Topic 1. Science and Society

1. The role of science in the modern information space. History of Science

Science is a systematic study of anything that can be examined, tested, and verified. From its early beginnings, science has developed into one of the greatest and most influential fields of human intention. Today different branches of science investigate almost everything that can be observed or detected, and science shapes is the way we understand the universe, our planet, ourselves, and other living things. During scientific investigations, scientists put together and compare new discoveries and existing knowledge. Scientists apply existing knowledge in new scientific investigations to predict how things will behave.

Since prehistoric times we have observed the heavens and tried to make sense of changes in the position of the sun, the moon and stars. In about 4000 BC, the Mesopotamians tried to explain their observations by suggesting that the Earth was at the center of the Universe, and that the other planets and stars moved around it. Early humankind also observed that certain plants could be used to treat sickness and disease, and herbal medicines were developed, some of which are still used.

Similarly, Aristotle and Plato developed logical methods for examining the world around them. It was the Greeks who first suggested that matter was made up of atoms. Science was also being developed in India, China, the Middle East and South America. Despite having their own cultural view of the world, they each independently developed materials such as gunpowder, soap and paper. However, it wasn't until the 13th century that much of this scientific work was brought together in European universities, and that it started to look more like science as we know it today.

The progress was relatively slow at first. For example, it took until the 16th century for Copernicus to revolutionize the way that we look at the Universe.

It was in the 17th century that modern science was really born, and the world began to be examined more closely, using instruments such as the telescope, microscope, clock and so on. It was also at this time that scientific laws started to be put forward for such phenomena as gravity and the way that the volume, pressure and temperature of a gas are related.

In the 18th century much of basic biology and chemistry was developed as part of the Age of Enlightenment [ɪnˈlaɪtnmənt]. The 19th century saw people like John Dalton, who developed the atomic theory of matter, Michael Faraday and James Maxwell who both discovered electricity and magnetism. Each of these developments forced scientists radically to re-examine their views of the way in which the world worked.

However, scientific discoveries can also have a negative impact in human affairs. Over the last hundred years, some of the technological advances that make life easier or more enjoyable have proved to have unwanted and often unexpected long-term effects. Industrial and agricultural chemicals pollute the global environment, even in places as remote as Antarctica, and the city air is contaminated by toxic gases from vehicle exhausts. Science can also generate technology that is deliberately designed to harm or to kill. The fruits of this research include chemical and biological warfare, and also nuclear weapons, by far the most destructive weapons that the world has ever known.

In all fields of science, old or new, researchers use the same systematic approach, known as the scientific method, to add to what is known. As a result, the science gives us an ever more detailed insight into the way the world around us works.

2. Fundamental and applied sciences: problems and achievements

There are different branches of science. Let's identify 5 ones:

1. The mathematical sciences - investigating the relationships between things that can be measured or quantified in either a real or abstract form (arithmetic algebra, trigonometry);

2. The physical sciences - investigating the nature and behavior of matter and energy on a vast range of size and scale (mechanics cosmology thermodynamics);

3. The earth sciences - examining the structure and composition of our planet, and the physical processes that have helped to shape it (geology, geography, mineralogy);

4. The life sciences - studying of living things: a principal branch of science concerned with plants, animals, and other living organisms (botany, zoology);

5. The social sciences - exploring human society past and present, and the way human beings behave. (law, statistics, economics, psychology);

We all know that our present age is the age of the scientific and technological revolution. Thanks to its achievements, people have for the first time really come to discover the fundamental laws of nature: they have penetrated the depths of the atom, are investigating the world of stars, the laws of heredity [hɪˈredɪtɪ] and essence of life. The achievements of science have penetrated into all spheres of life. The results of scientific investigation are very important for the improving of living conditions, transport, communications, etc.

Nowadays mankind faces a lot of problems. One of them is discoveries in the field of the exploration of solar energy. Also, it would be great if we could succeed in solving the three main "killers" of this century – cancer, heart diseases and AIDS (acquired [əˈkwaɪəd] immunodeficiency syndrome). But the main condition, which is essential for the solution of these problems, is the close collaboration of people of different nationalities and religions in the further development of our planet.

3. Development of science in the Republic of Belarus

Belarus has a well-developed system of public institutions supporting innovation activity which form the backbone of the National Innovation System (NIS). The State Committee for Science and Technology (SCST) is a public body under the Council of Ministers of the Republic of Belarus which is tasked with a range of important responsibilities in the area of innovation policy and governance.

The National Academy of Sciences of Belarus (NAS) is a complex hierarchical [haɪərˈɑːkɪkəl] structure which brings together the most important R&D organizations in the country. The organizational structure of the NAS includes different institutes, departments, some 70 research organizations as well as a number of laboratories, design bureaus [ˈbjʊ(ə)rəʊ], production facilities, experimental stations and other support bodies. For the National Academy of Sciences of Belarus (NAS), innovation is at the top of the agenda. A gradual shift has been made since 2010 from scientific research activities (basic research) to scientific-technical research projects.

The entire system of education in Belarus, including higher education, falls under the functional responsibilities of the Ministry of Education. Within the Ministry of Education there is a Department of Science and Innovation, whose main functional responsibility is the practical implementation of public S&T and innovation policy within the Belarus education system.

What concerns higher education institutions, universities and facilities, recent changes put emphasis on strengthening industry-science linkages, for instance by supporting internships. Furthermore, researchers and students can participate in innovation competitions and create start-up centers. Four of the seven technoparks are based at universities.

4. Science, Technology and Innovation in the context of sustainable development of society

The meaning of the terms science and technology have changed significantly from one generation to another. More similarities than differences, however, can be found between the terms.

Science – 1) the study of the physical world and its manifestations, especially by using systematic observation and experiment. 2) a branch of science of a particular area of study.

Technology – 1) the study, development, and application of devices, machines, and techniques for manufacturing and productive processes. 2) a method or methodology that applies technical knowledge or tools.

Both science and technology mean a thinking process, both are related with causal relationships in the material world. Science, at least in theory, is less concerned with the practicality of its results and more concerned with the work out of general laws, but in practice science and technology are involved with each other.

Indeed, the concept that science provides the ideas for technological innovations is essentially a myth [mɪθ]. Fundamental tools and processes in the fields of mechanics, chemistry, astronomy, metallurgy [ˈmetəlɜːʤɪ], and hydraulics [haɪˈdrɒlɪks] were developed before the laws governing their functions were discovered. The steam engine, for example, was commonplace before the science of thermodynamics [θɜːməʊdaɪˈnæmɪks] found out the physical principles underlying its operations.

In recent years a sharp value distinction has grown up between science and technology. Advances in science have frequently had their opponents, but today many people have come to fear technology much more than science. For these people, science may be perceived as a serene [sɪˈriːn], objective source for understanding the eternal laws of nature, whereas the practical manifestations of technology in the modern world now seem to them to be out of control.

Well, simply put, without innovation it would be difficult to make progress. Organizations and societies would stagnate [stægˈneɪt]. Innovation is what drives us forward. There are several ways a company can be innovative with their products and services. Today we will look at four of them.

1. Using the latest technology to improve your product / service.
2. Responding to customer demands by changing what is on offer.
3. Offering a new product / service to reach new customers.
4. Changing the way you provide a service.

Not all innovation will bring success to our businesses, but it can give us the opportunity to grow and learn more about what we do and what our customers might want.