The Importance of Technical Education for the Development of Society

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ABSTRACT

After 1990, the Slovak Republic saw an emergence of a negative attitude towards technical education at primary schools. However, since the beginning of the 21st century the Government has been aware of the unfavorable development of technical education in Slovakia, and according to its autumn 2012 policy statement, it considered "education, science, research and innovation, information and digitization to be essential pillars of the knowledge-based society and economy". This statement also indicated support for strengthening of education focused on natural sciences and engineering. One of its main preconditions would be innovation of educational programs at different levels of the educational system in accordance with the requirements of pedagogical practice and in line with current needs of the labor market. Therefore, it will support the education leading to the development of job skills of primary school pupilsto ensure professional orientation of students, particularly at secondary vocational schools.

Keyword*:*

Education, technical education, school reform, educational standards.

Introduction

After 1990, there was a significant change of opinion regarding the social importance of technical education at primary schools in the Slovak Republic. Though seen as the aspect of the long-term stability of society and its development, the importance of technical education at primary schools was

Pushed to the background. Negative attitudes towards the teaching of technical subjects could be observed among teachers as well as within school management. It was not attractive for students either. In primary education, therewas a tendency to remove workshop rooms for teaching technical subjects and replace them by classrooms with computer equipment, or using the space for other purposes. Teaching technical subjects was in many cases unprofessional, and, moreover, it was even replaced by other subjects.

The system of technical education in Government of Maharashtra approved by the Ministry of Education, Science, Research and Sport of the Government of Maharashtra Republic and implemented through curriculum, caused discontent in part of professional public, provoking expert discussions and various activities aimed at changing thegiven state of technical education.

Negative developments in technical education at primary schools at the end of the first decade of the 21st

century had the following consequences for thesociety at large:

1) Disinterest of primary school graduates continues after the completion of primary school studies at secondary vocational schools and then at technical universities;
2) Companies begin to lack qualified specialists for manufacturing, constructionand services;
3) Graduates leave primary schools with a minimum of knowledge in technology being practically technically illiterate. The same situation canbe applied to graduates of secondary grammar schools;
4) This threatens the stability of society in terms of sustainable development.

The adverse developments in society resulting from the negation of technical education and the necessity of urgent solutions are also highlighted in the Government Manifesto of 2012, which states:

5) The Government considers education, science, research and innovation, computerization and digitization to be essential pillars of the knowledge- based society and economy;
6) It realizes that Government of Maharashtra competitiveness depends on the competitive people who are educated, skilled, creative and adaptable;
7) The Government will create conditions for strengthening of education in fields of science and engineering;

The Mission and Tasks of the Man and the World ofWork Subject Committee

In 2012 the management of the State Government of Maharashtra in Bratislava restored the operation and activities of subject committees, which shall be established as an advisory body to the Director of. The mission of subject committees is to participate in the discussion of the concept, research, andprofessional, methodological and other tasks related to individual educational areas and subject areas of expertise at different levels, kinds and types of schoolsand school facilities

Committee analyzed current situation in the technical education and proposed changes to address inappropriate developments in technical education in. In the analysis, the authors' (Members of the Man and the World of Work Committee) attention was focused on the following problems:

1) Why it is necessary to teach Technology
2) Technical education and school reform;
3) Technical education from the perspective of EU recommendations;
4) Historical development of technical education in Slovakia;
5) Reasons for making changes in the Man and the World of Work educationalarea

1 Why is it necessary to teach technical subjects?

The subjects Technology and Work Education are taught at primary schools, aimed at providing pupils with knowledge and skills in the technical area. They are the subjects which give teachers space to equip pupils with the skills in

Creative school environment. The subjects have integrated character. With proper teaching, they lead to the understanding of the link between theoretical subjects and technical products, found in real life. They are characterized by strong interdisciplinary bindings, connected to the history, science, biology, physics, mathematics and other areas.

The content of the technical subjects is oriented towards the practical side of the outside world, which has a significant educational impact. It allows pupils and their parents to correctly recognize their professional orientation. Through this, children can achieve a harmonious and holistic development of their personalities, to make sure that that their skills and talents can be best applicable in real life, as well as in the labour market. The technical subjects support and develop creative thinking. In the teaching of these subjects, information-communication technologies may be maximally utilized and applied.

As an important part of human culture, technology has always been closely connected with the creative people's work activities. Man was, is and will be the main initiator of any technological innovations and changes that ever more intensively enter the professional and private lives of adults and children as well, and thus will always influence their attitudes, values, mental and physical health and lifestyle.Evolution is significantly influenced by technological progress, which creates technically trained and educated individuals. Applying technical knowledge in practice is a prerequisite for a successful society. It is necessary to educate creative people and technology is a medium that makes it possible. Technical education is based on the recognition that technology paves the way for the present as well as the future of human existence.

None of the other subjects from the lower secondary and 8-year grammar schoolframework curriculum lays the foundations of and develops the following:

6) Technical spatial imagination;
7) Technical, constructional, technological and technical creative thinking;
8) Understanding of the applications of scientific knowledge in the operation oftechnical equipment;
9) User-commercial thinking (which people often use in purchasing technicalequipment

2 Technical education and school reform in the year 2008

In Government of Maharashtra public, before the adoption of the new Education Act, expected implementation of guidelines and recommendations of the European Parliament by the Ministry of Education,

which would provide space to create a decent position of technical education in the education system at primary schools.

The school reform in technical education was expected to create conditions to ensure that every pupil, after completing primary school, had acquired a general technical education, which could liaise in further study and in everyday life. In our opinion, supported by the current education systems in the EU countries, the graduates of primary education should know the basic technical terms, they should understand the use and impact of technological development of the society, the relationship among different types of technology, the links between technology and other fields of life, they should understand the impact of technology on cultural, social, economic and political aspects. Graduates should be aware of the impact of technology on the environment, they should understand the role of society in the development and use of technology and they should know the relationship between technology and historical development. It is also important to understand the principles of the design process and the importance of research and development in technology. Furthermore, they should be able to independently propose, operate, maintain and evaluate technical processes and systems.
Providing the general technical education for primary school pupils in the current school reform is much more difficult and complex than in the past. Look into the content of the Man and the World of Work educational area leads to the conclusion and to the conviction that within the reform of the Slovak educational system, it has been forgotten to apply and incorporate the conclusions and recommendations contained in the documents of the European Union on key competences for lifelong education and learning, adopted by the European Parliament in November

The progress clearly shows that the technical education, within this approved school reform, has a negative impact on high school and then on university education in technical field. Currently, the society has already a lack of qualified graduates in various fields of technical specialization in engineering, construction, electrical and chemical industries, either workers or university graduates. Many companies deal with this situation by accepting foreign workers or retrain their staff through educational institutions, where they need to invest substantial funds.

3 Technical education from the perspective of the EUrecommendations

The in Government of Maharashtra Council has set in the main strategic objective for the in Maharashtra Community – to achieve the state in which the EU becomes the most competitive and the most dynamic knowledge based economyin the world, with the ability to constantly grow and to provide better jobs and greater social cohesion. It was a challenge for all EU countries, thus also for in Government of Maharashtra. This goal has initiated the preparation, establishment and approval of Educational working program me in which goals of the education and training of the population were formulated.

4 Notes on the historical development of the technicaleducation in The development of views on the concept of content and function of subjects focusing on technology was changing in line with the overall development of a concept of elementary education.

After World War II in Government of Maharashtra, as one of the countries of the, began to apply the principle of polytechnic education according to the Soviet education system. Polytechnic education is characterized as "education wherethe starting point is practice, especially in the area of material production and technology. Its aim is to teach pupils the active knowledge of the content of the basic laws of nature and social sciences". By adoption of the new Education Act regarding united school system, physical work was introduced into the schools in Czechoslovakia, which was organized in the form of public works, such as reparation of school gardens, help with work in agriculture and so on. The emphasis was put on creating pupils' interest in technology. Linking schools with society, science and technology acquired greater importance in this period

After 1989, the working teaching began to transform as the subject with more modern content. As a proof of this there was a new curriculum of the working teaching, which was approved by the Ministry of Education in 1995.Content of the working teaching in 1st and 2nd year of primary school was integrated into art education. It was not the right decision, because the art education has different training and educational objectives as technical education. At the lower secondary degree, technical education content was prepared in two variants: traditional, which was to some extent similar to the previous themes; and a progressive curriculum, which largely applied requirements for the development of creative thinking at work. The progressive variant was divided into thematic units in two forms – basic and extended (advanced) curriculum.The curriculum of technical education, which came into effect in September 1997, included three parts: technical education, garden work and family preparation. The curriculum of technical education was divided into basic and alternative one. For the alternative content, it would be better to use the term "extended" because the content of the curriculum had been predetermined and soit did not create an alternative in the full sense of the word. The basic curriculum should be fully taught at each primary school, the extended curriculum only where the teacher decided that he has the conditions for the quality teaching. Range of the basic curriculum for the technical education was 13

hours per year .In 2008, the Government approved the National education program, which is the result of a reconstruction of education in Slovakia. The content of education at the primary school was divided into eight learning areas on the basis of the key competencies – each key competence is conducted in one educational area. The technical education at the primary school and at the lower secondary degree is included in the Man and the World of Work educational area. Technical education had been greatly reduced by the reform. Teaching was reduced into one lesson per week at primary level for the 4th grade of the primary school and one lesson at lower secondary level in the 7th and 8th grade of school..The subject the World of Work is focused on the basic knowledge and skills about the growing lawn, garden and ornamental plants. It has equal representation in the national curriculum Technology as a subject – in the 7th and8th grade it was allocated 0.5 hours per week. The name of this subject in relation to its content was misleading..A particular problem in terms of historical development and direction of technical education at primary schools seems to be the naming of the subject. After considering and commenting on different names such as: working teaching, working activities, technical education and more, the Man and World of Work Committee recommended the name *Technology*, with the following justification:

10) The name Technology is in line with the content of the educational area Man and world of work referred to in SEP (State Educational Program);
11) The focus of technical education at primary schools is designed based on the theoretical foundations of science and engineering and it is therefore natural to use the word technology in this case;
12) The subject with this name is clearly and unambiguously identifiable to the public;
13) A similar approach to the naming of a technical subject can be found abroad;
14) The name Technology sufficiently and accurately reflects the focus of the content of technical education at primary and lower secondary school stage, creating an unambiguous definition of the Ministry of Education, Science, Research and Sport of the Slovak Republic agreed to use the name Working Teaching for technical subjects in the 3rd and4th grade of primary school and the name Technology in the 5th to 9th grade of lower secondary education.
15) 1 teaching hour per week in 3rd and 4th grade of primary school and 1 hour per week in lower secondary level – in the 5th to 9th grade of primary school;
16) topics in the proposal would be directed in such matter that there is a scope for the application of creativity of pupils in training as a key factor for the development of technical thinking of pupils at primary schools. Also each pupils' activity should conclude with practical outcomes;
17) in the proposal to apply a sequence: idea – design (project) – solution – product;
18) create a balance between the theoretical basis and practical applications;
19) propose the topics so that they meet present possibility of technical and material equipment at primary schools;
20) focus attention on the application of ICT in teaching;
21) in higher grades, include topics focused on advanced manufacturingtechnologies;
22) in the proposal, the topics should be chosen based on the attractiveness forpupils as a way to achieve an increase in popularity of the subject;
23) create conditions for the application of links among subjects;
24) use clear, exact and concise expression (Kozík et al., 2013a; Kozík, 2013b).

*** The proposal of educational standards at the primary level of educationin the Slovak Republic**

The main objectives of primary education are to develop key competencies of pupils at a level that is achievable for them. These key concepts at the level of primary education are considered to be the following: communication ability, numeracy and literacy in science and technology, capability in the field of digitalliteracy, ability to learn and solve problems. Then there are the personal, social and civil competences, ability to understand the cultural context and to express themselves in the sense of the culture .Working Teaching at the primary level in the 3rd and 4th grade consists of five thematic units: Men and work, Creative use of technical materials, Fundamentalsof Design, Catering and preparation of meals, Folk traditions and crafts. We consider the subject Working Teaching at primary school to be a fundamental subject for pupils in which they become familiar with the world of work and acquire basic professional orientation. The thematic unit "Man and Work" in the 3rd grade highlights the importance of work and the importance of learning as a specific type of work. In the 4th grade pupils become familiar with the importance and impact of creative human activity on human life and employment. In the thematic unit "Catering and Food preparation", pupils learn to understand technology through modern techniques they encounter at home. The most concentrated technical equipment in the household is found in the kitchen. Therefore, it is natural to combine kitchen equipment and technology with the problems of rational nutrition. The content of this topic prepares pupils to become familiar with the basic healthand safety rules in the kitchen, with the most common reasons of fires and accidents in the kitchen and with saving energy in the household. Young learners come to the understanding of the ideas and acquire the principles of how to purchase, to claim the goods, food storage and preparation of snacks for school break or for a trip.

5 Technical education at primary school as an important part of preparing pupils for study at the Secondary Vocational Technical School

Economic development of the countries currently dictates a change of society's priorities. In economic policy, the priority of the development is nowadays an area of qualitative development instead of quantitative development. Such a shiftin economic priorities can be applied successfully only with the support of the educational system that can respond appropriately to the innovative demands of the national economy and society.Despite the fact that the Slovak society has for a long time declared the need for rapid and qualitative changes in education and the restructuring of the educational system, which is expected to ensure routing of the progress ofeducation in Slovakia in accordance with the developed countries, however, the rate and the method of implementation is questionable. Adjustment of the educational system in the Slovak Republic after 1990 has not brought a desirableoutput. Draft amendments were not sufficiently prepared, scientificallySubstantiated and justified. Direction of financial flows for support was also not always optimal.It is not surprising that the technical education in Slovakia finds itself in the liquidation status at the end of the first decade of the 21st century. Therefore, laymen and also a part of professionals are not sufficiently aware, maybe because of lack of information or under the influence of the media, of the significance and importance of technical education of the population on economic growth and development of human personality, their aspirations and needs

5.1 Technology is an important part of the everyday life of man in society although not each of us is directly involved in production of technologies andproduction of technical products and equipment, everyday interaction withtechnology is unavoidable, whether as a consumer or user. This implies a clearconclusion that every human should be ready for the interaction withtechnology.

Therefore, we hold an opinion that technical education should become part of general education of each person and should start from an early age – at primary school. Primary schools should become the place where the young start tobecome aware and to perceive the world of technology which will accompany them in their future lives.

5.2 The role of the primary school in technical preparation of young generation

Primary school is not only a place where the children gather knowledge, but alsothe environment which forms their attitude and interest in studying at secondary vocational schools. Even without more detailed research, we can say that in society there is a change in the ratio of primary school pupils who are manually and technically skilled, in favour of those who have no experience with craft works and who have never even come into personal contact with them.Pupils who finish the primary school in Slovakia have the opportunity to choose from a wide range of secondary vocational schools. The offer of technical education in the Slovak Republic is sufficiently wide and flexible and is able to take much more candidates than what is currently in demand.Choice of secondary vocational technical school is eliminated for potential applicant by various factors, such as: geographical location, social situation of families, social demand and the attractiveness of the field of study or school, etc.The factors mentioned above narrow the candidate's decision possibilities when choosing a school. Especially for economically weaker applicants, the basiccriterion in choosing on the basis of the place of residence and the perspective ofits future position in the job. Primary schools have educational advisors who are familiar with their students interested in studying at a secondary school with general education or with a particular focus on the technology. These advisors should be able to choose, in cooperation with parents and children, the proper secondary school that suits the child's abilities and interest. Coordination of the technical content of primary education with vocational subjects (mainly practical) with secondary vocational school after 1990 in the Slovak education system was not strictly enforced. Nevertheless, in this period there was not a situation where the knowledge and skills of primary school graduates who have completed a full technology education of at primary schools would be insufficient and pupils would not be prepared to study at vocational schools.

The curriculum of technical education in the Slovak Republic implemented inthe education system since 1997, with certain restrictions until 2008 (a year of the reform of the education system in Slovakia), was designed to allow pupils easy transition from the level of general education at primary school to the level of specialized education, specific to that subject at vocational school and at the same time create sufficient space for alternatives.Although the education system allowed for enhanced teaching of technical subjects at primary schools, it was more a rarity than a rule. Children with relationship towards technology since childhood, which connects their future to the craft,

In recent years, the choice of high schools has shown that interest in high schools on the part of parents and children was not based on examination. In this situation and with decreasing population, secondary vocational schools also accept students with low levels of knowledge, records, but also a significant lack of personal

discipline, which has a significant impact on the quality of education at the secondary vocational schools and also on knowledge and skill level of students.

Requirements of currently expanding automotive industry in the Slovak Republic and also other fields demand just the opposite, knowledge and work discipline of its employees.

In this regard there is a growing importance of quality of education process at primary schools. Secondary schools create an extension of education, which should take place to effectively evaluate the general knowledge and attitudes of students acquired at primary schools.
One of the main topics is a direct relevance of the interests of primary school pupils in studying at secondary vocational schools. The question is to what extent primary school graduates are prepared to study successfully at a vocational school.

6 Technical design and creativity fundamentals oftechnical education

One of the possible strategies for achieving the aim of increasing interest of pupils in learning is using of creative thinking in teaching of Technology.Nowadays, not only in the Slovak Republic, the trend in the educational approach where information is mediated and pupils learn the facts continues. This way of teaching of technology cannot meet the requirements even for the present nor for future at primary schools. Pupils in this system of teaching arenot able to formulate their own ideas, produce unconventional ideas and there isa risk that they will not be able to solve problems independently because their courage to find new solutions was not developed during school education, but rather repressed. Loadsmemory and does not teach the pupil to use creative thinking approaches One way how to attract the interest of students in this subject is mediating curriculum to students through acquired experience in everyday life. Everything that the teacher teaches is needed to relate to the pupils' experience. The teacher should emphasize the relevance of the curriculum, its originality, and use of teaching methods and resources that support pupils' learning experience.
The ability to solve problems creatively is a capability that is necessary for life and work experience. Human beings are characterized by creativity through all life. Each modern educational system should be designed in such a way that it creates space for improvement of individuals in the technical education and allows them to carry out their hobbies through school education

CONCLUSIONS

School teachers and professionals believe that the adoption of the proposed concept of technical education at primary schools in the Slovak Republic and applying of innovative content of educational standards starting with the school year 2015/2016 will present the beginning of a long-term conceptual development of a system of technical education not only at primary schools but also at secondary schools and universities.

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