

Guest Editorial

Research and Innovation: Essential Components for Economic Prosperity

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The total number of global mobile phone users in 2019 will reach 4.68 billion compared to 750 million users in year 2000 and this is believed to surpass the number of people in the world in the near future. Over 2.6 million airline passengers take flight with 43,000 airplanes having complex airspace systems compared to 1.8 million airline passengers in 2009. These are just examples of how the scale of things is being changed with time and its impact on social and business life over a period. During the next twenty years there will be more exponential changes in social life and on the economy than in the previous twenty years. If we look back carefully, we can see that this revolution is due to a blend of chemistry and physics through engineering. Therefore, the prime need for a better life can be directly correlated to research and innovation. The health of people has been improved tremendously by having countless new drugs and health products. New and improved transport and digital services offer many more comfortable life style options creating new jobs and bringing economic growth in addition to creating an informed society. Therefore, economic growth and standard of living of a country are well connected. Power of innovation is a determining factor for a country's economic growth.

Research and innovation should go hand-in-hand; research is an essential factor to guide numerous ideas into innovations. At the same time, one cannot deny the importance of pure or basic research, because all good innovations arise by assembling pieces of knowledge gained through such research work. Creating a society to inculcate more innovative ideas is of paramount importance for a country's economic growth. Therefore, the foundation for innovations should come from the kindergarten. The children should be allowed to raise questions by observing their surroundings, rather than keeping children indoor and feeding them with theories. According to research, students who score lower in intelligence tests, end up doing better in exams because they compensate their lack of inborn intelligence with hard work. However, it is very important to inculcate creativity within a child because this is a unique human quality that will set future graduates apart from the

ever growing artificial intelligence. In order to focus on stimulating creativity, it is important to integrate science, technology, engineering and mathematics (STEM) into their curriculum. It is very important to design a thinking component in the curriculum in order to develop students' ability to think by themselves and brain storm ideas to be implemented. Introduction of project-based learning will be one such path for building innovative ideas. The consequence of this will definitely lead to already well-trained students to undertake challenging research in future. Currently, more research funds are available for applied research rather than fundamental research due to various reasonable reasons. When it comes to applied research it is very important to understand the research problem that you are trying to solve and also it should be relevant to a considerable percentage of the society. The research ideas are usually connected to many unsolved issues in the world and many more can be gathered by having frequent discussions with the industrial sector. On the other hand, many problems seen in society or in industries cannot be solved by sticking to one discipline and as a result many successful stories on innovations are the product of interdisciplinary research. Definition of interdisciplinary research can be quoted as "Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice." The other significance of interdisciplinary research is that the teamwork among many disciplines ensures the exchange of experiences and development of knowledge between various parties and accumulation of more and more innovative ideas. This will provide a platform for each and every scientist to enter the research paradigm. The best innovations are yet to happen and it can be from anywhere in the world. The technologies such as Artificial Intelligence, Robotics, Biotechnology, Nanotechnology and Internet of Things (IOT) will shape up the planet in the next two decades and therefore it is paramount to understand this trend and implement policies to adopt various techniques to inculcate innovative minds in our school children and in university graduates.