boundaries and creating new possibilities for life-long learning. Graduate-level, master's and doctoral education in large multidisciplinary universities, while providing rigorous research-based specialization, would also provide opportunities for multidisciplinary work, including in academia, government, and industry.

Large multidisciplinary universities and colleges will facilitate the move towards high-quality holistic and multidisciplinary education. Flexibility in curriculum and novel and engaging course options will be on offer to students, in addition to rigorous specialization in a subject or

subjects. This will be encouraged by increased faculty and institutional autonomy in setting curricula. Pedagogy will have an increased emphasis on communication, discussion, debate, research, and opportunities for cross-disciplinary and interdisciplinary thinking.

Departments in Languages, Literature, Music, Philosophy, Indology, Art, Dance, Theatre, Education, Mathematics, Statistics, Pure and Applied Sciences, Sociology, Economics, Sports, Translation and Interpretation, and other such subjects needed for a multidisciplinary, stimulating Indian education and environment will be established and strengthened at all HEIs. Credits will be given in all Bachelor's Degree programmes for these subjects if they are done from such departments or through ODL mode when they are not offered in-class at the HEI.

Towards the attainment of such a holistic and multidisciplinary education, the flexible and innovative curricula of all HEIs shall include credit-based courses and projects in the areas of community engagement and service, environmental education, and value-based education. Environment education will include areas such as climate change, pollution, waste management, sanitation, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living. Value-based education will include the development of humanistic, ethical, Constitutional, and universal human values of truth (satya), righteous conduct (dharma), peace (shanti), love (prem), nonviolence (ahimsa), scientific temper, citizenship values, and also life-skills; lessons in seva/service and participation in community service programmes will be considered an integral part of a holistic education. As the world is becoming increasingly interconnected, Global Citizenship Education (GCED), a response to contemporary global challenges, will be provided to empower learners to become aware of and understand global issues and to become active promoters of more peaceful, tolerant, inclusive, secure, and sustainable societies. Finally, as part of a holistic education, students at all HEIs will be provided with opportunities for internships with local industry, businesses, artists, crafts persons, etc., as well as research internships with faculty and researchers at their own or other HEIs/research institutions, so that students may actively engage with the practical side of their learning and, as a by-product, further improve their employability.

The structure and lengths of degree programmes shall be adjusted accordingly. The undergraduate degree will be of either 3 or 4-year duration, with multiple exit options within this period, with appropriate certifications, e.g., a certificate after completing 1 year in a discipline or field including vocational and professional areas, or a diploma after 2 years of study, or a Bachelor 's degree after a 3-year programme. The 4-year multidisciplinary Bachelor's programme, however, shall be the preferred option since it allows the opportunity to experience the full range of holistic and multidisciplinary education in addition to a focus on the chosen major and minors as per the choices of the student. An Academic Bank of Credit (ABC) shall be established which would digitally store the academic credits earned from various recognized HEIs so that the degrees from an HEI can be awarded taking into account credits earned. The 4-year programme may also lead to a degree 'with Research' if the student completes a rigorous research project in their major area(s) of study as specified by the HEI.

HEIs will have the flexibility to offer different designs of Master's programmes: (a) there may be a 2-year programme with the second year devoted entirely to research for those who have completed the 3-year Bachelor 's programme; (b) for students completing a 4-year Bachelor 's programme with Research, there could be a 1-year Master's programme; and (c) there may be an integrated 5-year Bachelor's/Master's programme. Undertaking a Ph.D. shall require either a Master's degree or a 4-year Bachelor's degree with Research. The M.Phil. programme shall be discontinued.

Model public universities for holistic and multidisciplinary education, at par with IITs, IIMs, etc., called MERUs (Multidisciplinary Education and Research Universities) will be set up and will

aim to attain the highest global standards in quality education. They will also help set the highest standards for multidisciplinary education across India.

HEIs will focus on research and innovation by setting up start-up incubation centres; technology development centres; centres in frontier areas of research; greater industry-academic linkages; and interdisciplinary research including humanities and social sciences research. Given the scenario of epidemics and pandemics, it is critical that HEIs take the lead to undertake research in areas of infectious diseases, epidemiology, virology, diagnostics, instrumentation, vaccinology and other relevant areas. HEIs will develop specific hand holding mechanisms and competitions for promoting innovation among student communities. The NRF will function to help enable and support such a vibrant research and innovation culture across HEIs, research labs, and other research organizations.

Proposed Implementation Strategy

Objectives to be achieved

i. Transforming existing curriculums across disciplines offered by HEIs to multi-disciplinary liberal curriculum
ii. Capacity-building of institutions and faculty to formulation and implementation of a multi-disciplinary liberal education framework.
iii. Develop and implement a flexible curriculum that enables multiple entry and exits at the 1st, 2nd, and 3rd year of education while maintaining the rigour of learning.
iv. Initiate a choice-based credit system in the curriculum design and implementation, granting greater freedom to learners to opt for different course beyond the core subjects of their discipline, depending on their interest and credit requirement of the course, and also establish an Academic Bank of Credit.

Action Points

- Formulation of a national-level committee by the General Education Council (GEC) to develop a broader framework for Multidisciplinary Liberal Arts Education as defined in the Clause 10 of the Implementation Plan. This committee may comprise of subject expert, industry experts, and educationists from both multidisciplinary and single disciplinary HEIs, particularly from leading institutions offering multidisciplinary liberal education (Ministry of Education, Centre and State by 2021).

- Set up an Academic Internal Audit team at the level of HEIs for Mapping the existing disciplines and infrastructure of institution to envisage the scope of multidisciplinary education that be provided. This team must include a member of finance department of HEIs to ascertain the need for and allocate budget for capacity building (HEIs by 2021).

- Formulation of institution level committee with faculty representative of each department and external members to develop a holistic and multi-disciplinary curriculum, breaking the binaries of Arts-Science-STEM Education focusing on the knowledge of 64 Kalaas or arts as per the guidelines of National Level Committee (HEIs by 2021).

- Based on the mapping analysis conducted by institutional curriculum assessment committee developing a holistic multiple disciplinary curriculum for various programme/courses to be offered by the HEI as per the IDP (HEIs by 2025).

- Government to establish NAC. NAC to establish framework and guidelines to be followed for accreditation. NAC to provide Graded Autonomy to colleges to design university wide courses (compulsory or optional for arts/sciences and vocational courses) (Government of India NAC by 2030).

- Stage 1 – colleges can initiate their accreditation process by 2023. Stage 2 – All colleges across India will need to ensure one cycle of accreditation by 2030. Stage 3 - 1. Based on outcome of the Stage 1 Accreditation, colleges will need to make the required amends, if applicable, and undergo the next round of accreditation, to meet the minimum grade requirement specified by NAC by 2035. 70-80% of the policy implementation relies on the action of HEIs in tandem with establishment of enabling regulatory framework (Colleges/HEIs by 2030).

- For capacity building of institutions and faculty to develop curriculum that enables multiple entry and exits; HEIs to organise consultative workshops with industry and subject experts from existing multi-disciplinary universities with-in the state and across the country to identify locally and globally relevant areas of studies to orient faculty towards designing, formulating and implementing multidisciplinary curriculum and assessment at the level of the HEIs (HEIs by 2021).

- Adopting a bottom-up approach, allowing for greater participation of faculty in the curriculum design and granting autonomy to faculty members to envisage programmes, design courses depending upon their expertise and area of research, to transform the HEI to multi-disciplinary liberal education institution. These courses may be cross-listed electives or core courses based on the graded autonomy regulations for the colleges (HEIs by 2025).

- Curriculum development workshops and training to be conducted for faculty at national, state and HEI level for developing out-put driven, value education based, multi-disciplinary curriculum which can be run on both online and offline mode (HEIs by 2021).

- HEIs to organise courses and workshops for orienting faculty towards pedagogical practices including activity based, field based, project/lab based, practicum/internship based, community based learning depending on the-type of programme or course being offered (HEIs by 2021).

- Setting up start up incubation centres in HEIs to promote technological development, inter-disciplinary research, industry-academia linkages for each of the Multi-disciplinary programme offered by the HEI to enhance relevance of the course and graduate employability (HEIs by 2021).

- HEIs to develop and establish internship bank for every course offered by them either through offline or online mode. To achieve this focus should be on building relation between academia and industry to facilitate learning by doing for students through internship/apprenticeship and field work to promote employability (HEIs by 2021).

- Establishing an annual curriculum review mechanism for every course by the HEI to keep the curriculum up to date by setting up a university wide Curriculum Review Board as a permanent body at the level of HEI to maintain and sustain quality and relevance of courses offered by HEIs. It is recommended that curriculum is reviewed at least

annually and updated periodically by faculty which is shared with the review board with the scope of inculcating the feedback received from the board (HEIs by 2021).

- Pass ordinance to allow multiple exits and entrances, including lateral entry to courses offered at under-graduate, post-graduate and doctoral level. Ordinance must enable the students to apply for diploma/degree/Doctoral from the university of their choice on the fulfilment of required credits to attain such recognition (Ministry of Education, Centre and State by 2021).

- HEIs to develop programmes that includes independent capsule courses that are complete in themselves of differing durations leading to the grant of certificate, diploma or degree and facilitating multiple exits and entries (HEIs).

- HEIs to offer admissions to courses in addition to programme (HEIs by 2021).

- HEIs to develop a mechanism for mutual recognition of credits that would allow admission to courses in addition to full programmes and recognise credits acquired by the students from different HEIs, accepting lateral entrance to their courses (HEIs).

- HEIs to develop programmes which are so designed that it includes capsule courses that are complete in themselves and can be offered against certificate, diploma and degree courses thus facilitating multiple stages of entry and exits (HEIs by 2021).

- To develop courses that require students to engage in assistantship and internship, as a compulsory/graded component of the course. This shall facilitate learning by doing and enables learners to specialise in a field of study, across programme beginning from certification to degree level courses (HEIs by 2021).
- Develop 3 or 4 year programme that includes the scope of persuing research at undergraduate level including internships/apprenticeship, teaching assistantships and working on independent research projects (HEIs by 2021).

- HEIs to develop 1 year and 2 years Master's programme with courses that can be taken by students with a 4 or 3 years Bachelor's degree or offer an integrated 5-year Bachelor's/Master's programme (HEIs by 2021).

- To design and inculcate flexible entry to Ph.D. programme with either a Master's degree or a 4-year Bachelor's degree with Research or existing 3+2 years of undergraduate and Master's degree (HECI: GEC by 2021).

- To instill in learners the spirit of life-long learning through offline and online courses and establishment of centres for learning by State and Centre for continued learning of students and staff beyond educational institutions (State and Centre by 2022).

- Establishment of a central Academic Bank of Credit (Government of India by 2021).
- Make and pass ordinance that allows HEIs to facilitate credit transfer between Indian and foreign universities, create a mechanism for redeeming credits earned and granting degrees in lieu of the credits (NHERC by 2021).

- Establishment of matrix suggesting minimum credit required for grant of a certificate/diploma/degree at Bachelor's, Master's and Doctoral level (GEC by 2021).

- Parity must be maintained in the credit requirement for course of 1, 2, 3-year duration to facilitate smooth entry and exit for students and to prevent devaluation of 1-2 year or vocational courses (GEC by 2021).

- Credit transfer may be facilitated nationally (across states) and internationally (GEC by 2021).

- Bifurcation of credit requirement between fixed/core components or courses and flexible/elective components or courses.

- Depending on the duration of the programme assign credits to all courses offered at the university (GEC by 2021).

- A framework to the effect must be created. The national-level committee in consultation with members of statutory bodies should develop a broad framework on credit requirement and transferability of credits across HEIs (national and international/public and private), that students must attain to complete a course with clear specification on how much of those credit must come from discipline specific course and other courses. This is to enable credit transfer and accumulation through Academic Bank of Credit (GEC by 2021).

- Establishment of mechanism at the level of HEIs that allows student to register with ABC and deposit and redeem credits against certificate-diploma and degrees through web-portals (HEIs by 2021).

- Credits earned against different courses in different universities to accrue in a student's account to be redeemed against a grant of certificate-diploma-degree once adequate number of credits are attained to be considered a full programme (HEIs by 2021).
- Appointment of Academic Advisors to guide students to design and opt for courses as per the credit requirement of the course-programme being pursued by the students (HEIs by 2021).

- Create activities for physical fitness:
  - On campus activities
  - Tie-up with local centres, in case campus does not have infrastructure
  - In-room activities which don't need additional infrastructure such as yoga, pilates. (HEIs by 2021)

- Eliminate high-stake examinations in sync with the regulations. Have a system in place for: diagnostic assessments, interim assessments, benchmark assessments, formative assessments, summative assessments (HEIs by 2022).

- Establish a revised regulatory framework for permitting ODLs and Online Programmes (HECI by 2021).

- Identify the disciplines or degree programmes which have a demand for ODL, especially in remote rural areas. Have targeted institutions which will offer programmes of interest based on this analysis (Ministry of Education, India by 2021).

- Identify the locations/districts which will require setup of the Learner Centers (admission counselling, access to computer systems, laboratories, studios) created to suit the programmes being accessed from those centres (Ministry of Education, India and State by 2021).

- Identify centralised ODL committee of academics, education technology experts and private players engaging in online learning to build high quality E-Resources, OERs and MOOCs and innovate on assessment methodologies corresponding to the demands of programmes arising from the survey (Ministry of Education, India by 2021).

- Communicate online resources, guidelines and regulatory framework which can be utilised to the HEIs (Ministry of Education, India and State by 2022).

- Plan the ODL/Online Learning Programmes: Curriculum, Infrastructure, Resources, Admissions (HEI by 2022).

- Build the central repository with shared and open access resources for online programmes and ODLs (Target HEI by 2023).

- Develop the ODL/ Online Learning Programmes (HEI by 2023).

- Establish
  1. Learner Centers
  2. An examination centre network with the required regulatory implementation such as CCTV recording
     (HEI by 2023)

- Identify and Deploy the appointed staff for the Learner Centers (admissions, counselling, academic query resolution, IT staff) (HEI by 2023).

- Develop an HEI specific Centre of Distance Education, and an Internal Quality Team with a Monitoring and Evaluation Process (HEI by 2023).

- Set up an accreditation system to monitor and evaluate the ODL/Online Learning Programmes (NAAC/NAC by 2021).

- Setup high quality support Centres for SEDG Students (HEIs by 2035).

- Set up focused counselling (academic and professional) for SEDG Students (HEIs by 2023).

- National Scholarship Portal to have an integrated tracking mechanism, which captures demand and supply of financial needs of students (Ministry of Education, India by 2035).

Technical Session II: *Faculty Development and Student Engagement*

Recommendations in NEP 2020:

The most important factor in the success of higher education institutions is the quality and engagement of its faculty. Acknowledging the criticality of faculty in achieving the goals of higher education, various initiatives have been introduced in the past several years to systematize recruitment and career progression, and to ensure equitable representation from various groups in the hiring of faculty. Compensation levels of permanent faculty in public

institutions have also been increased substantially. Various initiatives have also been taken towards providing faculty with professional development opportunities. However, despite these various improvements in the status of the academic profession, faculty motivation in terms of teaching, research, and service in HEIs remains far lower than the desired level. The various factors that lie behind low faculty motivation levels must be addressed to ensure that each faculty member is happy, enthusiastic, engaged, and motivated towards advancing her/his students, institution, and profession. To this end, the policy recommends the following initiatives to achieve the best, motivated, and capable faculty in HEIs.

As the most basic step, all HEIs will be equipped with the basic infrastructure and facilities, including clean drinking water, clean working toilets, blackboards, offices, teaching supplies, libraries, labs, and pleasant classroom spaces and campuses. Every classroom shall have access to the latest educational technology that enables better learning experiences.

Teaching duties also will not be excessive, and student-teacher ratios not too high, so that the activity of teaching remains pleasant and there is adequate time for interaction with students, conducting research, and other university activities. Faculty will be appointed to individual institutions and generally not be transferable across institutions so that they may feel truly invested in, connected to, and committed to their institution and community.

Faculty will be given the freedom to design their own curricular and pedagogical approaches within the approved framework, including textbook and reading material selections, assignments, and assessments. Empowering the faculty to conduct innovative teaching, research, and service as they see best will be a key motivator and enabler for them to do truly outstanding, creative work.

Excellence will be further incentivized through appropriate rewards, promotions, recognitions, and movement into institutional leadership. Meanwhile, faculty not delivering on basic norms will be held accountable.

In keeping with the vision of autonomous institutions empowered to drive excellence, HEIs will have clearly defined, independent, and transparent processes and criteria for faculty recruitment. Whereas the current recruitment process will be continued, a 'tenure-track' i.e., suitable probation period shall be put in place to further ensure excellence. There shall be a fast-track promotion system for recognizing high impact research and contribution. A system of multiple parameters for proper performance assessment, for the purposes of 'tenure' i.e., confirmed employment after probation, promotion, salary increases, recognitions, etc., including peer and student reviews, innovations in teaching and pedagogy, quality and impact of research, professional development activities, and other forms of service to the institution and the community, shall be developed by each HEI and clearly enunciated in it 's Institutional Development Plan (IDP).

The presence of outstanding and enthusiastic institutional leaders that cultivate excellence and innovation is the need of the hour. Outstanding and effective institutional leadership is extremely important for the success of an institution and of its faculty. Excellent faculty with high academic and service credentials as well as demonstrated leadership and management skills will be identified early and trained through a ladder of leadership positions. Leadership positions shall not remain vacant, but rather an overlapping time period during transitions in leadership shall be the norm to ensure the smooth running of institutions. Institutional leaders will aim to create a culture of excellence that will motivate and incentivize outstanding and innovative teaching, research, institutional service, and community outreach from faculty members and all HEI leaders.

Effective learning requires a comprehensive approach that involves appropriate curriculum, engaging pedagogy, continuous formative assessment, and adequate student support. The curriculum must be interesting and relevant, and updated regularly to align with the latest knowledge requirements and to meet specified learning outcomes. High-quality pedagogy is then necessary to successfully impart the curricular material to students; pedagogical practices determine the learning experiences that are provided to students, thus directly influencing learning outcomes. The assessment methods must be scientific, designed to continuously improve learning and test the application of knowledge. Last but not least, the development of capacities that promote student wellness such as fitness, good health, psycho-social well-being, and sound ethical grounding are also critical for high-quality learning. Thus, curriculum, pedagogy, continuous assessment, and student support are the cornerstones for quality learning. Along with providing suitable resources and infrastructure, such as quality libraries, classrooms, labs, technology, sports/recreation areas, student discussion spaces, and dining areas, a number of initiatives will be required to ensure that learning environments are engaging and supportive, and enable all students to succeed.

First, in order to promote creativity, institutions and faculty will have the autonomy to innovate on matters of curriculum, pedagogy, and assessment within a broad framework of higher education qualifications that ensures consistency across institutions and programmes and across the ODL, online, and traditional 'in-class' modes. Accordingly, curriculum and pedagogy will be designed by institutions and motivated faculty to ensure a stimulating and engaging learning experience for all students, and continuous formative assessment will be used to further the goals of each programme. All assessment systems shall also be decided by the HEI, including those that lead to final certification. The Choice Based Credit System (CBCS) will be revised for instilling innovation and flexibility. HEIs shall move to a criterion-based grading system that assesses student achievement based on the learning goals for each programme, making the system fairer and outcomes more comparable. HEIs shall also move away from high-stakes examinations towards more continuous and comprehensive evaluation.

Second, each institution will integrate its academic plans ranging from curricular improvement to quality of classroom transaction - into its larger Institutional Development Plan (IDP). Each institution will be committed to the holistic development of students and create strong internal systems for supporting diverse student cohorts in academic and social domains both inside and outside formal academic interactions in the classroom. For example, all HEIs will have mechanisms and opportunities for funding of topic-centred clubs and activities organized by students with the help of faculty and other experts as needed, such as clubs and events dedicated to science, mathematics, poetry, language, literature, debate, music, sports, etc. Over time, such activities could be incorporated into the curriculum once appropriate faculty expertise and campus student demand is developed. Faculty will have the capacity and training to be able to approach students not just as teachers, but also as mentors and guides.

Third, students from socio-economically disadvantaged backgrounds require encouragement and support to make a successful transition to higher education. Universities and colleges will thus be required to set up high-quality support centres and will be given adequate funds and academic resources to carry this out effectively. There will also be professional academic and career counselling available to all students, as well as counsellors to ensure physical, psychological and emotional well-being.

Fourth, ODL and online education provide a natural path to increase access to quality higher education. In order to leverage its potential completely, ODL will be renewed through concerted, evidence-based efforts towards expansion while ensuring adherence to clearly articulated standards of quality. ODL programmes will aim to be equivalent to the highest

quality in-class programmes available. Norms, standards, and guidelines for systemic development, regulation, and accreditation of ODL will be prepared, and a framework for quality of ODL that will be recommendatory for all HEIs will be developed.

Finally, all programmes, courses, curricula, and pedagogy across subjects, including those in class, online, and in ODL modes as well as student support will aim to achieve global standards of quality.

Proposed Implementation Strategy

Objectives to be achieved

i. Provide an enabling working environment
ii. Incentivize and promote excellence in teaching, research and service to HEI and community at large
iii. Enhance faculty autonomy through enabling them to teach courses in their area of interest, expertise and research to motivate and energize faculty members.
iv. Developing and promoting a sustainable framework for building a cadre of outstanding and enthusiastic institutional leaders within HEIs
v. Provide a holistic quality educational experience to students which focusses on learning outcomes, physical and mental wellness, ethical grounding, and formative assessment.
vi. Implementation of a Choice Based Credit System.
vii. Increase access to quality education though Online Distance Learning (ODL).
viii. Increase access to quality education though Financial Support.

Action Points

- Formulate an internal audit committee for mapping and gauging needs for developing facility and infrastructure development requirements (HEIs by 2021).

- Conduct internal audit to gauge the current state of basic infrastructure, map areas of development and prepare a budget estimate for seeking funds. This committee must include a member of internal Finance team (HEIs by 2021).

- Take capacity building measures to facilitate the following: a) Clean drinking water. b) clean toilets. c) office space to individual faculty. d) teaching supplies in terms of (chalk, pen, basic stationaries, access to printer and Wi-Fi). e) Access to well-equipped Libraries and Labs. f) Technology-enabled classrooms. g) Keep the campus and classrooms clean and pleasant (HEIs by 2025).

- Develop a framework of Key Accountability and Responsibilities Matrix (KARMA) inclusive of Teaching, Research and Administrative responsibilities which specifies a. The number of teaching hours that a faculty at a given level (Assistant Professor- Associate Professor- Professor) must engage in on a weekly basis, b. Office hours to be kept by faculty on a weekly basis for students dealing and interaction beyond classroom interaction. c. The amount of time that faculty must invest in research in each week and the expected research output at the end of a given period (depending on the nature of discipline); and d. a framework specifying and recognising individual's contribution towards institution building and administrative responsibilities. The

framework must enable faculty to devote time for research, student interaction (office hours), and institution building besides the teaching (2021).

- KARMA must consider the current responsibilities vis-à-vis, teaching, research, and service to HEI/administrative responsibilities. A balance must be kept between teaching, research, and administrative work allocation across levels. KARMA should set clearly defined goals for faculty to be attained against Teaching, Research and Administrative work on the basis of which their performance would be assessed. This framework must include clear timeline for an individual to be moved from probation period to tenure track along with the goals to be reached by an individual in terms of teaching, research, and institution/community services (HEIs by 2021).

- Every HEI should set up a Human Resources Department (HR) which would look after employee life cycle within the institution from entry to a respectful exit (HEIs by 2021).

- HR department of Institutions should develop a well-defined, and transparent Performance Evaluation Matrix or a Framework for Promotion, Recognition, Movement to institutional leadership position which may be considered as a foundation for promotion and appraisal.

- Tenure track, promotion, salary increment, recognition should be based on: Peer & Student Review/feedback, Innovation in teaching and learning, Quality and impact of research, professional development activities, services to institution and community (HEIs by 2021).

- To promote quality research and ethical practices, institutions while assessing faculty research output must consider keeping both qualitative and quantitative measures to gauge research output (HEIs by 2021).
- Instituting Institution-level awards for excellence and innovation in Teaching, Research, Institution Building and National Building through community service (HEIs by 2021).

- Instituting National and State level awards for excellence and innovation in Teaching, Research, Institution Building and National Building through community service (HEIs by 2021).

- Developing a well-defined, independent, transparent process and criteria for recruitment at various levels (Academic Performance Indicator can be considered). For this purpose:

  a. Clearly defined Job description aligned with KARMA should be created by HR in consultation with Academic deans.
  b. Eligibility and Years of experience needed at a given level (as applicable).
  c. Research output (as per the level).
  d. Internal selection board should be constituted comprising of Subject Expert, Research expert, Members of the department, External experts (optional), Member of Internal HR for Institutional fitment and salary parity). This needs to be in sync with the regulations.
  (HEIs by 2021)

- Board of Governance to ensure elimination of political interference in recruitment/faculty appointments (HEIs by 2021).

- The faculty student ratio must be maintained as per the HECI defined policy. In the liberal Arts model, where the courses are cross-listed or offered university wide, resulting in higher student numbers in certain courses; Assistant Instructor or Co-instructors must be appointed to maintain the Student Teacher Ratio (STR) (HEIs by 2025).

- It is suggested that senior year students, who have maintained an exemplary academic record and have secured high grade in a given subject may also be appointed as Teaching Assistants under faculty members who have high number of students in a class to maintain STR to ensure individual attention and promote effective learning and reduce the burden on individual faculty (HEIs by 2021).

- To enhance an individual's investment towards their institution and motivating faculty to contribute to institution building, transferring faculty members from one institution to another must be restricted. In view of this, a policy should be established by the regulatory body. Temporary teaching of courses as visiting faculty or research collaboration as visiting researcher should be allowed across HEIs (NHERC by 2021).

- Capacity Building measures to be taken by institutions to train and orient faculty in designing effective curriculum as per the multi-disciplinary liberal arts model and adopt innovative pedagogy for both offline and online education. To this effect, the following points can be considered;

    a. Mapping the existing training needs of faculty w.r.t curriculum development and pedagogy.
    b. Offering online/offline courses and workshops for orienting faculty towards graduate attributes/ output driven curriculum designs and pedagogy
    c. Engaging faculty in discussions and seminars on curriculum design, development, and pedagogical practices to ensure a bottom-up approach in institutional transformation towards becoming a multi-disciplinary liberal arts educational institution.

- Based on Graded Autonomy, Institutions should be allowed to set up guidelines for empowering faculty by providing the freedom and flexibility to adopt innovative pedagogy, and design the curricula, including deciding upon reading material and textbooks, designing assignments and assessments while following the approved framework (HEIs by 2021).

- Aligning the teaching and research interest of the faculty by considering the expertise of faculty during teaching allocation and enabling the faculty to inform their teaching with research. A Teaching, Research, and Interdisciplinarity Development Office (TRIDEO) can be instituted at the Level of HEIs for this purpose. Assistant/Associate Deans (school-wise) or HoDs can be a part of this Office, engaged in recognising and aligning faculty's teaching and research interest where possible. The TRIO should also be responsible for: a) Organising faculty development programmes/workshop annually and b) Organising research and publication related workshop annually (HEIs by 2021).

- Encourage faculty to design elective courses as per their expertise which may be offered school-wise or university wide as per CBCS in the Liberal Arts model (HEIs by 2021).

- Setup a process to ensure that excellent faculty with high academic and service credentials as well as leadership and management skills should be identified early on in their careers and trained through a ladder of leadership positions. Overlapping

period during transitions in leadership shall be the norm. The Leadership for Academician Programme (LEAP), a three-week leadership training programme with 2 weeks training in India and 1 week abroad under Padit Madan Mohan Malaviya National Mission on Teachers and Teaching Scheme can be looked out for annual trainings (HEIs by 2021).

- Setup high quality support Centres for SEDG Students (HEIs by 2035).

- Set up focused counselling (academic and professional) for SEDG Students (HEIs by 2030).

- National Scholarship Portal to have an integrated tracking mechanism, which captures demand and supply of financial needs of students (Ministry of Education, India by 2035).

Technical Session III: *Technology Integration Including Online and Digital Education*

Recommendations in NEP 2020:

India is a global leader in information and communication technology and in other cutting-edge domains, such as space. The Digital India Campaign is helping to transform the entire nation into a digitally empowered society and knowledge economy. While education will play a critical role in this transformation, technology itself will play an important role in the improvement of educational processes and outcomes; thus, the relationship between technology and education at all levels is bidirectional.

Given the explosive pace of technological development allied with the sheer creativity of techsavvy teachers and entrepreneurs including student entrepreneurs, it is certain that technology will impact education in multiple ways, only some of which can be foreseen at the present time. New technologies involving artificial intelligence, machine learning, block chains, smart boards, handheld computing devices, adaptive computer testing for student development, and other forms of educational software and hardware will not just change what students learn in the classroom but how they learn, and thus these areas and beyond will require extensive research both on the technological as well as educational fronts.

Use and integration of technology to improve multiple aspects of education will be supported and adopted, provided these interventions are rigorously and transparently evaluated in relevant contexts before they are scaled up. An autonomous body, the National Educational Technology Forum (NETF), will be created to provide a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning, administration, and so on, both for school and higher education. The aim of the NETF will be to facilitate decision making on the induction, deployment, and use of technology, by providing to the leadership of education institutions, State and Central governments, and other stakeholders, the latest knowledge and research as well as the opportunity to consult and share best practices. The NETF will have the following functions:

a)provide independent evidence-based advice to Central and State Government agencies on technology-based interventions; b) build intellectual and institutional capacities in educational technology; c) envision strategic thrust areas in this domain; and d) articulate new directions for research and innovation.

To remain relevant in the fast-changing field of educational technology, the NETF will maintain a regular inflow of authentic data from multiple sources including educational technology innovators and practitioners and will engage with a diverse set of researchers to analyze the data. To support the development of a vibrant body of knowledge and practice, the NETF will organize multiple regional and national conferences, workshops, etc. to solicit inputs from national and international educational technology researchers, entrepreneurs, and practitioners.

The thrust of technological interventions will be for the purposes of improving teaching learning and evaluation processes, supporting teacher preparation and professional development, enhancing educational access, and streamlining educational planning, management, and administration including processes related to admissions, attendance, assessments, etc.

A rich variety of educational software, for all the above purposes, will be developed and made available for students and teachers at all levels. All such software will be available in all major Indian languages and will be accessible to a wide range of users including students in remote areas and Divyang students. Teaching-learning e-content will continue to be developed by all States in all regional languages, as well as by the NCERT, CIET, CBSE, NIOS, and other bodies/institutions, and will be uploaded onto the DIKSHA platform. This platform may also be utilized for Teacher 's Professional Development through e-content. CIET will be strengthened to promote and expand DIKSHA as well as other education technology initiatives. Suitable equipment will be made available to teachers at schools so that teachers can suitably integrate e-contents into teaching-learning practices. Technology-based education platforms, such as DIKSHA/SWAYAM, will be better integrated across school and higher education, and will include ratings/reviews by users, so as to enable content developers create user friendly and qualitative content.

Particular attention will need to be paid to emerging disruptive technologies that will necessarily transform the education system. When the 1986/1992 National Policy on Education was formulated, it was difficult to predict the disruptive effect that the internet would have brought. Our present education system's inability to cope with these rapid and disruptive changes places us individually and nationally at a perilous disadvantage in an increasingly competitive world. For example, while computers have largely surpassed humans in leveraging factual and procedural knowledge, our education at all levels excessively burdens students with such knowledge at the expense of developing their higher-order competencies.

This policy has been formulated at a time when an unquestionably disruptive technology - Artificial Intelligence (AI) 3D/7D Virtual Reality - has emerged. As the cost of AI-based prediction falls, AI will be able to match or outperform and, therefore, be a valuable aid to even skilled professionals such as doctors in certain predictive tasks. AI's disruptive potential in the workplace is clear, and the education system must be poised to respond quickly. One of the permanent tasks of the NETF will be to categorize emergent technologies based on their potential and estimated timeframe for disruption, and to periodically present this analysis to MHRD. Based on these inputs, MHRD will formally identify those technologies whose emergence demands responses from the education system.

In response to MHRD's formal recognition of a new disruptive technology, the National Research Foundation will initiate or expand research efforts in the technology. In the context of AI, NRF may consider a three-pronged approach: (a) advancing core AI research, (b) developing and deploying application-based research, and (c) advancing international research efforts to address global challenges in areas such as healthcare, agriculture, and climate change using AI.

HEIs will play an active role not only in conducting research on disruptive technologies but also in creating initial versions of instructional materials and courses including online courses in cutting-edge domains and assessing their impact on specific areas such as professional education. Once the technology has attained a level of maturity, HEIs with thousands of students will be ideally placed to scale these teaching and skilling efforts, which will include targeted training for job readiness. Disruptive technologies will make certain jobs redundant, and hence approaches to skilling and deskilling that are both efficient and ensure quality will be of increasing importance to create and sustain employment. Institutions will have autonomy to approve institutional and non-institutional partners to deliver such training, which will be integrated with skills and higher education frameworks.

Universities will aim to offer Ph.D. and Masters programmes in core areas such as Machine Learning as well as multidisciplinary fields "AI + X" and professional areas like health care, agriculture, and law. They may also develop and disseminate courses in these areas via platforms, such as SWAYAM. For rapid adoption, HEIs may blend these online courses with traditional teaching in undergraduate and vocational programmes. HEIs may also offer targeted training in low expertise tasks for supporting the AI value chain such as data annotation, image classification, and speech transcription. Efforts to teach languages to school students will be dovetailed with efforts to enhance Natural Language Processing for India's diverse languages.

As disruptive technologies emerge, schooling and continuing education will assist in raising the general populace 's awareness of their potential disruptive effects and will also address related issues. This awareness is necessary to have informed public consent on matters related to these technologies. In school, the study of current affairs and ethical issues will include a discussion on disruptive technologies such as those identified by NETF/MHRD. Appropriate instructional and discussion materials will also be prepared for continuing education.

Data is a key fuel for AI-based technologies, and it is critical to raise awareness on issues of privacy, laws, and standards associated with data handling and data protection, etc. It is also necessary to highlight ethical issues surrounding the development and deployment of AI-based technologies. Education will play a key role in these awareness raising efforts. Other disruptive technologies that are expected to change the way we live, and, therefore, change the way we educate students, include those relating to clean and renewable energy, water conservation, sustainable farming, environmental preservation, and other green initiatives; these will also receive prioritized attention in education.

New circumstances and realities require new initiatives. The recent rise in epidemics and pandemics necessitates that we are ready with alternative modes of quality education whenever and wherever traditional and in-person modes of education are not possible. In this regard, the National Education Policy 2020 recognizes the importance of leveraging the advantages of technology while acknowledging its potential risks and dangers. It calls for carefully designed and appropriately scaled pilot studies to determine how the benefits of online/digital education can be reaped while addressing or mitigating the downsides. In the meantime, the existing digital platforms and ongoing ICT-based educational initiatives must be optimized and expanded to meet the current and future challenges in providing quality education for all.

However, the benefits of online/digital education cannot be leveraged unless the digital divide is eliminated through concerted efforts, such as the Digital India campaign and the availability of affordable computing devices. It is important that the use of technology for online and digital education adequately addresses concerns of equity.

Teachers require suitable training and development to be effective online educators. It cannot be assumed that a good teacher in a traditional classroom will automatically be a good teacher in an online classroom. Aside from changes required in pedagogy, online assessments also require a different approach. There are numerous challenges to conducting online examinations at scale, including limitations on the types of questions that can be asked in an online environment, handling network and power disruptions, and preventing unethical practices. Certain types of courses/subjects, such as performing arts and science practical have limitations in the online/digital education space, which can be overcome to a partial extent with innovative measures. Further, unless online education is blended with experiential and activity-based learning, it will tend to become a screen-based education with limited focus on the social, affective and psychomotor dimensions of learning.

Given the emergence of digital technologies and the emerging importance of leveraging technology for teaching-learning at all levels from school to higher education, this Policy recommends the following key initiatives:

(a) Pilot studies for online education: Appropriate agencies, such as the NETF, CIET, NIOS, IGNOU, IITs, NITs, etc. will be identified to conduct a series of pilot studies, in parallel, to evaluate the benefits of integrating education with online education while mitigating the downsides and also to study related areas, such as, student device addiction, most preferred formats of e-content, etc. The results of these pilot studies will be publicly communicated and used for continuous improvement.

(b) Digital infrastructure: There is a need to invest in creation of open, interoperable, evolvable, public digital infrastructure in the education sector that can be used by multiple platforms and point solutions, to solve for India's scale, diversity, complexity and device penetration. This will ensure that the technology-based solutions do not become outdated with the rapid advances in technology.

(c) Online teaching platform and tools: Appropriate existing e-learning platforms such as SWAYAM, DIKSHA, will be extended to provide teachers with a structured, user-friendly, rich set of assistive tools for monitoring progress of learners. Tools, such as, two-way video and two way-audio interface for holding online classes are a real necessity as the present pandemic has shown.

(d) Content creation, digital repository, and dissemination: A digital repository of content including creation of coursework, Learning Games & Simulations, Augmented Reality and Virtual Reality will be developed, with a clear public system for ratings by users on effectiveness and quality. For fun based learning student-appropriate tools like apps, gamification of Indian art and culture, in multiple languages, with clear operating instructions, will also be created. A reliable backup mechanism for disseminating e-content to students will be provided.

(e) Addressing the digital divide: Given the fact that there still persists a substantial section of the population whose digital access is highly limited, the existing mass media, such as television, radio, and community radio will be extensively used for telecast and broadcasts. Such educational programmes will be made available 24/7 in different languages to cater to the varying needs of the student population. A special focus on content in all Indian languages will be emphasized and required; digital content will need to reach the teachers and students in their medium of instruction as far as possible.

(f) Virtual Labs: Existing e-learning platforms such as DIKSHA, SWAYAM and SWAYAMPRABHA will also be leveraged for creating virtual labs so that all students have equal access to quality practical and hands-on experiment-based learning experiences. The

possibility of providing adequate access to SEDG students and teachers through suitable digital devices, such as tablets with pre-loaded content, will be considered and developed.

(g) Training and incentives for teachers: Teachers will undergo rigorous training in learner-centric pedagogy and on how to become high-quality online content creators themselves using online teaching platforms and tools. There will be emphasis on the teacher's role in facilitating active student engagement with the content and with each other.

(h)Online assessment and examinations: Appropriate bodies, such as the proposed National Assessment Centre or PARAKH, School Boards, NTA, and other identified bodies will design and implement assessment frameworks encompassing design of competencies, portfolio, rubrics, standardized assessments, and assessment analytics. Studies will be undertaken to pilot new ways of assessment using education technologies focusing on 21st century skills.

(i) Blended models of learning: While promoting digital learning and education, the importance of face-to-face in-person learning is fully recognized. Accordingly, different effective models of blended learning will be identified for appropriate replication for different subjects.

(j) Laying down standards: As research on online/digital education emerges, NETF and other appropriate bodies shall set up standards of content, technology, and pedagogy for online/digital teaching-learning. These standards will help to formulate guidelines for e-learning by States, Boards, schools and school complexes, HEIs, etc.

Proposed Implementation Strategy

Objectives to be achieved

i. Encouraging and incentivizing research in technology, in general and technology use in education, in particular.
ii. Interdisciplinary research where education departments collaborate with technology centric department for meaningful research and development.
iii. Adaptation of technology at the HEIs for pedagogical innovation, learning experience and research.
iv. In particular, latest technology should be adopted for efficient functioning of administrative tasks such as admission, examination processes, and other administrative tasks.
v. Raise awareness on issues of privacy, laws, and standards associated with data handling and data protection at the HEIs.
vi. Preparing against disruptive technology by change management.
vii. Planning and implementing an effective Pilot Programme for online education, which can eventually be scaled across the complexities of the Indian Higher Education landscape.
viii. Create digital learning content which case be used for implementing online learning by advancing the existing initiatives such as SWAYAM and DIKSHA. This would comprise digital repositories of learning material and MOOCs.
ix. Utilise Virtual Reality, Augmented Reality and other forms of technology to make the online learning process more enjoyable, and enable the digitalisation of experiential learning, including virtual labs.

x.   Build the national technology infrastructural capacity to ensure that the technology is not only to improve its penetration, but also to ensure it is scalable and adaptable to constant evolution in technology.

xi.   Create initiatives to train and mentor teachers to adapt to online teaching and learning, and utilise it effectively for online classes, preparing e-learning material and conducting online assessments.

Action Points

- Establishment of an autonomous body, the National Educational Technology. Forum (NETF) which will be created to provide a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning, administration, and so on, both for school and higher education (MoE by 2023).

- Representatives from the central government, state governments, industry and VCs of universities and Principals of colleges to become members of NETF. MoE to appoint the Chairperson, treasury and executive members of NETF from the members of NETF (MoE by 2023).

- NETF to be funded by the GoI (Government of India by 2023).

- NETF to collaborate with leading HEIs, corporates and departments of government bodies involved in cutting edge technology useful in education (NETF by 2023).

- NETF to organise capacity building programme for its members (VCs and principals) to facilitate decision making on the induction, deployment, and use of technology (NETF by 2023).

- HEIs to have an office of technology and innovation to organise in-house workshops and training sessions for the purposes of improving teaching, learning, research and evaluation processes, supporting teacher preparation and professional development, enhancing educational access, and streamlining educational planning, management, and administration including processes related to admissions, attendance, assessments, etc. (HEIs by 2023).

- NETF to categorize emergent technologies based on their potential and estimated timeframe for disruption, and to periodically present this analysis to MoE (NETF by 2022).

- MoE will formally identify those technologies whose emergence demands responses from the education system (MoE by 2022).

- The National Research Foundation will initiate or expand research efforts in the technology. In the context of AI, NRF may consider a three-pronged approach:
    (a) advancing core AI research
    (b) developing and deploying application-based research,
    (c) advancing international research efforts to address global challenges in areas such as healthcare, agriculture, and climate change using AI (NRF by 2022).

- HEIs to aim to offer Ph.D. and Masters programmes in core areas such as Machine Learning as well as multidisciplinary fields "AI + X" and professional areas like health care, agriculture, and law (HEIs by 2023).

- They may also develop and disseminate courses in these areas via platforms, such as SWAYAM. For rapid adoption, HEIs may blend these online courses in higher education (HEIs by 2023).
- HEIs may also offer targeted training in low expertise tasks for supporting the AI value chain such as data annotation, image classification, and speech transcription (HEIs by 2023).

- Appropriate instructional and discussion materials will also be prepared by the HEIs for continuing education (HEIs by 2023).

- HEIs to teach courses and organise workshops to highlight ethical issues surrounding the development and deployment of AI-based technologies (HEIs by 2021).

- HEIs to start courses and organise workshops to educate students, include those relating to clean and renewable energy, water conservation, sustainable farming, environmental preservation, and other green initiatives (HEIs by 2021).

- Form an Expert Committee of various entities including NETF, CIET, Open Educations Institutions (NIOS, IGNOU), private and public technology organisations and other leading HEIs across India based on parameters such as ranking, successful online education programmes to plan a pilot study (Ministry of Education, Central by 2021).

- Identify selected high-reputation Universities to participate in the pilot study. Criteria to be used could include – global and domestic ranking, past record of online programme, QS E-Lead Certification for online T&L, accreditation score (Ministry of Education, Central by 2021).

- Identify incentives for the selected universities that will take part in the pilot study. This could include accreditation score, ranking benefits (Ministry of Education, Central by 2021).

- Complete the pilot study (HEIs by 2022).

- Evaluate the outcome of the pilot study to build the digital infrastructure, content and training programmes (Ministry of Education, Central by 2023).

- Tie up with private organisations to come up with subsidized offers on laptops, Wi-Fi, software for HEIs and their teachers/students (Ministry of Education, India by 2022).

- Build the power and internet infrastructural capacity, especially in rural India through programmes such as Digital India (Ministry of Education, India by 2025).

- Develop learner centers in rural India which enables students with hardware, software and connectivity to learn remotely. This should be set up particularly at a Panchayat level (HEIs by 2023).

- Implement a scheme called 'Donate a Device' by which devices can be donated and then used to empower students of SEDG or rural areas (Ministry of Education, India by 2023).

- Form a Dedicated Centre to drive the technology content, tools and platforms. This committee to include bodies such as NETF, AIU, and representation from open

institutions such as IGNOU, leading universities of India, and private players. Universities should represent a diverse set of regions, disciplines and students. (Ministry of Education, Central by 2021).

- Assess existing initiatives such as SWAYAM, DIKSHA to understand potential improvisations in the content, and build a plan for developing a central repository (DCTI by 2022).

- Develop central repository including MOOCs, Online learning content, online assessment, platform recommendations, and evaluation methodologies (Target HEIs by 2023).

- Innovate enhancing online T&L through augmented reality, virtual reality, gamification, language translations to engage students more effectively, and also to successfully implement experiential learning, including virtual labs (DCTI, Ministry of Education, Centre, AIU, HECI, NET by 2023).

- Develop teacher training programmes: online courses and workshops, on how to use technology effectively for teaching and learning, online assessments and evaluations, and adequate engagement of students virtually (HEI, Ministry of Education, Centre, AIU, HECI, NETF by 2023).

- Tie-up with OPMs to identify means to enable teachers to adapt their curriculum to an online environment (HEIs by 2023).