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PRAGMATIC EDUCATION POLICY: IMPLEMENTATION STRATEGIES IN RESEARCH AND TECHNOLOGY

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Y S Siddegowda

In today's world, research and innovation constitute the neo-quantum of the academic strength of a nation. India intends to impact the global academia by remarkable contributions in research by expanding the frontiers of human intellect. Hence, it is pivotal to develop a robust system that fosters research and innovation. It is predicted that India will be the largest economy in the world by 2030-2032 with an estimated GDP of 9 trillion dollars. This is in lieu with the PMs recent call on leveraging the Fourth Industrial Revolution to take India to new heights. Taking things forward, the comprehensive National Education Policy–2020 has been introduced. It seeks to bring about a paradigm shift through its transformational reforms in education on the foundational pillars of Access, Equity, Quality, Affordability and Accountability, and is aligned with the 2030 Agenda for Sustainable Development, which aims to transform India into a vibrant knowledge society and global knowledge superpower. Nations no longer compete for industrial capacity or access to natural resources; it is no about skilled workers, intellectual property and knowledge.

PRELUDE

It is predicted that India will be the largest economy in the world by 2030-2032 with an estimated GDP of 9 trillion dollars. It is evident that the nine trillion economy will be driven by knowledge resources and not only by natural resources of the country. This is in lieu with the PMs recent call on leveraging the Fourth Industrial Revolution to take India to new heights. Taking things forward, the comprehensive

National Education Policy 2020 has been introduced. This policy is a watershed moment for the Indian Education System, which is bold, comprehensive and envisages large scale transformational well-reasoned reforms.

A competently written compendium, the policy overhauls the existing education system by bringing about a pragmatic shift in its content. In the arena of Higher Education, NEP-2020 has outlined an ambitions task of making education more holistic, flexible, multidisciplinary, creating multi entry and exit points in a four-year degree programme, catalysing research, improving faculty support and encouraging internationalis]ation. It seeks to bring about a paradigm shift through its transformational reforms in education on the foundational pillars of Access, Equity, Quality, Affordability and Accountability, and is aligned with the 2030 Agenda for Sustainable Development, which aims to transform India into a vibrant knowledge society and global knowledge superpower. For our massive human resource potential to be realised and tapped needs the effective implementation of this dynamic policy. It is heartening that the policy states education as a public good and public education system is the foundation of a vibrant democratic society. It is public education that contributes to the building of nations, culturally, and technologically and the building of a humane society.

The underlying aims of higher education is to develop good, thoughtful, well-rounded, and creative individuals. Higher education institution's will offer holistic and multidisciplinary quality education that will enable students to study one or more specialised areas of interest at a deep level, and also develop character, ethical and constitutional values, intellectual curiosity, scientific temper, creativity, spirit of service, and 21st century capabilities across a range of disciplines including sciences, social sciences, arts, humanities, languages, as well as professional, technical, and vocational subjects.

Indian higher education is the second largest educational system in the world, and has a great potential to compete with global universities. In order to realise the contributions of higher education towards nation building, a transformative and innovative approach would be required across all verticals of higher education—from curricula

and pedagogy to the use of technology to partnerships, governance and funding. Building rapid progress for the future higher education would requires a committed and concerted effort from all stakeholders involved, i.e., academia, industry, and the government. For capital human capital theory, higher education is an effective tool to develop science and technological capabilities that are required for a standard of living in a global knowledge economy. (*Ding and Zeng, 2015)*. The world is moving from manufacturing-based economies towards knowledge-based economies that rely heavily on scientific research and a trained workforce. Nations no longer compete for industrial capacity or access to natural resources; it is no about skilled workers, intellectual property and knowledge.

SIGNIFICANCE OF RESEARCH AND ITS IMPLEMENTATION

In today's world, research and innovation constitute the neo-quantum of the academic strength of a nation. India intends to impact the global academia by remarkable contributions in research by expanding the frontiers of human intellect. Hence, it is pivotal to develop a robust system that fosters research and innovation. In this direction, NEP-2020 has proposed the National Research Foundation to facilitate research, which will give an impetus to path-breaking research activities. A vibrant research and innovation culture across higher education institutions is of great significance. Research labs and other research organisations are the backbone for innovations in a technology driven competitive world. NRF would play a very crucial role in creating a culture of high quality research and build capacity in disciplines that are critical. There is an urgent need for a significant expansion of research capabilities and output across disciplines.

SUGGESTIONS FOR IMPLEMENTATION OF RESEARCH AND DEVELOPMENT THROUGH NRF

NRF should be legislated as the key central funding agency to govern and regulate all research activities. NRF needs to be competitively funded for all disciplines to successfully carry out research through

close linkages with government agencies as well as industry and private/philanthropic organisations in India. NRF should strive to play a major role in funds by bringing all the funding agencies onto a single platform. It should form partnerships to harness the collective intelligence of networks and the NRF should advocate an audit and ranking of research at the university level that will act as an impetus to higher educational institutes to bring about quality research. Encouragement should be given to collaborations – both national and international – through research conferences and exchange programs to enhance productive research.

It is of paramount importance that both the central and state governments allot a fixed fund for research in the budget as a regular budgetary commitment. In order for research to be given due importance and recognition, the research and innovation investment, which currently stands at 0.8 per cent of GDP, needs to be enhanced to at least 2 per cent of GDP. To attract funds, universities should secure intellectual property from their research or to actively court private industries. It should provide a competitive access to government research grants through a merit-based system to incentivise and support Research and Development. It is necessary to note that there should be role clarity between NRF and other funding agencies such as DST, DAE, ICAR, ICMR, DBT, ICHR, UGC in the allocation of funds and monitoring of research. The funding bodies should be committed to embedding quality and diversity for research in all fields.

It would be pertinent to mention that the projects funded by NRF should strictly adhere to create a national research credit bank for all those it funds, and monitor the output of their research. To foster research publications, integrated national digital library membership should be made compulsory in all HEI's by converting their libraries into digital libraries and there should be access to books, periodicals, journals, patents. This will aid in multiple subscriptions of library resources to be eliminated and thereby decrease government expenditure on library resources.

In order to maintain sustainable quality, college faculty should be encouraged to publish open access scholarly research papers with

copyright certificates from the government of India and more significantly patent submissions. As there is a dearth of research guides, services of retired professors in this direction could be beneficial, and highly qualified and proven researchers like them should head various research agencies. NRF should act as a liaison between researchers and industry, which will further aid in policy making. Students should be conducting research, based on industry internship, and publish scholarly papers and own patents during their degree education. It would be edifying to note that all universities should start their own digital publication units in order to bring out high quality research at par with global indexing agencies.

SIGNIFICANCE OF RESEARCH UNIVERSITIES

Research is a tool for building knowledge and facilitating learning. It is an essential component in generating thorough knowledge in any particular field. Research universities have the capacity to produce powerful academic structures that make it possible for nations to compete in a sophisticated, global and in-depth knowledge economy. These universities are intrinsic to the success of any contemporary, knowledge-based economy. Our research universities should be nationally and internationally recognised for the quality of its research and the breadth of its research outputs and create an environment that is entirely conducive to scholarly pursuits. The university should hone research on areas of critical importance and represent a perfect choice for international students looking to get involved in world-class research in an innovative, diverse, and welcoming environment. There should be diverse research programs that engage in a complex, global society, instilled with an awareness of issues in sustainability alongside an in-depth understanding of varied cultures and differing international perspectives. A university should be known for its ground-breaking education model, global character, and cross-disciplinary approach to its academics and research. The research university through its high-quality programs and impactful research must seek to expand knowledge through basic and applied research, serving diverse economic, cultural

and societal needs of its local, state, national and international constituencies. Research universities should overcome the trend of becoming more and more specialised, and instead try to integrate undergraduate teaching and research to create a true community of scholars. Nobel Prize winners should be associated with research universities for guidance and direction. Research Universities should attract scientists, scholars, and students from around the globe to carry out cutting-edge research and learn from leading authorities. These universities require investment in state-of-the-art facilities. Specialised research infrastructure is the key to the production of quality scientific discoveries. A Research Excellence Framework for assessing quality of research is essential. It should include all forms of research output that should be assessed on a fair and equal basis, including interdisciplinary and collaborative research.

IMPLEMENTATION PATHWAYS FOR RESEARCH INTENSIVE UNIVERSITIES

Research universities should form regional academic alliances to build enough strength in selected fields to promote participation in global science. There should be a linkage to global academic system of science and scholarship so to understand advanced scientific developments and participate selectively in them. Creation of a differentiated academic system for research universities with diverse missions, structures and patterns of funding for at least 80 per cent of competitive research funds, should be there. Universities too should take the onus for long-term financial sustainability of research through proactive diversification with enterprises including cross-border Consortia, Foundations and other private sources. At the national level, a Flagship Research University should be established for leadership in higher education. The funding and merger of research universities to provide better economies of scale that could greatly aid in the proper use of funds. Funding of research Universities must be available on a sustained basis. Social sciences and humanities should be included alongside the hard sciences; an appropriate mix of funding sources and regulated allocation mechanism would

encourage innovative research ideas. Research universities need autonomy to shape their own programs, manage their budgets as well as that of the academic community. Faculty should be highly trained, committed to research and scholarship. Local research universities need to focus on local needs by bringing international scientific trends to bear on local problems and contribute to the development of domestic industry, agriculture and society. Research universities have the responsibility to disseminate research and analysis in local languages. Research universities provide the skills needed by 21st century economies and societies and reflect the best academic values.

The role of research universities in advancing society and the economy is multi-faceted and highly important. In fact, the importance is so high, it is crucial for national leaders and decision makers to have a thorough and shared understanding of the functional benefits generated by them.

INTERNATIONALISATION OF EDUCATION ANDMEASURES FOR IMPLEMENTATION

Vishwa Guru – envisioning India as a global destination for providing premium education at affordable costs – is the right step towards internationalisation of education. The encouragement to high performing Indian universities to set up campuses abroad and enabling selected universities among the top 100 universities in the world to operate in India, is laudable. To start with, the government should ensure only non-profit institutions offering multiple programs to set up campuses in the country. Measures should be taken to establish an overall policy reform that encompasses the specific courses to be offered, exchange programs, affiliation, international scholarships, international collaboration, funding, and networking activities that are to be taken up. Steps should be taken to synchronise the Indian credit system with international credit systems to enable credit transfer between Indian and international credit systems.

DIGITAL INFRASTRUCTURE AND ADOPTION OF TECHNOLOGY

Technology is the cornerstone to democratise education and it can create powerful communities. It has played a pivotal role in enabling the shift, especially in cities and towns with high-speed internet connectivity. In the 21st century, knowledge of internet usage is a fundamental human right considered at par with reading and writing. The policy is vocal about digitalisation in education, but the challenges of disparity in between regions, population, classes, delayed infrastructure development, bandwidth availability should be addressed. The most important element that supports the use of technology in the educational system is the internet. E-learning has become one of the fastest moving trends in education and poses a promising alternative to traditional learning. Knowledge of internet usage is a fundamental aspect that should be inclusive.

The policy lays emphasis on leveraging the benefits of technology in making the youth future ready. This noble initiative will be successful only if the government works on improving the basic infrastructure that will support digital infrastructure across the country as majority of the rural institutions lack digital classrooms, remote expertise driven teaching models, and AR/VR tools that are essential to bridge the gap between physical teaching and that of practical learning in laboratories. It has been proposed that the key to the continued viability of institutions of higher education in light of increased competition in the global market place will be their adoption of learning technologies that increase flexibility, access and convenience *(Smith and Oliver, 2000)*.

Technology plays an important role in facilitating learning. It has facilitated many effective educational methodologies such as self-directed, independent, and collaborative learning. It can connect people whom, separated by schedule and location, might otherwise not be able learn from each other. And it can provide the opportunity of receiving immediate feedback assessment, making learning appear comparatively more achievable than it would without instant feedback. The strategic expansion of the higher education system to increase access to education for all social groups and geographies

through virtual classrooms becomes a reality only when, especially in rural areas, internet connectivity is easily accessible (given the fact that it is nearly non-existent), making digital learning a major challenge even after tremendous growth of ICT overall. This calls for a timely reminder to enhance the use of technology in education to achieve greater understanding by students across all disciplines.

Research has demonstrated that smartphone applications and the internet are introducing a new degree of responsiveness and flexibility within the educational process. This response is facilitated by the ease with which content can be updated, instruction can be personalised, information can be accessed, information can be distributed, and content can be standardised. *(Rosenberg, 2001 and Cradler, et. al., 2002).*

In order to realise the vision of NEP-2020, there should be experiential learning and industry-academia partnerships. In this context, blended and online learning will be crucial and hence it is important that the government should allocate appropriate funds to develop the digital infrastructure across India. Many students rely on technology for their academic needs; technology contributes to the long-term retention of knowledge and acquisition of skills such as interpersonal communication, psychomotor and cognitive skills within different courses.

We have witnessed a tremendous growth in the information and communication technologies that have revolutionised business practices and strategies of entire industries, and the field of higher education is not exception to this phenomenon. Application of information technologies in the education sector is also referred to as educational technologies.

In the upcoming budget, there should be an allocation of funds to develop digital infrastructure across the nation, especially in rural India. The Government needs to evaluate the ground situation and spend on assets for the long run that includes smart classrooms, internet connection and skill up-gradation of teachers in line with NEP-2020. Teachers would also need to adapt to the changing pedagogy and restructure their teaching methodologies. It has also

been pointed out that, by comparison, those with a high level of technology in their teaching may be better at instilling students with a desire to learn and the development of critical thinking skills. *(Ritchie and Wiburg, 1994).*

The budget should provide for setting up of research and technology upgradations and accessibility. The private sector should also fund through their own resources or through CSR on research and technology. External commercial borrowing and Foreign Direct Investment (FDI) is essential to boost quality and research.The policy needs to be loud and clear on the guidelines for increasing digital literacy.

CONCLUSION

In conclusion, NEP-2020 is truly visionary, aspirational, and comprehensive, which is all set to bring about a paradigm shift across all spheres of education. Strategic planning and a larger vision that correlates economic development to transformation in the education sector, particularly in higher education and research, will go a long way in making our nation globally competitive. The newness of the vision shall focus on the genius and capability of our people and our civilisational ethos, create the desired intellectual, economic and social value, and also prepare the road-map to achieve the vision, aligned with our excellent policy foundation. We look forward earnestly with a sense of pride and hope for its successful implementation.

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