Sigma Teknika, Vol.3, No.1 : 82-86
Juni 2020
E-ISSN 2599-0616
P ISSN 2614-5979

CHALLENGE IN TECHNOLOGICAL INNOVATION

ArifRahman Hakim[1)]
[1)] TeknikMesin, FakultasTeknik, Universitas Riau Kepulauan
E-mail: arhakim88@yahoo.com[1)]

ABSTRACT

This article describes about the study based on document literature and documents review about the challenge facing in technological innovation. The writer has reviewed some reports and literarture relevance to this subject of the study. It is revealed that the challenge in technological innovation is to motivate youth to be interesting in study of Science, Technology, Engineering and Mathmatics (STEM). While the government is required to support the technology development in term of policy, financial and regulatory.

Keyword : Technology, Innovation, Challenge, STEM.

1. INTRODUCTION

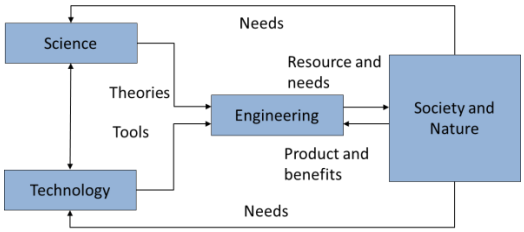
The combination of massive increases in computing power, the emergence of global digital network, and growing population in few region are conflated with an account of inevitability and market economics to produce social and technological change. We have to face globally competitive world, to adapt to high-tech, or risk economic and social oblivion. In this matter, education's role is to orientate itself and its learners as rapidly as possible, to adapt to this condition.

When technologies are released, they are adoptef and appropriated within existing social values, structures and expectations; they are shaped and reshaped by early adopters and marketers; and they come to mean different things and be used for different purposes by different people. Different social, religious and cultural values, for example, patterntheuptake of medical technologies such as in-vitro fertilization, leading to very different reproductive practices in different countries. At more local level, domestic technologies are appropriated into the existing values and cultures of families. Computers, for instant, may be resisted by some, seen as children's technology by others, or come to form the hub of family life by others. The impact of technologies is neither predetermined by their designer nor universal. People needs and desire is a key driven of science and technology development and innovation.

2. LITERATURE REVIEW

The history of engineering in the context of the way we live, and interact with nature and each other is very much the history and pre-history of humanity itself. Human being are partly defined as tool designers and users, and the innovation and the design and use of tools that accounts for so much of the direction and pace of change of history. Most of the broader history of civilization, of economic and social relations, is also the history of engineering, engineering application and innovation [4]. The stone age, bronze age, iron age, steam age and information age all relate to engineering and innovation shaping our interaction with the world. The stones age did not end because we ran out of stones.

Sigma Teknika, Vol.3, No.1 : 82-86
Juni 2020
E-ISSN 2599-0616
P ISSN 2614-5979



(Sources : UNESCO report; Engineering: Issues, Chanllenges and Opportunity for Development, 2010)

The pyramids, Borobudur, El Mirador, the civilizations linked to metal smelting at Zimbabwe and water engineering at Angkor, the medieval cathedrals and industrial revolution are all testament to the engineering skills of past generations [5]. Engineering is also vital in the surveying and conservation of our cultural heritage.

Technologies are developed rapidly year by year. New invention and trechnology innovation are created in short time. Over the years, technologies innovation and developments are tremendously occurs. Technologies support the development of industry. Nowdays, the world is in era of Industrial Revolution 4.0 It is indicated by the automotion, internet of thing, big data, 3D printing, etc.

3. METHODOLOGY

This study is conducted by methodology of literature and documents reviews.

4. RESULT AND DISCUSSION

4.1. Challenge for Science an Technolgy Development and Innovation

Although the technology and science development are significantly dominates our way of live, the interest and desre of young people to study in the field relates to science and technology is not high as what we have few decades ago. In our country, the interest of student to choice subject of Science, Technology, Engineering and Mathematic (STEM) is not high [1]. We need our government to enhance and drive science and technology development. Policy, Financial support and seriousness of government is really required. We can learn from other countries that shows their focus and strategy in this matter.

In a study done by Caroline Kearne in 2015 on Effort To Increase Students' Interest In Pursuing Science, Technology, Engineering And Mathematics Studies And Careers National Measures taken by 30 countrries. It revealed that around 80% of the 30 countries surveyed describe STEM education as currently a priority area at national level, at least to some degree. Promoting inquiry-based learning still remains the most highly ranked issue with 80% of all countries stating it is addressed as a top priority or important issue at national level. Most of countries are prioritizing STEM curriculum reform at either primary or secondary level. This is often linked to incorporating inquiry-based methods and teaching socio-economic aspects of science. Around 70% of countries are prioritizing initiatives related to the integration of the effective use of ICT in STEM education. While about 60% are focusing on the development of new or revised STEM teaching and/or learning resources, often to accompany anrw curriculum. About 50% of countries are also investing in improving initial and/or in-service STEM teacher training. In addition to global strategies dealing with STEM education more holistically (due to covering more than one STEM area), 20% of countries have specific strategies dealing with improving the profile, quality and interest in technology studies and careers in particular [2].

Research and innovation are particularly difficult to govern because they create novelty and surprise. The implementation of technology into society is a complex, open-ended and unpredictable process. The full eextent of risk and side effects can only be known by experience; and by that time they may be irreversible due to their magnitude or their entrenchment into societal infrastructure or human culture. Political and regulatory action accordingly has to include an element of anticipation, acting upon sociotechnical imaginaries, that is, narrative that imagine the future of science, technology and society and their interactions [5].

Sociotechnical imaginaries have real influence on research practice and policy, and

Sigma Teknika, Vol.3, No.1 : 82-86
Juni 2020
E-ISSN 2599-0616
P ISSN 2614-5979

they can be an object of governance. The production of sociotechnical imaginaries has been dominated by scientists, innovator and inventors. Lately, however, many European government, the USA as well as the European Union devote more effort into soft governance to democratize the processes of agenda setting for research and innovation [3].

Aside of lack of resource in the research and technology development and innovation, there are other challenges that we need to address it properly, such as ethic and legal. There is a plurality of ideas on what ethics is and how it should be practiced. The emerging science and technologies are likely to provide numerous benefits to mankind and our natural environment. Responsible governance that deals thoroughly and proactively with potential hazard and other ethical concerns is the best strategy in rder to promote the positive developments to be expected.

The implementation of technology into society is a complex, open-ended and unpredictable process, and risk and side effects cannot always be anticipated. When the risk and side effects finally are known, they are known because they are being experienced. And by that time they may be virtually irreversible due to their magnitude or their entrenchment into social infrastructures or human culture. This means that govenrnance of science and technology is bound to be outdated and too late if it merely responds to concrete realities in the form of well establishedtechnologivcal applications existing in use and in the market. Political and regulatory has to include an element of anticipation, acting upon what does not yet exist but is thought to be the science and technology of the future. Indeed, due to the rapid pace of development, there is not only a time lag in political and regulatory action, but already also in the interpretation and understanding of development. Sometimes, new thing are made faster than they are understood. Making, however sophisticated, may be a limited task of design and assembly, while understanding requires knowledge of the myriads of interactions between the new yhing and numerous other elements in nature and culture.

The science and technologies of the future is an even more peculiar object to take into account in governance. It is not material as such (while of course preliminary research results or technology pilots may be material). Indeed, scholars of the interdisciplinary research field of science and technology studies have convincingly argued that research policy as well as research practice are heavily dependent upon sociotechnical imaginaries, that is, narratives that imagine present and future society, present and future science and technology, and how they interact. The bio economy; the transformation of chemical industry by nano technology; the automation of health sectors by personal autonomous robots; an ICT future with “a computer on every desktop”. Some of these imaginaries die away, other change, and others are translated into action that shape concrete material reality. What is crucially important for an improved governance of science and technology is to understand that sociotechnical imaginaries are both real and important and not to dismiss them as “science fiction”. Sociotechnical imaginaries are a constructive part of any understanding of science and technology from which one may make ethical, political and regulatory judgments.

From the point of view of governance of science and technology, there are teo important approaches to sociotechnical imaginaries; First approach, their existence should be treated as an empirical matter of fact. The Thomas Theorem of social science and psychology states that “what men perceive as real, is real in its consequences” [3]. The Thomas Theoreme applies to sociotechnical imaginaries. They have real influence on research and policy. Second approach, is to treat them as early signal and early warnings, that is to be used in foresight exercises as predictive information of the actual science and technology in the future. As such, this is inherently uncertain and unreliable informstion and there is no mature research-based knowledge for how best interprets and manages it. Whether such knowledge may be developed, is also uncertain. Early warning based on imaginaries may very well warrant monitoring schemes that may be voluntary or required by law. They may also be taken as worst case scenarios that in themselves may warrant legislation and regulation, such as with human cloning (prohibited).

Sxcience governance and the science-society relationship are currently being reshaped by comprehensive and far reaching dynamics that require both new thinking and new ethically based institutional responses. Among this dynamics, the most significant are; a) scientific and technological change, which induces new intellectual and institutional models as well as new pathways for technology to reshape societies; b) new social and institutional contexts within which scientific integrity and the equitable distribution of social benefits are palced under pressure; c) tensions between private and public interests that call for renewed safeguards to preserve the public good; d) divisive globalization, which integrates the world without equipping it with broadly shared worldviews on background ethical principles and virtues that can be relied upon to produce practical concensus; e) patterns of exclusion between and within societies, driven by differential access to science and assessment of technology, that demand ethical approaches both to adapted development and to social inclusion.

4.2. Innovations and New Technology

Innovation is the process by which new products, processes, methods or service are created. Innovation offers added value for end users by providing better and/or cheaper functionality than previous option. Innovation combines changes in technology, business model, organization, etc. The basic idea may be a new technical solution, a new business model or a change in organization. More often that not, however, changes in all aspects are required in order to realize rhe full potential.

In a competitive economy, no business can survive long term without updating its products and services or the new ways in which they are produced or delivered. Innovation policy must promote across all business sectors and not just focus on high tech industries.

Since most innovation are complex and each subsystem has its own limitations, an important part of the innovation process is finding the right balance between conflicting demands. In most cases, there are several possible ways of providing a new function to users, or possible applications of a new technology. Which combination of features the market will prefer cannot be predicted with any certainty. The ultimate value of an innovation is also build through adaptation and improvement, often accumulated over decades. Whether the origin was a market opportunity or a new technology capability, innovation can best be thought of as an iterative, experimental search process.

Innovation integrates knowledge from anumber of dufferent fields such as technology, market, design, economics, etc. It is hard to collect all the necessary competences in a single organization. The cost are high, competence quickly becoming outdated, and the company misses opportunities to learn from a broader set of experiences.

Thus, innovation has become a process of constant interaction with current or future customers, with suppliers and competitors, with consultants and with academic reasearchers. Innovation system is our way of summarizing the patterns of interaction and mutual dependences between business and public actors. The capacity to innovate depends on how well different parts of this system are adapted to each other and how well they work together.

5. CONCLUSION AND RECOMMENDATION

The existence of government in making policy and develop strategy and support is higly required to drive tehnology development in the country. Simultaneously, improvement of education in Science, Technology, Engineering and Mathematics (STEM) is required to motivate the youth to choose this education. Family has to drive their children to be interesting in study STEM.

DAFTAR PUSTAKA

[1] Kearney, C (2016). Effort to Increase Students Interest in Pursuing Mathmatics, Science and Technology Studies and Careers. National Measure taken by 30

countries – 2015 Report, European Schoolnet, Brussels.
[2] Keri Facer, Learning Features, Education, technology and social change, First edition published 2011 by Rotledge 2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN
[3} Roger Strand & Matthias Kaiser, Report on Ethical Issues Raised by Emerginf Sciences and Technologies, Centre for study of the Sciences and the Humanities, University of Bergen, Norway, 23 January 2015.
[4] Report of COMEST, Ethical Perspective on Science, Technology and Society: A Contribution to the Post-2015 Agenda, SHS/YES/COMEST-8EXTR/14/3 Paris, 31 July 2015
[5] UNESCO Report Engineering: Issues Challenges and Opportunities for Development, Published in 2010 by the United Nations Education, Scientific and Cultural Organization 7, place de Fantenoy, 75352 Paris 07 SP, France