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A PILOT SURVEY ON IMPACT OF ENTHREPRUNERSHIP IN ACCELERATING INNOVATIONS WITH RESPECT TO DEVELOPMENT OF SCIENTIFIC INSTRUMENTS ON EDUCATION IN INDIA

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Abstract— The present paper is an attempt to focus on the entrepreneurship in accelerating innovations with respect to development of Scientific Instruments on education in India. How the technological change is being reciprocated by the school and college teachers and is being implemented in the curriculum of various universities. How many school and college students and teachers are aware of the latest launched and innovative technology based science equipments . Are they still using the old conventional and traditional mode of scientific instruments in their schools or colleges in India? This phenomenon is mainly confined to India. And it has been found that only 30 percent of teachers and students are aware of the globalization of innovations.

Keywords—Entrepreneurship, Innovations, Scientific Instruments, Education, India

I. INTRODUCTION

Transformation of ideas into innovations is a global need in support of boom in educational status of our country. Indian people are considered to be second most intelligent and hard working among all countries. The scientists and researchers all over the world , are transcribing their ideas at a fast pace , into innovations, developing very innovative, latest technology based scientific equipments, which are very commonly used in schools and colleges of varied Universities and Institutions in our Country. Such instruments are very distinguished from the old traditional, conventional kind of instrument which are based on different technology and are comparatively difficult for the students and teachers to use. They are time consuming. They need to be standardized every time we use. Say for example,PHmeters,Calorimeters,Spectrophotometers,microto mes ,etc. In today's era ,most of such instruments have been assembled very innovatively, in handy/pocket sizes with very easy technology and fast result oriented. These accelerating innovations are joining hands with the industries to transform University research into technologies that can assist numerous companies developing new products and processes. University researchers are currently working with industry partners and government sponsors to implement new technology innovations in the field of Science/life Sciences, Medical fielded. There is a realization that, "to sustain rapid growth and alleviate poverty, India needs to aggressively harness its innovative potential, relying on innovation-led, rapid, and inclusive growth to achieve economic and social transformation" (Dutz, 2007). The innovative potential of the young Indian population, if supported through an effective innovation ecosystem, holds potential for developing entrepreneurship and providing the growth and job opportunities that India needs. The current national innovation system in India is a vast and complex system comprised of knowledge producers such as science and technology institutions, academia, and innovating individuals and knowledge users (e.g., industry-production/services in the public and private sectors). Various governments in India have given priority to science, technology, and innovation, and therefore India has evolved a large publicly funded R&D structure. There are various councils and research structures under various ministries, which cater to different research areas and which are distributed around the country. Examples include: Council of Scientific and Industrial Research (CSIR): established in 1941; 39 laboratories, Indian Council of Agricultural Research (ICAR): established in 1929; 99

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institutes and 17 research centers Indian Council of Medical Research (ICMR): established in 1911; 30 laboratories .Defense: established in 1958; 48 laboratories. There are many other publicly funded institutions that perform research and technology development for industries related to steel, oil and natural gas, renewable energy, coal, textiles, railways, road transport, electronics and communication, environment and forests, irrigation, and so on. There are also more than 1200 privately or state-funded Scientific and Industrial Research Organizations (SIROs).

In India, the innovation ecosystem includes individual innovators and entrepreneurs; mentors; government policies; angel, venture capital, institutional, and industrial funding mechanisms, intellectual property rights mechanisms; technology transfer mechanisms; market inputs; and incentives, awards, and other innovation-recognition mechanisms, among others. Ideally, these various structures and mechanisms facilitate the smooth translation of innovations through the various segments of a complex innovation chain that takes ideas from "mind to market".Thus, the functional goal of the innovation ecosystem is to enable technology development and innovation. But, how well is India's innovation ecosystem performing today? According to the Global Innovation Index (WIPO, 2014), India ranks 76th among the 143 countries surveyed, India is a country with over 1.2 billion people, 379 million (31%) of which are between the ages of 18 and 35 (Census of India, 2011). And, many of these young people are in search of jobs, despite being educated. For example, only one in every four urban males under 29 years is employed even though they hold at least a certificate or diploma (National Sample Survey Office, 2013). The aim of the government has been to create employment opportunities for youth while focusing on rapid economic growth. Entrepreneurship development is one of the mechanisms adopted by the Government of India towards the creation of job opportunities. The government's assumption is that support for innovation will enhance entrepreneurship development, which will in turn accelerate economic growth.

II. OBJECTIVES

1) Pilot survey of innovations in the field of scientific instruments in todays era

2)Survey of Old Conventional and latest technology based instruments used in 20 different schools and Colleges.

3)Filling the questionnaire by research students and science teachers regarding the type of instruments used in the laboratories and awareness about the latest technology based scientific equipments available .

4) Economic, easy to handle, good technology based instruments compared for their cost on internet.

5) Time consumption in performing practicals with both conventional and new technology based instruments were recorded(by asking questions) .

6) questions were asked to students whether they can handle the conventional equipments easily and is it easy to learn with those equipments as compared to new instruments.

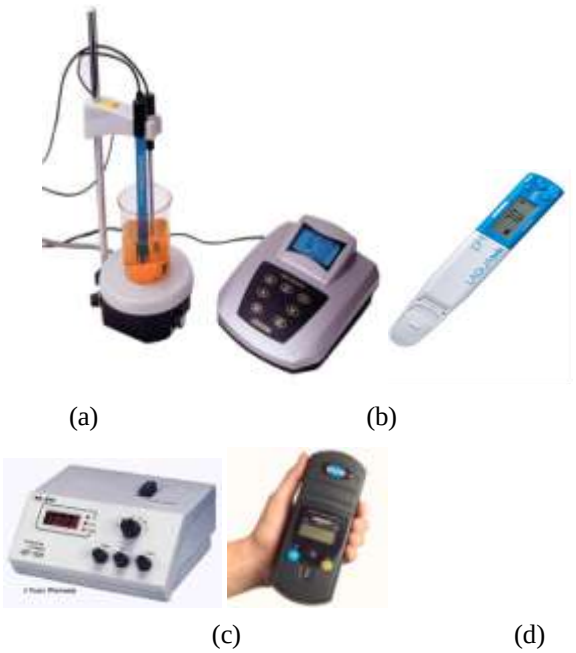
7) Questions were asked to teachers whether they feel old technology based instruments are easier to teach and handle or new technology is easier to teach and learning of students i.e., what is the impact of innovations on teaching and learning in Indian schools and colleges.

III. METHODOLOGY

The survey was purely based on questionnaire and interview of students, researchers and teachers of different colleges, schools or organizations and data was collected and analyzed.

IV. EXPERIMENT AND RESULT

We began our research by looking for innovations with respect to scientific equipments and survey of the accelerating entrepreneurship occurring in India.. This could be feasible only through qualitative research design, using questionnaire, and taking interviews of students, teachers and researchers of different schools and colleges of Udaipur, Jodhpur, Pali, Falna, Jaipur, Navi Mumbai and Mumbai., India. Inspite of accelerating innovations globally, the students and teachers are lacking in the awareness of technology and new technology based innovative



(a) (b)

(c) (d)

Fig. 4. (a) Traditional Ph Meter(b) Pen shaped hand held PH meter (c) Conventionolorimeter C (d) Pocket innovative colorimeter

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(a) (b)

(c) (d)

Fig. 5. (a) Conventional Spectrophotometer (b) Hand Held pocket spectrophotometer(c) Traditional gas detector (d) Handy gas detector

(a) (b)

Fig. 6. (a) Traditional Microtome for section cutting(b) Handheld microtome with easy technology(c) Old college lab withconventional instruments. (D) Innovative labs of todays era.

TABLE-1

Interviewed	% Awareness about innovations in Science equipments	Opinion by people that Innovations will be better in raising the levels of learning and teaching .
Students of 11th Std	25%	60%
Students of XII Std	25%	70%
BSc Students	40%	80%
Msc Students	40%	85%
Researcher Students/teachers	45%	90%

V. CONCLUSION

Together, these indicators suggest that, in spite of a large national innovation system, the current performance of the Indian innovation ecosystem appears weak. One may speculate that the reasons for this poor performance may be related to fragmentation and a lack of focus: the legacies and mindsets of the pre-economic liberalization era are still being carried forward by some of its constituent stakeholders. At least, this speculation finds support in the government's attempts to address many of these challenges in its recent policy on innovation (Ministry of Science and Technology, 2013). The policy initiatives undertaken by the Government of India to improve the innovation ecosystem . India has a large, demographically diverse population, with many young people seeking employment. The country is on a path to growth, but the rate of growth has been slow. The government has realized the roots of the basic problems and made appropriate reforms, mainly in the areas of administration, economy, and labour, as it tries to free itself from negative aspects of its colonial legacy. There has been a substantial thrust toward science, technology, and innovation in past 20 years, and many initiatives have been undertaken in that direction. However, the investments in science, technology, and innovation are not yet translating into the desired reality. Realizing that the

innovation-led entrepreneurship development holds promise for growth, the government has taken major policy initiatives with a strong innovation agenda.

There are formidable challenges in realizing the goal the main initiatives are provision of funds and removing the sluggishness in the ecosystem for innovations by improving linkages and making it vibrant in a comprehensive way. The policy is in place; now, its success depends on its implementation. Accelerating entrepreneurship can definitely develop University innovations into high level education system in India. This in turn will definitely have an impact on economic and community development. There is need of more and more industry focused applied research to create entrepreneurship curriculum , technology transfer initiatives that can connect university ideas with global needs

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