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on Science Technology and Innovation
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Session 3: Competitiveness & Innovation in the Modern Economy.
Address of Dr Shaukat Hameed Khan, Coordinator General, COMSTECH

Excellency, Ladies and Gentlemen

I am deeply honoured to share some thoughts with this august gathering in this beautiful city of Astana. I am especially happy that the Ten Year Plan, prepared by COMSTECH, and is now called the OIC STI Agenda 2026, has been approved as the Astana Declaration.

There is a strong belief among our countries that STI is a magic wand, which we can embrace, in order to take our countries into the group of knowledge economies.

I will attempt to address this by raising some basic questions.

1. Why are some countries more competitive and innovative than others?
2. What lessons are there for countries trying to play ‘catch-up’?
3. Is there such a thing as an “entrepreneurial university”, *and* should a university focus on *economic output only* from its graduates?
4. Can we teach innovation? This reminds me of the old question posed by Socrates who had asked *whether morality can be taught!*

To answer these questions we must first understand the disruptive nature and the emerging relation between science and society in modern economies. Its morphology is not yet clear, but its distinctive feature is a transnational / vertical division of labour and diffusion of work, technology, and ownership, all of which require matching of transnational skills.

We now have the death of distance and do not need physical proximity to take major decisions. As an example, I can foresee that perhaps in ten years’ time, we will probably meet and talk virtually, using digital technologies.

Excellencies,

Economic advancement is an extremely complex process.

Every nation now wants to become a knowledge economy.

However, we must remember that science and technology alone is not a magic wand.

If we wish to be part of the great game of the 21st Century, which revolves around science and technology, we must learn from those who have gone before us and with whom we wish to play “catch-up”.

Extensive studies have been carried out to understand why some countries have been able to transform themselves during the last 150 years. These include German efforts to reproduce the British industrial evolution, Japan’s Meiji Revolution in trying to catch up with the West, Europe with the USA, and most recently the East Asian countries and China.

There is one major conclusion: it is not possible for a country to replicate exactly those who have gone before, because the conditions for entry have changed. Latecomers must therefore dance to their own music.

This, however, needs some good orchestration.

From the 1970s to 90s, it was noted, that manufacturing could be done anywhere; now designing, too, can be undertaken anywhere, and this shift appears to be irrevocable as was noted by Pascal Lamy in 2005.

Yes, it is true, that science and technology can produce economic growth, and without economic growth, science will not flourish; however, we need funding to do good science!

Yes, it is true that economic growth may lead to more jobs; better health and education; and higher productivity; all of which can lead to more growth and a new cycle. However, we must remember that we can also have growth without more employment, in the present and foreseeable future!

I wish to emphasize that economic growth in the 21st Century were dependent upon a new breed of worker, ranging from the scientist to the ordinary employee coupled with innovation and productivity brought about by employing the tools of science and technology.

We now talk about the Fourth Industrial Revolution. Every Industrial evolution was based on higher and, different skills required for the modern economy of the time. For achieving productivity gains, and improved capacity for innovation, the skilled worker may actually be more important than the research scientist.

Excellencies, Ladies and Gentlemen,

Let us not burden our universities with economic outcomes only, and not follow blindly the model of a small number of universities in a few advanced countries. *Education coupled with appropriate employable skills is the key.*

We are also all facing an emerging disruption because of the blurring of boundaries between scientific research and technology application. The two communities of researchers and technologists and their activities do not differ as much in their methods

of enquiry and pursuit of knowledge, as in their reward structures and approach to the *disclosure* of knowledge.

The fundamental difference between the two strains lies in the division between public versus private knowledge systems, science being supposedly free (what Polanyi called the philosophy of the ‘republic of science’), while technology is driven by secrecy, profits and production of industrial goods and services or military hardware.

Moreover, innovation does not come in major big steps, and is more likely to be small steps, which bring about gains in productivity and efficiency.

Excellency, Ladies and Gentlemen

Every country wants to build a ‘knowledge’ economy!

Let us quickly examine innovation, which is now supposed to be the main driver of economic growth. How do we bring this about?

This will be possible *only* if the dynamics and disruptive nature of managing modern technology are understood *and* embedded as a key pillar of public policy, which can lead to enhanced innovation and productivity.

What do we do? Who will be the agent of change? How do we manage technology?

First, if we want to play ‘catch-up’ we must understand that this will not happen, unless there is a congruence between technical capabilities and social capabilities. We Muslims are sometimes afraid of science and technology, whereas it has been part of our heritage for centuries. The true scientific culture is generally absent except in a very few countries.

We must therefore accept the disruptive nature of science and technology in this century, and make the pursuit of knowledge our major goal.

Second, the agent of change has to be the government, in order to generate new combinations of science and engineering, market research, organisational experience, all of which promote productivity and competitiveness. The state must provide institutional support in the form of technical intelligence for managing and promoting technology.

The government must also pick the winners, as happened in East Asia, and most recently in China. It must then provide innovation support from the universities, technical colleges / vocational training organizations, and R&D institutes, as well as business associations and finance institutions.

Third, there is need for technology foresight and technology transfer agencies such as KISTEP in Korea. With these ingredients in place, it will be possible to develop soft infrastructure and social capital for managing technology, as well as providing the tools for technological readiness in our countries.

Fourth, a major proposal in the Ten Year Plan prepared by COMSTECH is joint multinational execution of some Big Science projects, ranging from space to astronomy, marine biology, high performance computer facilities for simulation and design, climate change, glaciology, design of modern teaching aids and equipment, etc. These will have major economic spill over also.

As an example, all OIC countries are investing in new power plants or in renovating old plants. Let us consider consortiums for joint manufacture of components and modules such as turbines, turbines and control rooms. This will improve economies of scale for production.

The opportunities are immense. COMSTECH has proposed a Venture Capital Fund for existing technology based SMEs (small and medium enterprises), and high tech start-ups. This will have a major impact, especially in biotechnology and IT and the energy sector. Managing 'big data' with security will be of paramount importance.

Excellencies,

We do not know one another's capabilities. We can improve our capacity for innovation by exchange of academics and scholars. I urge all Member States to contribute scholarships for full time study as well as offering hospitality for senior researchers for 2-3 months in their national universities and research institutes. Please make your country offers under the Ibn Al Haitham Exchange Programme. I am targeting 5000 exchanges in the next ten years.

Fifth, I invite your attention to the fact that while excellent Vision Documents and Declarations were prepared by OIC Member States in the past, the mechanisms for implementation and monitoring were unfortunately missing. The Ten Year Plan attempts to fill this gap. The structure for steering the process has been prepared, and is an integral part of the Astana Declaration.

In the end, I wish to point out that member States will be at the heart of the entire exercise of implementation and monitoring. Kindly nominate your leading scientists and technologists to be part of this exciting process.

Let us jointly carry out this activity of creative destruction, replacing the old in order to bring in the new system and its processes.

Let us manage this change though by improving our internal and external efficiencies, and let us define flexible delivery processes.

Let us be irreverentin that lies our salvation.

Remember every nation wants to be a knowledge economy. The competition is immense, and history will not wait for us.

In the end only one thing matters, human capital and social attitudes.

Thank you.