

Biotechnology and it's Potentials and Challenges

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Received: July 26, 2016; **Published:** August 25, 2016

Abstract

With the emergence and progress in area of biotechnology, the developing countries put efforts to update their teaching content and methodology keeping in view the future requirements. Situation is very different in developing countries.

Many countries revised their education policy but many of them end up merely with new modification in the content of the course outline though keeping the overall level of standard the same for a given degree programme. Generally, what many of them used to take four years to teach, now they require six years to do the same and yet their graduate stay lagged behind the international standards. This gap has been increasing day by day. Many graduate passing out each year but their employability stays doubtful. If our educational system were reviewed keeping in view the guideline consistent with that of international standard for quality education for a given degree, Pakistan would have become the hub of education and our graduates were taken up by world class organizations on handsome salaries. This piece of work is presented to identify certain aspects of problems and the hindrances related education on biotechnology that has not yet been discussed. In the end recommendations are given to present a approach required to build for long term planning to help the developing countries to build their human resource pool on biotechnology.

Keywords: *Biotechnology; Methodology; Education; Law; Poverty; Agriculture*

Problem

Since people do not have exposure of studying in world class institute, they are unable to question what is being done on the name of educational reforms. In my opinion without the involvement world class experts, developing the infrastructures of academic institutes, having world class trained professional and introducing the culture of reviewing and validating the given system no change can be brought through increasing the GDP for education though it would definitely help but is not the complete solution.

Once we manage to develop right policy for education, we can see drastic progress and sustainable prosperity with improved law and order situation within very short span of time but we need to wait for several decades to enjoy the investment in area of biotechnology. The understanding on biotechnology needs to be built up right from schooling. Whereas existing system of schooling in most of the developing countries cannot afford to give basic education on biotechnology partly for being deficient in pre requisites and trained human resources whereas partly because of the myths and reluctance from the people.

Unlike other disciplines, updating the course structure for graduation or post-graduation level in biotechnology allied fields alone cannot change the existing situation. Biotechnology is not a subject but a discipline or array of subjects using technology as a tool to alter

or altogether modify certain characteristic or a feature of any living entity. Since it is a deliberate interference with the natural processes in any living thing it can risk the wellbeing of living and upcoming populations including the human beings if the products are developed without following the safety guidelines and are consumed or are applied without the due caution. It is equally an undeniable truth that within the appropriate use of biotechnology lies the solution of all type of illnesses and poverty.

In developing countries there are a few small research groups who are using biotechnology as a tool to address issues particularly in area of health and agriculture and the outcome are a few good quality international publications. Non availability of resources and the policies regarding the growth in the career.

Most of them have not yet succeeded to give an applicable biotechnologically derived solution of our indigenous problems in area of environment, health sciences or agriculture.

Intelligent thinking using biotechnology as tool needs lifelong nurturing of ideas in this area whereas the youth have new ideas about computers and mobile technology or Information Technology (IT) generally but very few people are aware of real potentials of use biotechnology.

How would they know about it? The topic is not dealt in considerable details in the course outline up till post-graduation courses of many allied disciplines. Even in case where the syllabus has been updated teachers teaching in schools need to attend refreshing courses to acquire expertise to teach students to think something new using biotechnology as tool. There is scarcity of good standard textbooks that deal biotechnology with adequate knowledge. No one can expect to have ones until and unless our world class experts are not accredited adequately for writing textbooks that can attract international publishers. The imported books are very expensive and we do not have adequate number of public libraries either. As far as higher education is concerned, researchers in these countries are working in a very narrow area whereas we need world class researchers in all allied fields of sub disciplines of Biotechnology with conducive working environment and ample facilities with promising career prospects preferably independent of rat of number of publications but dependent on quality research based on out of box thinking. It's probably due to absence of institutional structures that world class experts fail to work in most of the academic institutes and experts trained in our system find no way out.

It's very unfortunate that even at post graduate level we do not have ample number of world class trained experts to teach this subject whereas doing experiment on individual basis is often not possible due to high cost involved.

It would be unjustified to expect that public knows about the potentials of this field.

There is a reluctance in general public to accommodate the products obtained by use of biotechnology e.g. Genetically Modified (GM) Crops and Genetically Modified Organism (GMO) derived products including the vaccines and many supplements mainly because of myths associated with their use. The other issue is the religious concerns. Religious scholars have key role to play to resolve the ethnic issues of religious concern. We as a community from developing world needs to get mature to decide our options for the use of biotechnological potentials.

Recommendations

There is a need use media to create public awareness about the merits and demerits of this latest technology to protect our people for being punished for their ignorance e.g. by protecting them from the un-notified use of any of such product without their permission.

The education system right from the primary classes needs to be revised keeping a slot of biotechnological concept building whereas the whole newly develop system needs to operate on understanding. Since the biotechnology is not simply a field but a wide domain that

is built with the enrolment of almost all subjects, it's the concept and integration of allied subject that is required to build the pre requisite for future training in biotechnology. The publicity of biotechnological success stories needs to publicize to create fascination in parallel to Information Technology success stories. The discussions inviting the religious scholar, policy makers and people from all stake of society needs to be arranged to build a general acceptance for this newly arising field. Media can play a key role in achieving this target.

There is a need of Independent Organization operating at international level comprising of expert of unquestionable professional honesty to look after the health safety and legal issues related to biotechnologically tailored products or their derivatives. They need to have authority to access whether study published anywhere has met the standard criteria and ethic of doing research.

If we had public awareness on the use of GM Crop and Independent Organization to look after the concerned issues as mentioned earlier, it would have never been possible for anyone get approval for field trial in any developing country for few GM crops that do not qualify the international criteria of safety as there has been certain incidences that were reported.

Global Risk

We as a community of scientists need to realize, in this era, when the world has global village as anyone can travel all around it, can have food or medicine of any origin, our compromise on standards can risk the existing and upcoming global community.

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Volume 3 Issue 4 August 2016

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