



On the reconciliation of STEM education with HSS

Sayed Iram Tabish*, Syed Zahoor Ahmad Geelani**

School of Education, Central University of Kashmir Ganderbal

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ABSTRACT

The national educational policy (NEP) was approved by the Union Cabinet in 2020. It envisages a flexible, robust, skillful policy of Education. An inclusive approach aiming at the reconciliation of the humanities and social sciences (HSS) with modern science and technology is discussed. A new perspective is introduced within the context of STEM based curriculum for a change in teaching and learning mechanism vis-a-vis job prospectus. It is proposed to solve the large scale problems like unemployment, high magnitude of drop out ratio, e.t.c.

I. INTRODUCTION

STEM stands for science, technology, engineering, and mathematics. STEM is important because it's ubiquitous and pervasive. Science pervades everywhere around us. Technology is making a vital impact in all the aspects of our lives. Engineering deals with the design of roads, bridges, materials and challenges of utilizing it for the benefit of humanity. Mathematics is the language of almost every activity of our life.

National Education Policy (NEP 2020) was approved by the Union Cabinet of India on 29 July 2020. It envisages India's new educational system and replaces the traditional, long surviving educational policy with a holistic and skillful education system that has the potential to transform the educational system into an equitable and fair knowledge hub by providing good quality education to all. NEP 2020 has the potential to remove the educational and learning barriers and streamline the far-fetched things under a common theme/umbrella. The potential ability of this policy is to replace the parochial, screwed curriculum with the flexible, interest based choice of learning. It will jeopardize all the bottlenecks in the way of

learning. The idea of implementing this educational policy is to encourage multidisciplinary research and reconcile the Humanities and Social Sciences (HSS) with Science and Technology. World is changing fast and the research in Science and Technology has given us solutions that encompasses the wider needs of human beings. Thus, it's imperative to bring the scientific solutions into the particular regime of the social system. The progressive academicians and researchers have already embraced this idea and nuanced it to its proper setting. It will demolish the old rote learning and pave the way to a conducive and true learning system.

Modern age is relying highly on technology and it is a vital need to introduce technology based skills and tools in our teaching learning process. This usage of technology will remove the obscurities in the communication and provide access to the educational planing and management. One key aspect of this policy is that it recognizes a need to set up the Incubation and Innovation centers which will encourage the interdisciplinary research culture. It will enable to reinvent the child's interest and foster the learning mechanism. This will bring novelty in the education system and revolutionize cross-disciplinary col- laboration and help students to develop critical thinking skills and present the real world stuff for growth. The benefit to make the curriculum flexible through an interdisciplinary approach will raise the Gross Enrollment Ratio to 50 % by 2035 which is possible only when we will have technology based multidisciplinary focus on education. The STEM education will impart sound knowledge and application of different disciplines which will lead to creativity. The vacuum of the worthwhile research topics in the interface of the traditional disciplines can be covered in such a flexible scheme. STEM based education has significant



consequences vis-a-vis employability. This type of approach encourages the pragmatic spirit of knowledge and constructivism and rejects the limitations and barriers in the way of learning. It allows the promotion of student's individual aspirations and helps to develop the key market driven and transferable skills. We are currently grappling with the environmental crisis. The pollution, rise in temperature, melting of glaciers, fall in water table, disasters have posed a serious challenge to mankind. Environmental Education

STEM as a Curriculum Concept in Educational landscape

As Bruner (1961) said, the vital route to learning is to help students to identify and comprehend organized and assembled information through a coded structure which a child can develop by discovering rather than being taught. The constructivist approach to learning implies that the child develops his own understanding of the subject by meddling into it in the first place. To help generate the information, the information must be fundamentally unpacked from an underlying curriculum. The curriculum must be concrete and comprehensive. J. S. Bruner argues that the curriculum must be structured as per child's orientation, "a viewpoint in which a child can learn and explain it to himself". The curriculum must be designed in a way that would give opportunities to child so that he can discover things on his own. Discovering means exploring complex things and reducing them to the simplest form. The children's approach to learning should enable him not only to grasp a problem but ensure that he designs the solutions to other problems. It will increase the vision and comprehension. The theme of the good education is to inculcate the attitude of thinking rather than the mere learning of facts. The STEM Education is integrated curriculum chip which has an intrinsic interconnected design. The subjects integrating as a single unit (STEM) are deeply related to each other and have functional theme. Therefore, standardization of curriculum would have huge impact on its by-product.

There are two ways we can integrate the curriculum. One is broad-field design and the other is correlation design. The broad-field design encompasses the wide range of subjects. However, the correlation design is a minimalistic version of the broad field design and integrates only two subjects. The advent of technology and innovation has filled in the gap between subjects. The combination of physics with biology (Biophysics)

must be reinforced with STEM science. It will have a vital impact in our policies at the national and international level. There is a need to develop the stories in which HSS can answer the grievances of the interest to the public and authorities in policy making. This will foster a positive change and bring together the HSS and STEM community which can work in coordination to drive the economy forward and bring glory to the economy.

employs the laws of physics applied to biology. The subjects need to be introduced at the fundamental stage of educational ladder. This will encourage students to explore the possibilities beyond the current curriculum and help them to find the solution of the problems at the early stages of learning. The interdisciplinary structure of curriculum is the cornerstone of STEM Education. It will ensure the solutions to many dead end problems and bring a true faith in education. However, the ample teachers should be trained to manage a robust teaching learning of such courses in educational system at the fundamental level. The monotonous, individual research will be replaced by collaborative, cross disciplinary, and innovative research system. The major challenge in the way of integrating the subjects is the design of curriculum.

The curriculum must be designed to meet up the challenges of the current times. There should be no extermination of the language subjects, nor should be the mishmash of the subjects leading to superfluous design. The curriculum STEM blended with HSS in an organized pattern will lead to the socially valued projects which will unpack the employment opportunities. The STEM Educations will provide a wider platform and is believed to drive lot of youth to pursue their desirable courses in higher education. India has a bad record of women folks who are not willing to study when they are at the crossroads due to the availability of the fixed choice of subjects. It is believed that women are more tolerant than men and more persistent as well. STEM based Education has its implications in nanotechnology, artificial intelligence, robotics e.t.c and could involve a lot of women to pursue their dreams which otherwise were disdained due to their non involvement.

Highlights of the STEM based NEP Education

Promotion of high quality, choice based, flexible learning education. Education through



mother tongue will benefit the students to overcome the hurdles in the learning system. The confinement/ compartmentalization of the students into Arts and Science streams will be wiped out and the multidisciplinary culture will be introduced. Introduction of the Vocational education in the NEP policy will have huge impact to curb the unemployment. Earlier vocational trainers (electricians, plumbers, gardeners, carpenters) were regarded as labourers. It is now believed that the mindset of the people will change and inclusion of such skills in NEP will broaden the people's vision and such skills will gain the attention. Education through new modes of learning will inculcate the digital skills and hence will provide the opportunity to compete at the global level.

II. SUGGESTIONS/ CONCLUSIONS

The objectives as envisioned by NEP includes the universalisation of education and with a wide ambit from very early education to higher education, professional to vocational education. The benefits of following a particular subject interest of a child remains intact so that he develops a thorough knowledge from the grassroots level. The skill favouring employability will float in the market and the unemployment will be reduced to a

substantial level. The gaps in the educational curriculum will be reduced and hence with the introduction of the new educational system will work on the market driven demand and hence alleviate the miseries due to the repercussions of the current market. There should be special focus on women with regards to engaging them in the STEM based NEP so that the current gender disparity in the educational system can be culminated. The horizons of the curriculum should be extended beyond limits so that the students have the liberty to choose the subjects of their choice and a bridge between various subjects could be developed to tackle the seemingly invincible problems.

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