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A PATH FOR HORIZING YOUR INNOVATIVE WORK

KNOWLEDGE CENTERS AS LABORATORIES FOR RESEARCH IN EDUCATION

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Abstract: Changing times have brought new perceptions of knowledge and education. The limitations of our rigid education structures in preparing students for today's knowledge based world are often discussed and debated but seldom reach win-win solutions. Recently we took a proactive initiative to address this concern by starting a physics knowledge center in our institute to develop a knowledge based approach among students. We discuss here our encouraging experience of how a knowledge center can work as a laboratory for research in education towards ensuring enjoyment, employment, empowerment and enlightenment of learners. It is further discussed how such centers can promise knowledge reforms in our education and optimize the role of knowledge as a natural enabler for human development in India.

Keywords: Research, Education, Knowledge Centers, Education System, Human Development, Knowledge Society

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INTRODUCTION

Changing times have brought new perceptions of knowledge and education. Developments in recent past such as Vision 2020 of Dr APJ Kalam and the establishment of the Knowledge Commission have generated lot of interest among the thinkers and planners of India to delve deeper into issues related to knowledge based education. Despite of an impressive expansion of higher education in India there is much to be desired when we talk of excellence. Several workers have expressed the need for knowledge based alternative approaches to our current education structures for quickening our march towards a knowledge society.^[1-5]

Motivated by these concerns and by our recent work along these lines^[6-9] we took a proactive initiative recently by starting a physics knowledge center (PKC) in our institute.^[10-11] The initiative is based on the premise that knowledge is a combined result of ignorance and curiosity, i.e., what one doesn't know and wants to know. The role of knowledge as a natural enabler can be optimized if our structures facilitate and maintain the harmony of natural learning. We call these structures as knowledge centers to distinguish them from the education centers in which the learning process is constrained in formal structures.

MATERIALS AND METHODS

The PKC initiative is used as a laboratory that undertakes research in physics education to achieve the fourfold objective of enjoyment, employment, empowerment and enlightenment of learners. This is a fresh, distinct component, different from the two well known components of our field, viz. teaching and research. Whereas teaching in our education centers aims at covering the syllabi and learning for exams, knowledge center aims at uncovering and discovering the syllabi and learning for knowledge. Whereas research in education centers generally pertains to career goals of faculty and is mostly an activity by the experts for the experts, research in PKC pertains to the knowledge and career goals of students and is an activity by the faculty for the students. In the following we discuss the materials and methods used in this laboratory to accomplish the fourfold objective mentioned above.

Knowledge for Enjoyment and Enlightenment

By the intrinsic virtue of its very nature, pursuits in learning physics involve the joy of understanding nature and the thrill and excitement of exploring nature. Moreover the truthful pursuit of knowledge promises wisdom building and enlightenment. However, our present education structures miss this spirit.

In the PKC we made an attempt to facilitate building this spirit by allowing the freedom and flexibility of knowledge accumulation as per the needs, propensities and curiosities of learners.

Addressing these objectives, we developed learning material in the form of stories, observations in nature, concepts as refinement of everyday thinking, learning links, interesting problems and research motivations.^[12] We also started activities called *knowledge clinic* and *curiosity corner* for this purpose.

In knowledge clinic students were encouraged to get their doubts and misconceptions clarified through interaction with experts with a view to improve their understanding of the subject. This activity promoted the spirit of accommodation and inclusion as the natural ignorance of every learner is different even though all learners study together as a requirement of education center.

The activity enabled students to uncover the syllabi in a sense that they got an opportunity to get their knowledge prerequisites fulfilled on which the knowledge in the present syllabi is based. The questions ranged from basic understanding of Archimedes principle to solving complex integrations required in the derivations in the present syllabi.

In curiosity corner students were given the freedom and opportunity to ask queries that aroused their natural curiosity. Interactive sessions with experts were held to satisfy these queries. The activity facilitated students to discover the syllabi in a sense that they got an opportunity to get the knowledge of their present syllabi linked to the deeper and broader world of knowledge. This activity brought out the curious best of the students in the form of question ranging from substructure of electron to measuring diameter of stars.

Knowledge for Employment and Empowerment

The courses in our present system are devoid of 'employable knowledge'. As a result education seldom matches job requirements and large numbers of graduates remain unemployed. After completion of UG/PG courses students 'search' for jobs often coming to terms with the harsh reality that what they were 'taught' has little relevance to industry/job market. Moreover, the potential of knowledge as a power in today's world is not convincingly brought to fore in our education structures.

In PKC the objectives of employment and empowerment are addressed by bringing to fore the obscured links of curricular knowledge with the vast world of applications. An activity called *knowledge café* was started for this purpose in which the application oriented interests of students were aroused and served. The discussions under this activity had a wide range that

included various applications of lasers, optical fibers and interferometers in industry. These discussions also triggered motivations like knowing how we can build our own laser. The activity also developed awareness about the social impact of knowledge through events such as celebration of the 50th anniversary of discovery of laser by USA in 2010 and the global celebration of current year as the international year of crystallography.

Knowledge Reforms in Education

From about 20 universities and 500 colleges at independence to over 550 universities and 30000 colleges at present^[13], India has gone a long way and stands today as a nation with the largest number of higher education institutions in the world. Despite this impressive expansion it can accommodate only about 10 % (2004-05) of our youth eligible for higher education at present. Moreover, knowledge, which is the main aim of education, seems to have almost gone out of the focus of our rigid education system.^[1-5]

Sam Pitroda, Chairman National Knowledge Commission, recommended creation of 1500 universities to attain a gross enrollment ratio of at least 15 % by 2015 and of 50 national universities to provide education of the highest standard.^[14] However, with 'islands of excellence' and majority wallowing in mediocrity in our higher education structures,^[5] these recommendations may prove to be unproductive in achieving the envisaged expansion and upgradation, if we continue only with the present system. The model proposed by us promise to remedy the ills plaguing our system by making it knowledge oriented, knowledge centric and knowledge intensive.

RESULTS AND DISCUSSION

The PKC initiative discussed in this paper has produced encouraging results. It exposed students to the deeper and broader world of knowledge and helped to convince that knowledge is not just for marks and degree but also for power, prestige and wisdom.

Teaching and research are often debated as independent in our present structures because teaching is student centric and research is expert centric. However, our initiative has helped blur this distinction by shifting the emphasis to 'research in education'.

Such knowledge centers promise to blur the traditional boundaries between education and other sectors and can acknowledge and embrace the rich variety of knowledge that is available with our surrounding (natural knowledge) and our people (indigenous knowledge) and optimize the role of knowledge as a natural enabler for human development in India and quicken her march towards a knowledge society.

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