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Primary Technical Education and the Technology Development

Terms describing a variety of technologies

In the era of technical progress, man lived to see many definitions of "technology". This term has various meanings depending on the point of view. "Technology" means achievements which man has been perfecting over the centuries. [2, 15, 16] It can also mean a subject occurring in the teaching programs from primary schools to high schools, under various names dependent on the class profile. Everyone wishes to clarify the word "technique" and "technology" and has their own definition of the word. The concept of "technology" in today's world is beyond the Greek "techne", which in ancient times meant the ability to do something or to direct someone. In Latin it was "arras", which is translated as art. This word meant knowledge of how to rule the world. Irrational proceedings were considered in opposition to art and therefore "techne" was related in meaning to "episteme". In both cases it was about knowledge: in "techne" – detailed knowledge and the said nature of individual entities, and in "episteme" – common knowledge, which is necessary and lasting. [9] In the modern world the word "technique" is used in various fields, such as: drawing technique, injection technique , the technique of reading comprehension, etc. However, such definitions of the word remain in the shadow of another, i.e. technology, as a human creation, which is designed to raise funds that make up the materials and data which allow man to skillfully use these funds. Pope John Paul II understood the word technology as "aptitude for work". All these definitions are similar. After all, they are aspects of the same reality, which includes: creativity, work, recipient, and finally the product. Therefore, in order to know the technology one must use reason.

The Polish dictionary states that technology is defined in two ways. The first gives the definition of art as a wide range of measures and activities pertaining to human activities related to the production of material goods, [5] while the second shows the technology as purposeful, rational, and theory-based method of performing work in a particular area. [12] One can easily notice that even people involved in defining the terms are not able to clearly define the term technology,

because it shows the real purpose, which is planning a man's good. Today one can use this word in a very wide range of situations, because it became common in general language.

The importance of technology in the development of mankind

Technology is a concept commonly understood as a means to make our life easier. At the same time practice shows that many inventions which make people's life easier were created too late, but thanks to inventions that have been made, we can safely say that we have a high level of civilization development. From ancient times man seeks to simplify his life and for this purpose he invents things that help him to achieve what he wants and needs. Without inventions, technical progress it is very likely that we would still live in the Stone Age. In time, the development of inventions significantly improved the quality of people life. The consequence of this is a highly developed economy and industry present now in the twenty-first century. Nowadays we can discover the secrets of extraterrestrial life, send a man into the space as well as find a cure for many diseases once considered incurable. However, from another point of view, this thirst for modernity caused suffering of the planet on which we all live and operate**.** As progress and development are constantly changing, our state is becoming more complex and more perfect.

The importance of technology for the development of science

The connection between technology and science is really a connection between technical invention and scientific discovery. This link was visible in ancient times, when attempts were made to study events that occur on Earth. First technicians-inventors working on the results were scholars-explorers. Widely known inventors, like Archimedes, discovered many laws of physics, endless screws, the leverage etc. It was done in the third century BC.

Ties between science and technology were weakened in the Middle Ages, when the only prevailing philosophical movement, supported by the authority of the Church was Aristotelianism. Inventions in this era were made strictly on the basis of random observations. However, also in this period of time, scientists were working on their own research, like for example Roger Bacon, who invented glasses for far-viewers. Renaissance brought increased popularity of scientific studies. The most important man of Renaissance was Leonardo da Vinci, the artist who planned to construct a flying machine by watching the flight physics of birds. The attitude towards scientific research has changed dramatically since the shift from the geocentric model of the world to the heliocentric one announced by Nicolaus Copernicus. During this period, another great invention had been made, the invention of print, which allowed the publication of studies of modern physics by Galileo, Newton and Robert Boyel in the seventeenth century, which later influenced the further development of technology.

The pioneer inventions in eighteenth century, which led to the industrial revolution, were designed by people with technical skills in various occupations unrelated to science. The first steam engines were constructed by a blacksmith – Thomas Newwmen, a naval officer – Thomas Savery, and a craftsman-engineer James Watt. In order to make better use of the scientific discoveries some decisions had to be made, like for example to provide access to proper education to workers. This became possible in the nineteenth century, when technical education had been developed and trained technicians started to appear. Science and technology gained momentum in the mid-twentieth century, defined as the technical-scientific revolution. Both of these areas today exist in close symbiosis, necessary for their mutual development. Currently the close relationship of science and technology is commonly used as an adjective - "scientific or technical knowledge". Associations and technical and scientific journals were created under the patronage of universities. The computer and the virtual world are both an invention of technology.

These days computing resources and IT are widely available. A computer has become one of the essential elements of human life. Without this unit we CANNOT imagine the functioning of the economy, but not only computers became a part of life as a useful tool for your daily work. Access to the Internet, sending and receiving e-mails are a new chapter in the history of the information flow. Many authors write about it, inter alia: Depešová, Kiełbasa, Knych, Tureková. [1, 6, 7, 14] Nowadays human-computer cooperation is necessary in the process of the creation of virtual reality. The term "virtual reality" was created in the 1980s. Virtual reality is an unreal world generated by a computer with the help of additional multimedia accessories. The essence of this reality is to create an artificial environment, a replica of the real world created by images, artistic effects etc. Nowadays, virtual reality is an artificial world created in the computer in three-dimensional environment where people can control virtual objects. It is the result of extensive real time graphics processed by three-dimensional systems. The virtual reality is a full, interactive illusion of reality made of components and changing environment. It blurs the line between illusion and reality. The virtual world is a interactive world.

The use of virtual reality can be found everywhere, from games to simulations of medical operations. Virtual reality is also important in the area of robotics, where it increases the control over robots used in an environment hazardous for human beings. The medical use of computer simulations can be useful to predict the result of operations or simulate a complicated surgery. In the army, simulations are used to obtain and analyze technical data, e.g. on the battlefield, where soldiers need such information as a necessity. Virtual reality is used in many areas of life. It can be used in space research, genetic engineering, economy, industry, etc.

However, there is also the other side of the virtual reality coin. By applying it we limit our opportunity to meet with other people. We do not put as much effort as we would in the reality. We are aware that it is just an unreal, virtual animation. Virtual

reality is one of the branches that is constantly evolving, which is why the average person has trouble keeping up with it.

The essence of technology education

The concept of "technological culture" has been used for a long time. This term has been clearly understood by many authors, but they all show a different scope of it. T. Nowacki portrays it as skills to use a set of technical equipment and technology products according to their purpose. This means using tools and machines in such areas of our life where they can give us benefits. The author restricts the concept of "technologic culture" to skills and measures, but points out the moral stance, specifying it as suitable for use to fulfill human needs. Sometimes this term is defined as a human feature, described as skillful, attractive, and socially useful relation between men and technical equipment. On the other hand, it is a way of using devices to attain the highest level of the economic, social, and spiritual ladder. On the basis of pedagogy one can use the definition of "technologic culture". Z. Dabrowska shows the following factors of technologic culture:

- basic knowledge of modern technology and economics that allow one to understand modern civilization;
- intellectual and technology skills, that allow one to ensure efficient work (not just production) and resourcefulness in everyday life;
- attitude of responsibility, integrity, interest and involvement in the common work to improve living conditions;
- ability to update the technical knowledge and methods of operation, depending on one's needs.

A similar position to the one above is presented by H. Pochanke, who believes that the technical culture includes:

- a certain level of technology expertise based on a solid general knowledge, allowing the technology to evaluate its products and design and develop a creative attitude towards it;
- a group of manual and mental skills, allowing a proper contact with the technology, reasonable use of technical equipment, design and production of new material goods and planning actions in this field, in other words, correct, and socially proper behavior in a variety of technical issues;
- appropriate level of socio-moral attitudes, in particular responsibility for the personal and social consequences of technical activity. [10, 11].

Two of the positions above are more complete than others which may be found in the literature. "Technologic culture" is determined by three components - technologic expertise, the ability to apply a technologic approach and resource efficiency. However, this is not the full scope, it doesn't illustrate issues arising from the relationship between man and technology.

According to F. Zywert, the definition of "technologic culture" comprises:

- comprehension of technologic processes, materials processing, installation of technical equipment, understanding the structure and functioning of a plant and equipment, understanding of the physical, chemical, and mechanical properties of materials and methods of their use (F. Zywert calls it " technology awareness");
- materials processing skills, equipment installation and use of the products of technology, their proper maintenance and repairs;
- appropriate social and moral attitude in the use of the technical products, economical and appropriate use of new materials in the manufacturing process. [17, 7, 15].

The term "technologic culture" is not precise because there is one crucial element missing, the technology knowledge. This definition is as narrow as the term technique, technologic culture should be understood widely, as part of the general culture. This is being pointed out by T. Nowacki, Z. Dabrowski, H. Pochanke, J. Klimczyk, I. Turek. [4, 13].

The current situation on the job market, changes in the jobs structure and the increased use of technology in the lives outside work dictate a different perspective on technological culture. "Post-capitalist society is a society of knowledge, a system of properly understood, operative and integrated knowledge". Technology education is important because the technology along with its devices is a system of great complexity, and at the same time it must be functional. The world is being invaded by technology, so people should understand and recognize it in life. We should be able to explain situations encountered in real life and to preserve rationality. The world of technology is one big variable, so technology knowledge is constantly evolving.

Conclusion

Two things are important in bringing the aims related to technical sciences. First, the cognitive skills, technologic thinking and the ability to estimate results. These assumptions, however, haven't changed, but teaching programs had. Teaching programs have been modified many times, because the development of technology keeps changing, so programs need to follow those changes. Nowadays, technologic activities at school is supposed to prepare young people to adult life, to teach them dexterity, help understand how computer can ease their works etc. It is possible that in a few years this will be subject to violent revolution again, so that the man of the twenty-first century could use its full benefits.

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Abstract

For centuries, man has had a connection with technology, in different forms. In the 18th century the Committee of National Education wished to implement the concept of practical-technical lessons at schools. Lessons of this type trained practical abilities in different kinds of work e.g. digging of gardens etc. These plans failed due to the partitioning of Poland. With time and slow changes taking place general-technical lessons started being introduced at schools, with extended programs, or, depending on the ruling system, they were removed. The name of the subject at the beginning was „practical – technical" lessons, then „technical work", next „technical education" and today it is generally called „technology". Subject has the task to widen knowledge of man within this area and also enables familiarization with technology.

Key words: general-technical education, technical development

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