

A Weekly Journal of Higher Education

### **Association of Indian Universities**

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# Bringing Home the Inseparable Intimacy between Physics and Mathematics through Experiments

Chinmoy Kumar Ghosh\*, Subhash Chandra Samanta\*\*
and Pradipta Panchadhyayee\*\*\*

An exercise was undertaken by the IAPT Centre for Scientific Culture, Midnapore College under the aegis of the Education for All (EFA) program of Nanritam's Filix School of Education (NFSE) in a remote hamlet, called Para, in the district of Purulia of West Bengal. The objective of the exercise was two-fold: To internalize the role of experiential learning through hands-on practice in physics experiments and that of perceiving mathematics as giving shape to physics, thereby establishing mathematics as the queen of physics outgrowing its common identity of merely being the language of physics. The exercise consisted of conducting three back-to-back workshops involving the teachers and marginalized students of as many as ten remotely located schools (hosted by NFSE). The unique feature of the exercise lay in its departure from the normal trend of winding up after holding one training workshop with one group and not generally caring for its effectiveness as applied to the end-users that is the students.

The paper is based primarily on the feedback received from the teachers and students who attended the workshop, which, though not indicative of any runaway success, gives the impetus to replicate the exercise at other institutions and aim at higher objectives.

Learning science is incomplete without performing hands-on experiments. During the so-called COVID period, some learners got exposed to virtual laboratories, but these were good for demonstration; they could not bring in the fun of experiential learning which happens in a physical laboratory. Further, very few students got such an exposure. As a matter of fact, the performance of practicals, which is so essential for laboratory-based subjects, physics being the prime among them, has unfortunately lost its relative importance in the curriculum. On the other hand, it is ironic that the students keep getting very high marks on the practical examination since the arrangement for such a test is all managed internally — it is a well-known fact and anything happening in the contrary attracts the wrath of the students and their guardians. We become victims of circumstances, where we end up making the meek surrender of our moral and ethical values which are deeply impregnated in the virtue

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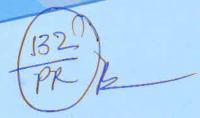
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# Significance of the Institutional Education Department Recommended in the National Education Policy-2020

Dhanappa M Metri\*

National Education Policy-2020 has a very relevant concept of 'School of Education' at the universities and 'Education Department' at the colleges. According to the 'Draft Guidelines for Transforming Higher Education Institutions into Multidisciplinary Institutions', it is limited to Multidisciplinary colleges for the present. However, it will be at all colleges in the future. A very sensible recommendation! The author is of the opinion that all institutes should have a robust Education Department to play a major multidisciplinary role in attaining institutional Academic Excellence. In the previous Self Study Report by the NAAC, there used to be a question about the availability of Integrated B Ed program in the institution. The author has experience of not getting a satisfactory justifying response with the logic behind it by the Resource Persons in different academic meets, After going through the NEP- 2020 and the Guidelines he realized the significance of such a department in the institution to implement the policies and enhance the outcomes.

The author also remembered his previous publication in this journal stating the significance of Quality Domain Experts in the institution for quality enhancement. (Dhanappa 2012) expresses his displeasure over the institutes heavily depending on the routine, and limited academic experts in the accreditation process which is changing the very functioning of the education system. The Accreditation procedure demands the complete overhauling of the system and quality so the concepts should be crystal clear to all the stakeholders. He recommends institutes to have the presence of quality domain experts to implement the quality majors effectively. Then he explains the concept of quality domain experts who are the experts in quality education. He exemplifies the quality assessors as the domain experts who can examine the successful functioning of the academic institutes. He further stresses that the quality domain expert should be a born teacher who always thinks of the successful learning experience with expertise in educational Philosophy, Child Psychology, and Social relevance of education.

While explaining its need he thinks that meeting the expectations of the knowledge era is possible only through quality education. He further gives the ways to cultivate the institutional quality domain experts; selection of teachers with passion and aptitude for the teaching career, creating quality awareness among the stakeholders, organizing academic meets on quality education, participant -experience sharing

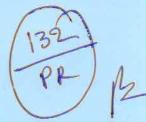
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### Mind, Body, and Artificial Intelligence

M S Kurhade\*

"Seek ye first the good things of the mind, and the rest will either be supplied or its loss will not be felt".

Francis Bacon.

Protagoras's doctrine is that "Man is the measure of all things, of things that are, that they are, and of things that are not that they are not". It is evident that external objects, by affecting our senses, cause in our minds several ideas which were not there before. So, we find the idea of beauty, truth, goodness, red, and sweet as an impact of sensation. The mind, taking notice of its own operation about these ideas received by sensation, comes to have ideas of those very operations that pass within itself- this is known as reflection. Therefore, John Locke in his famous book "An Essay Concerning Human Understanding" (1689), says "Whatsoever the mind perceives in itself, or is the immediate object of perception, thought or understanding, that I call 'idea'. Notice the word 'Immediate': In sense perception, we immediately perceive our own ideas, and through immediately or indirectly- we perceive outer things". Here, the main issue is whether our 'knowledge', and 'idea' are based on our experiences or inborn/ innate. The power to form certain ideas is indeed innate. The fact is that all human beings, despite their differences in different spheres of life, can more or less communicate among themselves, which strongly suggests that they have the necessary capacity within them. In that sense, all knowledge, or at least the capacity of knowledge, is innate to humans. This is the basis of humanist philosophy. As we step out of that territory-which has been our comfort zone for centuriesinto a new terrain where we have to grapple with the possibility of machines becoming intelligent, are we entering what philosophers are calling the "posthuman age"?

The article aims primarily to provide conceptual understanding and an exposition of the mind, body, and humanoid perception and the underlying assumptions of the logical and mathematical systems. The present century can appreciate a man whose motto is "Clever BOT GO BY PATTERNS", and who expresses his sense of the dynamic in such maxims as "Brain in the Machine". Our scientists, logicians, mathematicians, philosophers, and technologists are still working to achieve their dream of being the master. The knowledge of 'symbols' and 'numbers' to standardize mathematical operations and orderly procedures of statistical techniques helped to develop the calculations for perfect applications of a conception and idea. The rapid advance of science and technology is helping to reveal the

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# Dipole and Academic Club Models to Improve Quality of Education

R Jaishanker\*

This article is written against the backdrop of recent reports of an alarming increase in the number of students from Kerala moving to foreign universities for higher education. While the trend will be similar for all states of India, Kerala has crossed the threshold, leading to campus rarefaction in institutions of higher learning in the state. Campus rarefaction refers to the condition when seats in institutions of higher learning remain vacant due to student migration. This posits an interesting case study.

During the closing decades of the twentieth century, transnational student migration was modest<sup>1</sup>. It was mostly an urban phenomenon limited to doctoral and postdoctoral researchers. The opening decade of the current century saw an increase in students migrating for higher education<sup>2</sup>. Over the last decade, there has been a considerable increase in students leaving Kerala for higher studies sans scholarships. Masters and Undergraduate levels are flagged as 'new segments of growth aspiration' in the global educational scenario<sup>3</sup>.

The adage: quality attracts quality applies to educational institutions also. The pursuit

Campus rarefaction should be seen as an opportunity, not otherwise.

of quality offshore education is an option very high on the cards of an increasing number of students who aspire for admission to elite academic institutions in India. The slack in the pace of expansion of quality educational institutions in India, coupled with the rise of the new middle class and soaring aspirations, are the more proximate causes of student migration<sup>4,5</sup>. The author presents two integrative pathways that rely on consolidating the existing strength to enhance the quality of education and thereby stem campus rarefaction.

The annual global higher education market was valued at USD 736.80 billion in 20236 Higher and tertiary education is a commodity in an increasingly competitive, corporatised world. Beyond the physical space of universities, the education market supports a chain of entrepreneurs across the developing world. Universities and entrepreneurs have successfully crafted a symbiotic niche sector in student recruitment. It is interesting to note that universities are now categorised as higher education companies6. The niche sector effectively leverages social media to highlight laboratories in *client universities* and project professional success stories. Students will more likely have heard of professors in universities in the developed world but would not be aware of professors in their backyard.

Campus rarefication reported from higher education institutions in Kerala indicates the marketing success of the education service sector. It is important to note that the issue first surfaced as a social concern in a society known for its historic willingness to migrate

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