In: Science and Technology Education ISBN: 978-1-53613-717-0
Editor: Steffen Pabst

Chapter 2

STRATEGY VERSUS REALITY IN TECHNOLOGY EDUCATION AT BASIC SCHOOLS IN SLOVAKIA

Alena Hašková[1*], PhD and Silvia Manduľáková[2], PhD
[1]Faculty of Education,
Constantine the Philosopher University, Nitra, Slovakia
[2]Eductech, Vranov nad Topľou, Slovakia

ABSTRACT

Technology has always constituted an important facet of culture. The progress of technology has influenced – even determined – the development of every type of society. This is why technology education represents, or at least should represent, an essential component of general education. This chapter presents on the one hand a synthesis report on the development strategies of technology education carried out at basic schools in Slovakia (lower secondary education – ISCED 2) and on the other hand the results of survey research aimed at revealing the practical reality of technology teaching at these schools (the approaches of students, teachers and school leaders to technology education; the status

[*] Corresponding Author Email: ahaskova@ukf.sk.

of subjects within technology education and their curricula; the creation of appropriate conditions for teaching technology education etc.).

The education policy of the European Union calls for the support of school development and the modernization and improvement in quality of education. In accordance with the policy of the EU, in their *Reports on the State of the Education System and Systematic Steps for its Development* successive Slovak governments have announced a national education policy and within that significant attention has also been paid to technology education at all levels of education. In the synthesis report, government announcements aimed at the support of technology education and steps adopted by government are analyzed, and the relevant benefits and costs are evaluated. Ultimately, despite some differences in the government announcements, each of them declares support for further development of vocational education and increasing students' interest in it (in accordance with labor market needs).

To discover the reality, i.e., to find out how education policy statements related to technology education and related legislation are reflected in practice, and to find out their impact on teaching practice at the lower level of secondary education, survey research was carried out. The research was based on semi-structured personal interviews with technology teachers working at basic schools, via a research sample in which all regions of Slovakia were represented. As the research results show, despite the proclaimed good intentions of the different strategies, programs and reforms, the reality is different – the most worrying finding is that the status of the subject of technology (by means of which technology education at basic schools is carried out) is on the decline. So the questions are: What are the reasons for this state of affairs? What should be done about it? What are the challenges for schools/decision makers resulting from this state of affairs?

1. TECHNOLOGY EDUCATION OF CHILDREN AND YOUTH

Technology has always constituted an important facet of culture. The progress of technology has influenced – even determined – the development of every type of society. Application of technological knowledge in practice represents a precondition for the prosperity of a society, and not only recent societies but also future ones. The principal initiators of any application of technological knowledge, innovation or change have always been, and for the foreseeable future will remain, human beings. This is why, apart from creative, educated people in

general, each society also needs creative, educated technicians and engineers. And this is why technology education has always been an integral part of school education, although in different types of societies and different countries this kind of education has been carried out in different ways. In some countries we can find it incorporated within the scope of the taught science subjects while in others we can find this education incorporated within the school curriculum as an independent school subject under different names.

The importance of technology education has been repeatedly stressed by UNESCO at sessions of its general conference as well as in its official documents and education strategies. Serving as an example of this fact is an extract from the UNESCO document *Recommendation Concerning Technical and Vocational Education*, adopted by the General Conference of 1962 and revised in 1974 (UNESCO, 1974):

> *An initiation to technology and to the world of work should be an essential component of general education without which this education is incomplete. An understanding of the technological facet of modern culture in both its positive and negative attributes, and an appreciation of work requiring practical skills should thereby be acquired. This initiation should further be a major concern in educational reform and change with a view to greater democratization of education. It should be a required element in the curriculum, beginning in primary education and continuing through the early years of secondary education*.

The content of technology education should comprise the study of various types of techniques and technologies with a stress on the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of commercial, economic and social life. Following the UNESCO proclamation, technology education should be understood primarily as an integral part of education, secondly as a means of preparing for employment, and last but not least as an aspect of continuing education.

Technology education at school gives students the opportunity to make sense of theoretical knowledge they have acquired and to recognize the coherence between the theoretical subjects taught at school and the

technical products surrounding them in their everyday lives. Technology education represents a field with a close interconnection with history, physics, biology, mathematics and many other disciplines. It gives students the opportunity to familiarize themselves with different occupational fields and to acquire broad knowledge and basic skills applicable in a number of occupations. The importance of technology education in evoking and influencing young people's interest in their prospective professional career is a reason to incorporate technology education into compulsory education as early as possible.

The society we live in currently is indisputably technology-based. In the context of a technology-based society one would logically expect science and technology education to be obligatory at primary and secondary schools, and students to be interested in continuing their career education in various technical study branches. But the contrary is true. For a long time the branches of science and technical or engineering study have been less favored disciplines and students have not been very interested in studying them (Lamanauskas, Gedrovics, Raipulis, 2004; Hus, Aberšek, 2007; Dopita, Grecmanová, 2008; OECD, 2010; Olsen, Lie, 2011).

The European Union is aware of the need to synchronize education with the social and cultural context of the reality we are living in. This is why it places considerable emphasis on technology education, as the social and cultural bases of education are strongly influenced by the rapid development of new technologies and the broad infiltration of information and communication technologies into each area of human life (EU, 2001; Králik, Tinley, 2017; Ambrozy, Valčo, Bhattarai, 2017). Reforms carried out by European countries in the context of the European Union recommendations and attempts to build a knowledge society should contribute to the reinforcement and improvement of the status of technology education in relation to the position of relevant school subjects within the curriculum as well as in relation to the young people's attitudes toward technology and science subjects. Unfortunately, it is not uncommon for changes introduced within the reforms to not function as intended; they have neither fulfilled expectations and nor have they brought about the intended improvement.

2. TECHNOLOGY EDUCATION AT BASIC SCHOOLS IN SLOVAKIA

In Slovakia, primary and lower secondary education (ISCED 1 and ISCED 2) is organized as a nine-year-long single-structure system, in which primary education lasts four years and lower secondary education lasts five years. Primary and lower secondary education takes place at so-called basic (elementary) schools, with nine grades, where children start to fulfil their compulsory school attendance at the age of six. A basic school consists of first and second stages. The first stage of a basic school is composed of grades 1 – 4 and the second is composed of grades 5 – 9.

Technology education has always been part of the general education provided at basic schools. Until 1948 it was carried out by means of training for manual work, which included work skills and mainly training in simple manual skills. In the form of the school subjects *work education* and *technical education*, taught in grades 1 – 4 (first stage of basic school) and 5 – 9 (second stage of basic school), it continued until 1997. After the year 1960 the freestanding school subject *work education* was taught with an allocation of one lesson per week in grades 1 – 3 and two lessons per week in grades 4 – 5. In grades 6 – 9 the lesson allocation was three lessons per week in each grade. But consequently (1960 – 1997) the lesson allocation was gradually decreased, finally to 60% (Lukáčová, Bánesz, 2007).

Under the influence of the former Soviet Union, which was a strong ideological role model for Central and East European countries in those times (the so-called Eastern or Communist Bloc as the Soviet Union and the aligned countries of the Warsaw Pact were named), high social status was prescribed to workers and a great emphasis was placed upon manual workers in particular. Consequently, great attention at basic schools was paid to preparation of students for manual trades.

After the political changes in 1989 (the so-called Velvet Revolution in Czechoslovakia in 1989; the dissolution of Czechoslovakia into two separate independent states, the Czech Republic and Slovakia, in 1993) humanization of education become a dominant priority of the national

education system. Decentralization and humanization of the education system were accompanied by an emphasis on foreign-language teaching, while technology education became unattractive and surplus to requirements. An erosion in social awareness of the importance of the basic principles of technology for both society as well as human life resulted in an environment in which:

- subjects relevant to technology education (*work education* and *technical education*) at basic schools were taught increasingly by unqualified teachers (teachers specializing in other subjects);
- very often teaching subjects relevant to technology education did not follow their curricula;
- financial and material support of the subjects was reduced step by step;
- young people's interest in technical fields of study and employment and technical professions decreased significantly.

Due to the various problems in the system of education which had led to the aforementioned state of affairs, a changed approach in relation to technology education appeared in 1997. From this year, at least a formal declarations of the necessity to support technology education and to develop the technological literacy of children and youth have been formulated by relevant public bodies.

Paradoxically, just at the time when in Slovakia technology education was being neglected, in most European countries it was being significantly reinforced in the shape of different educational reforms. One of the most significant initiatives has been the *Recommendation of the European Parliament and the Council on Key Competences for Lifelong Learning* (EP, 2006). In this document basic competences in science and technology are included among eight so-called key competences, i.e., competences which all individuals need in order to succeed in a knowledge society, for their personal fulfilment and development, and for active citizenship, social inclusion and employment. Competence in technology is viewed as the application of knowledge and methodologies in response to perceived

human wants or needs, including understanding changes caused by human activities and the related responsibility of each person (citizen) for these changes. Based on the fact that "competence" is understood as a construct consisting of relevant knowledge, skills and attitudes, competence in technology should comprise:

- knowledge of the basic principles of the natural world; fundamental scientific concepts, principles and methods; technology and technological products and processes;
- understanding of the impact of science and technology on the natural world; advances, limitations and risks of scientific theories; applications of technology in societies at large (in relation to decision-making, values, moral questions, culture, etc.);
- skills in using and handling technological tools and machines as well as scientific data to achieve a goal or to reach an evidence-based decision or conclusion; the ability to recognize the essential features of scientific inquiry and communicate the conclusions and reasoning that led to them;
- an attitude of critical appreciation and curiosity, an interest in ethical issues and respect for both safety and sustainability (in particular as regards scientific and technological progress in relation to oneself, family, community and global issues).

The incorporation of competences in science and technology among the key competences proclaimed by the European Parliament resulted from social needs and actual developments in science and technology. It might be assumed that these social needs and developments in science and technology would also have created a supportive environment for the social acceptance of the value of technology in Slovakia and that this would result in the reinforcement of technology education at schools, including basic schools (as a precondition for the creation of conditions for sustainable industrial and economical social development). But the Slovak reality was different (Hašková, 2015; Hašková, Dvorjaková, 2016; Hašková, Manduľáková, Van Merode, 2017).

Before 1996, the subject *work education* was taught with a lesson allocation of two lessons per week at each grade of the second stage of basic school (equivalent to lower secondary education – ISCED 2). The content of the subject consisted of three independent parts, which were technical education, agricultural work and family education. This state of affairs changed twice, first in 1996 and secondly in 2008. The first change consisted of renaming the subject *work education* to *technical education* and the number of lessons allocated to it was decreased from two lessons per week to one lesson per week, still in each grade of lower secondary education. The next change was performed within the curriculum reform that came into operation through enactment of the new Law on Education in 2008 (Law No. 245/2008).

The most significant feature of the curriculum reform in 2008 was the introduction of the so-called State Education Program and School Education Programs. Via the reform, the government guarantees basic education by means of the State Education Program which is compulsory for all basic (primary) and secondary schools. Based on the State Education Program, schools create their own School Education Programs. A School Education Program consists of the compulsory State Education Program plus optional school subjects which constitute approximately 30% of teaching time, according to the needs of the school or region, or requirements of the students and their parents. These lessons do not need to be devoted to new optional school subjects as they can also be used to enhance teaching of some of the compulsory subjects included in the State Education Program. Another change brought about by the reform, connected with the form and structure of the newly created education programs, was the definition of educational areas for each level of education. As regards technology education, the previously mentioned school subject *technical education* was renamed *technology* and was incorporated into the educational area *Man and the World of Work* consisting of three subjects: *manual training* (the first stage of basic school), *world of work* and *technology* (the second stage of a basic school):

- *manual training* 4th grade – 1 lesson per week
- *world of work* 7th grade – 0.5 lesson per week
  8th grade – 0.5 lesson per week
- *technology* 7th grade – 0.5 lesson per week
  8th grade – 0.5 lesson per week

This means that the lesson allocation for technology education (subject *technology*) was cut from 1 lesson per week to only a half of a lesson per week taught only in the 7th and 8th grades, or the school could determine the grade in which the subject was taught (ŠVP ISCED 1, 2008; ŠVP ISCED 2, 2008; ŠPÚ, 2008).

Legislatively prescribed changes started to be introduced into practice at the beginning of the academic year 2008/2009 and were completed in 2012/2013, when the teaching process in all grades 5 – 9 was already being carried out in accordance with the new School Education Program.

In practice, implementation of the curriculum reform was accompanied by strong criticism (Hašková, Bánesz, 2015), and not only in relation to the reform of technical education but also in relation to other school subjects. Calls for a systematic solution to the reform's failings resulted in the introduction of a readjustment of the State Education Program. A new, innovated State Education Program entered into force in September 2015 (ŠPÚ, 2015). Positive aspects of the new innovated State Education Program have brought significant improvement to technology teaching and its position at schools. In accordance with the innovated State Education Program, technology is taught currently one lesson per week in all grades (5 – 9) at the second stage of basic school. Moreover, there was also elaborated a system of standards for the particular grades.

According to the new Innovated State Education Program (ŠPÚ, 2015) the purpose of the subject technology is to guide students toward acquisition of basic skills and competences in different labor-related activities, to contribute to students' deeper understanding of the various jobs and professions connected with the subject of technology, to lead to their familiarization with the labor market and ultimately to the development of students' life and professional orientation.

The content of the subject is based on specific life situations in which people come into direct contact with human activity and technology in its diverse forms and wider contexts and, through technical achievements, protect the world and their cultural heritage. The concept of the subject is based on the practical activities of students. The subject is focused on skills and habits useful for students' future lives in society, using creative thinking and co-operation among students.

The content of the subject matter is intended for all students regardless of gender. Students learn to work with different materials and devices, acquire basic working skills and habits, and develop creative technical thinking. When developing the designs and creation processes of products, they combine practical skills with creative thinking. The subject enriches the basic education of students with an important component laying the foundations of the field of technology that are indispensable for further study and the functioning of people in real life. Students learn to plan, organize and evaluate their work independently and also in a group. They are guided to adhere to the principles of safety and hygiene at work. Depending on the age of the students, a system is developed that provides students with important information from the world of work and helps them to make responsible decisions about their future professional orientation and decision-making in life.

The basic tasks of the subject technology (ŠPÚ, 2015) include:

- teach students to distinguish and safely use natural and technical materials, tools, and equipment;
- teach students to adhere to established rules and to adapt to altered or new tasks and working conditions;
- teach students to experiment with ideas, materials, technologies, and techniques;
- form suitable and appropriate habits of students for family life;
- develop students' sense of responsibility for their health, interpersonal relations and finances as well as for the convenience and security of their immediate surroundings and environment;

- develop students' sense of responsibility for the quality of their own and their joint work output;
- develop students' basic working skills and habits in different work-related areas;
- teach students how to plan and organize their work and use appropriate tools, instruments and aids at work, and in everyday life;
- lead students to perform their basic tasks persistently and consistently, apply creativity and their own ideas in their work and efforts to achieve quality results;
- form students' basic attitudes and values in relation to work and the environment;
- develop students' perception of work and work activities as opportunities for self-realization, self-actualization and the development of entrepreneurial thinking;
- teach students to orient themselves in different fields of human activity and forms of physical and mental work;
- develop students' knowledge and skills necessary for their employment, choice of professional career and further professional and life orientation.

The above-mentioned tasks clearly point to the fact that the subject of technology is characterized by significant specificities compared to other general subjects taught at basic school. The specifics of technology relate mainly to its focus on the practical activities of students and development of their manual skills. In order for the subject to fulfill its mission, it is necessary for schools to have specially equipped classrooms – school workrooms designed for the practical teaching of technology. The essence of the work in school workrooms is to teach students how to handle and work with different tools, devices and various types of materials, develop their skills in this direction, teach them to adhere to work habits and work safety and lead them to designing and making their own products, both on their own and in group work (Serafín et al., 2016; Valentová – Brečka, 2017).

3. Role of Technology Education in National Education Policy

Following a statutory order of the National Council of the Slovak Republic (parliament), the government of the Slovak Republic was obliged before the end of March 2013 to elaborate an *Activity Status Report on the Education System and Systematic Steps for its Development*. This document was commissioned to grant the Slovak education system a vision of its long-term development and a conception of the relevant systematic steps toward that development. Although then minister of education Dušan Čaplovič (4. 4. 2012 – 3. 7. 2014), an antecessor of ministers of education Peter Pellegrini (4. 6. 2014 – 25. 11. 2014), Juraj Draxler (26. 11. 2014 – 23. 3. 2016), Peter Plavčan (23. 3. 2016 – 31. 08. 2017), Gabriela Matečná (1. 9. 2017 – 12. 9. 2017) and the current incumbent Martina Lúbyová (13. 9. 2017), had prepared the first draft of this document and submitted it for consultation and in September 2013, after incorporation of recommendations resulting from the consultation, submitted a final draft to the government for interdepartmental consideration (MŠVVaŠ SR, 2013), the report has never been put into the schedule for government discussion.

The document has not been submitted to the government despite a request submitted by the signatories of the *Declaration of the Trade Union of Workers in Education and Science of Slovakia*, an independent, apolitical and non-profit organization established in accordance with Law No. 83/1990 on the Association of Citizens (OZ PŠaV, 2016) and Stakeholders in Education to Support the Quality of Education and Science in Slovakia (OZ PŠaV, 2016). The signatories of the declaration even before the parliamentary election held in March 2016 had asked all political parties standing as candidates for the National Council of the Slovak Republic (as Slovakia's parliament has been called since 1992; NR SR, 1996; NR SR, 2018) to promise that before the end of the year 2016, in co-operation with the stakeholder institutions, they would prepare and authorize a *National Strategy for the Development of Education and Training*, which would be based on the *Activity Status Report on the*

Education System and Systematic Steps for its Development (MŠVVaŠ SR, 2013).

As a fulfilment of this requirement one can cite a document called the *National Development Program of Education and Training "Learning Slovakia"* submitted for consultation by the previous minister of education Peter Plavčan in October 2016 (MŠVVaŠ SR, 2016). The document, elaborated by a group of experts nominated by the Ministry of Education, Science, Research and Sport of the Slovak Republic, described the framing of a program of changes planned by the ministry to be achieved within the scope of a long-term, 10-year timeframe. According to this document, the main goal of education and training was to be a balanced fulfilment of the needs and demands of individuals and society. Its authors mentioned that Slovakia had not yet responded adequately to the challenge of the transition from an industrial to information society as well as to the impact of new technologies on the need for new skills. In the manufacturing sphere, traditional skills, tools and machining techniques have retreated in the face of new requirements in terms of digitization, automation and the growing importance of additive manufacturing. However, this has not been reflected adequately in the vocational training offered by the regional education system. For this reason vocational education and training in Slovakia has become the subject of serious and increasing criticism for a prolonged period of time. Dissatisfaction has mainly been related to the insufficient level of practical technical training, which has resulted from the insufficient and out-of-date material and technical equipment of secondary vocational schools. Within this context the authors of the national program *Learning Slovakia* have emphasized the need to analyze the expected impact of the information society on the required knowledge, skills, abilities, attitudes and workforce habits relevant in the context of the Slovak Republic, and the need to recognize specific skills and competences which can be applicable more widely in different jobs and positions, with respect to changing conditions in the near future. The stated goal of increasing the proportion of training carried out in a manufacturing environment by means of dual education and forming agreements between

schools and employers can be understood as a strategy for addressing the content of technology education in schools.

The conceptual framework of the national program addresses only the need for interconnection of vocational education and training provided by secondary vocational schools (ISCED 3) with the needs and requirements of employers and practice. The need to promote the interconnection of vocational technology education carried out at the lower level of secondary education (ISCED 2) with technology education carried out at elementary (basic) schools, and the need to analyze possible necessary changes in the content of technology education in basic school, is not mentioned. Partially this could be a result of the fact that in 2013 (only three years before the design of the national program *Learning Slovakia*) the curriculum reform of basic schools was completed and the authors of the national program had not dealt with the curriculum issue. This problem is pointed out also by Miron Zelina (2016), the co-author of previous school reforms. Evaluating the conception of the national program *Learning Slovakia* he draws attention to the fact that in the document no goals in terms of changing education content are mentioned, and this refers to changes in the content of education in general, not specifically the content of technology education. Furthermore, in his opinion the submitted document lacks any information on why similar intentions of previous reform proposals had not been implemented or why they had not had the expected positive impact on practice.

From our point of view a weakness in the presented conception is also the absence of any comprehensive description of the current state of the system of education and from it resulting identification of the most serious problems. In this regard the *Activity Status Report on the Education System and Systematic Steps for its Development* (MŠVVaŠ SR, 2013) had been considerably more specific. The Activity Status Report also drew attention to the deepening youth interest in vocational education and training, accompanied or even strengthened by the reduced number of lessons of practical education at lower secondary education (i.e., in the case of Slovakia at basic schools). In relation to the curriculum reform (2008 – 2013) it drew attention to the fact that the introduction of School Education

Programs designed at the level of each school should contribute to increasing students' preparedness for real life, including enhancing their employability in the labor market (as the School Education Programs should take into consideration the specific needs of a particular school, derived from the parents' requirements and needs of local employers, as well as from the interests of the students and other stakeholders), but in practice their creation faced a lot of problems. Redistribution of curriculum design (specification of education content) from the national to the school level was not carried out consistently and schools only took partial advantage of their new autonomy and responsibility. To a great degree it was a consequence of the insufficient resources and technical equipment of schools, a lack of didactic teaching materials and finances, problems with assurance of teaching by qualified teachers as well as weak construction and clarification of the strategic intention and purposes of the curriculum reform and absence of teacher training targeted at the development of the skills necessary to design curricula and elaborate School Education Programs.

As a strategic aim for the development of regional education the *Activity Status Report on the Education System and Systematic Steps for its Development* announced a sufficiently funded and effectively functioning system of regional schools, available to all social classes and providing quality education and training responding to current and anticipated needs of practice. Quality education assurance was linked to several pillars, among which the two most important were quality of teachers and content of education.

In the context of the discussed issue, the most important strategic goals included in the systematic steps for the development of the education system were the intention to support further development of regional education and the intention to take measures to support the interest of basic school students in vocational training in accordance with labor market needs.

Analyzing both documents (the national program *Learning Slovakia*, MŠVVaŠ SR, 2016; Activity Status Report, MŠVVaŠ SR, 2013), we agree with Pupala's view (2016) which considers the methodology of the

conception of the national program *Learning Slovakia* to be questionable because (unlike the Activity Status Report) the program presents goals stated for the education sphere but it does not mentioned neither indicate how these goals should be reached. Moreover there are specified no basic contexts following of which settings of the stated goals was done.

4. THE REALITY OF TECHNOLOGY EDUCATION IN PRACTICE

4.1. Purpose of Research

The education policy of the European Union calls for the support of school development, and the modernization and improvement in quality of education. In accordance with the policy of the EU, in its *Reports on the State of the Education System and Systematic Steps for its Development* each Slovak government has announced a national education policy and within it significant attention has been paid also to technology education at all levels of education. Despite some differences in the government announcements, each of them has declared support for further development of vocational education and increasing pupils and students' interest in it, in accordance with labor market needs.

To find out the reality, i.e., to find out how the education policy announcements related to technical education and relevant legislation have been reflected in practice, and in particular to find out their impact on teaching practice at basic schools (lower level of secondary education) field research was carried out. The research was based on semi-structured personal interviews with technology teachers working at basic schools in a research sample of which all regions of Slovakia were represented. As the research results show, despite the proclaimed good intentions of the different national strategies, programs and reforms, the reality is different.

4.2. Methodology

In education and sociological research, survey research is a frequently used method (Fraenkel, Wallen, 1993; Jaeger, 1988). In survey research information is gathered through asking questions. Answers to these questions given by a broader research sample of respondents constitute the research data of the consequent research study whose goal is to reveal certain attributes of a studied issue. This means that in survey research a broader group of people is asked about their opinions, attitudes, beliefs, knowledge and experiences regarding the issues under investigation. To allow respondents to express their opinions, attitudes, beliefs, knowledge and experiences freely, the questions should be formulated in a broader, more general way, not too specific or guiding respondents to some particular answers. An alternative strategy for defining survey questions is to use a hierarchical approach, i.e., to begin with the broadest, most general questions and to end with the most specific ones.

The main question of our research was which topics (thematic units) should be included in the curriculum of the school subject technology taught at basic schools in Slovakia (according to ISCED, this means the lower level of secondary education and in the Slovak context, the second stage of basic education) to ensure fulfilment of its mission and not to suppress in practice its meaningfulness and value in the formation of students' attitudes to work, i.e., formation of students' choice of their future professional career (Pavelka, 2016; Avsec, Jamsec, 2016; Fujikawa, Maesako, 2015). A subsequent research question asked how the curriculum reform came up with the fulfilment of the subject mission. To find answers to these questions meant:

1. identifying redundant topics (thematic units) taught within the technology subject curriculum;
2. identifying topics (thematic units) relevant to the subject technology, supporting its mission (i.e., to approve the curricular attributes of the subject);

3. assessing the impact of the curriculum reform on the subject's teaching, i.e., on its curriculum and forms of its realization.

Taking into consideration that the intention of the survey research was to focus on a deeper qualitative analysis of the issue under study (Bogdan, Biklen, 1992), questioning by means of personal interviews was used (Seidman, 1991).

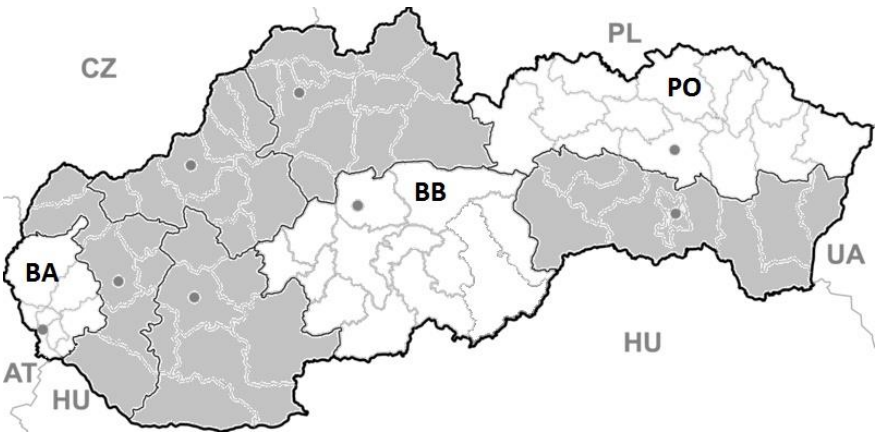

Figure 1. Regions where personal interviews were carried out (BA – Bratislava region, BB – Banská Bystrica region, PO – Prešov region, AT – Austria, CZ – Czech Republic, HU – Hungary, PL – Poland, UA – Ukraine).

The target group of the questioning comprised technology teachers. In order to obtain objective answers to questions aimed at curricular aspects and forms of teaching the subject technology before and after the curriculum reform (before the curriculum reform the school subject was named *technical education*; after the reform the school subject was *technology*), there was a requirement for the interviewees to have been in teaching practice for a longer period of time.

As the results of pilot research focused on schools' attitudes towards technology teaching and the prominence given to this subject at basic schools – carried out by Manduľáková (2016) – showed significant differences among particular regions of Slovakia, it was necessary to include in the research sample technology teachers from all regions of

Slovakia. With respect to the difficulties of using personal interviews, it was problematic to bring together a research sample of teachers that would be representative of the whole of Slovakia and also difficult for the research group to travel around the whole country. The final solution was to carry out personal interviews with groups (representative research samples) of teachers from three regions of Slovakia, in particular these were regions of Bratislava (BA), Banská Bystrica (BB) and Prešov (PO), representing the west, center and east of the country (Figure 1). A description of the research sample is presented in Table 1.

Table 1. Numbers of teachers interviewed per region

	Region			Total
	Bratislava	Banská Bystrica	Prešov	
Number of teachers	26	20	24	70
- male	9	4	8	21
- female	17	16	16	49
Practice > 10 years	5	4	2	11
Practice > 20 years	21	16	22	59

As Table 1 shows, in total 70 semi-structured interviews were carried out. In these interviews teachers expressed their opinions and experiences related to:

- changes in realization of technical education at their schools caused by the curriculum reform (i.e., changes between teaching the school subject *technology education* before the reform and teaching the school subject *technology* after the reform);
- ideal state of technology teaching (what the teachers imagine under "an ideal state" as regards teaching; how and under what conditions would they like to teach it);
- further necessary changes (following the curriculum reform what the teachers consider to be necessary to do furthermore in relation to teaching technology; what changes should be made), or from

their point of view which further changes would enhance the quality of technology teaching at their school;

- curricular aspects of the subject technology (what should and what should not be incorporated into the curriculum of the subject technology).

Data from the interviews consequently underwent a qualitative analysis, focusing on the frequency of content units and categories and their intensity.

4.3. Research Results and Discussion

The results of the qualitative analysis of the personal interviews were processed separately for each group of respondents, i.e., separately for groups of teachers in-service in the particular regions of Bratislava, Banská Bystrica and Prešov.

Survey Results – Bratislava Region

Teachers in the Bratislava region coincide in their opinion that the technology curriculum should be focused first and foremost on the thematic units of technical materials and machining. As a reason, they assert that this knowledge is as an integral part of general technical education. Most serious reservations related to a lack of respect for cross-curricular relationships, which occurs in both State Education Programs as well as in School Education Programs. A frequently cited example of this phenomenon was the incorporation of the thematic unit Electro-technology into the education programs (a difference of two grades: in the subject technology this thematic unit is taught in the 6th grade, while in physics it is taught in the 9th grade of basic school). But teachers in general hold the view that teaching and managing electro-technology is significantly difficult and demanding for an age group comprising basic school students. Further there is a consensus that thematic units dealing with financial literacy of students should move from technology to math, and thematic

units dealing with computer literacy (how to use and work with ICT) should be moved to the subject information technology (informatics). To ensure the adequate quality of technical education for youths, the teachers called for the involvement of secondary school teachers (ISCED 3) in discussions on curricula for basic schools.

A general consensus among the interviewees was also recorded as regards the form of teaching technology. The teachers stated that subject matter content is very demanding to prepare both in terms of teaching activities, relevant materials and technical equipment. But at the same time the teachers declared their belief that each topic should be taught in a practical way, and more demanding thematic units should be accompanied by excursions.

An interesting result of the survey was a finding that arose in the discussion on what was the ideal way to teach technology; the teachers did not mention thematic units or topics which should be (or should not be) taught. What they mentioned was simply the provision of resources and technical conditions appropriate to practical activities which should be used in teaching technology. In our opinion this finding does not prove teachers' contentment with the curricula of the subject. Altogether, some measure of their discontent is proved by the above-mentioned comments and remarks as regards the education programs. What it is evidence of is the insufficient standard of school facilities to provide opportunities for teaching technology predominantly in a practical way, which means the idealized goals of teaching this subject become deformed in practice. A result of this state of affairs was that the interviewees, on being asked to present their visions of the ideal way of teaching technology, dealt at first with the issue of ideal conditions to ensure practical forms of teaching. They dealt with necessary premises for technology teaching (specialized classrooms, workrooms), required equipment (technical kits, tools and devices, technical apparatuses, materials necessary to make various products), an efficient funding model to ensure materials necessary for practical activities which should be carried out in teaching particular topics, and a need to improve in general the very low status of the subject (especially when regarding it in the context of other school subjects, and

when regarding the unstable position of the subject in the State Education Program, and the underestimation of the importance of the subject by parents).

In assessing the curriculum reform, the interviewees very often expressed the opinion that the reform was not prepared sufficiently. From their point of view the reform should have started with the creation of the necessary conditions for its realization. To these conditions they include mainly the furnishing of specialized classrooms for technology teaching (workrooms) and ensuring of materials necessary for practical activities (this is in accordance with their vision of the ideal form of technology teaching). After this teacher in-service training was to be carried out, and only then were curricular changes to be implemented into practice. Within the context of teacher training for the implementation of new curricula, the respondents expressed very critical views also as to the familiarization of teachers with the intentions of curriculum reform. It was not an isolated opinion that many teachers had not yet grasped the main intention of the reform. Interesting opinions were stated also in the context of the assessment of the current state of technology teaching, such as statements in which the teachers characterized the technology teaching process as unstable (not in general, only particularly in relation to schools at which they taught). Although the teachers assessed the repeated increase of the compulsory number of technology lessons positively (Innovated State Education Program valid from September 1, 2015; ŠPÚ, 2015), they drew attention to the fact that until the spatial, material and technical conditions of teaching the subject improved at schools, no adequate quality of its teaching could be expected (regardless of the lessons allocated per week to this subject or particular topics included in its curriculum) and at the same time no adequate quality of students' technical skills could be expected, either. The teachers would have been pleased if the Ministry had realized the introduction of the changes on the basis of closer communication and co-operation with schools.

Survey Results – Banská Bystrica Region

Teachers in the Banská Bystrica region, similarly to the teachers in the Bratislava region, assessed the incorporation of thematic units focused on technical materials into the State Education Program in a positive way and had reservations about the thematic unit Electro-technology. Most serious reservations were about the incorporation of the theme of logical circuits into the curriculum. Teachers suggest that this be removed from the State Education Program. In regard to cross-curricular interaction of the subject technology with physics, the teachers drew attention to the incoherence and uselessness of some of the topics, and also in the case of electro-technology to its difficulty for students.

A paradoxical finding is that in the teachers' view no further major changes are necessary, despite the fact that the changes already performed are considered to be uncoordinated and ignoring of teachers' opinions. If some changes are to be made, the teachers consider it would be beneficial and efficient not to support changes in the curriculum but to support the content of the course together with the provision of proper resources and technical conditions (equipment) necessary for its teaching at schools.

In accordance with the results of the inquiry performed in the Bratislava region, at the question of the ideal form of technology teaching also the interviewees in the Banská Bystrica region in their responses to this question declared as a priority the need to ensure adequate conditions for technology teaching so that its focus would be on the practical activities of students and not on theoretical forms of teaching the subject.

Contrary to the Bratislava region, the teachers in the Banská Bystrica region:

- stressed very specifically the need to develop students' manual skills in the context of different practical activities;
- called more strongly for methodological support for teachers;
- linked their requirement to stabilize the subject with a particular requirement to assign technology as a compulsory subject in all grades 6 – 9 with the allocation of two lessons per week in each grade;

- in relation to the ideal form of teaching technology stated also the availability of textbooks of high quality written for particular grades (instead of the one elaborated for all grades, as has been done, whose quality is in their opinion unsatisfactory).

In their assessment of the impact of the curriculum reform on the realization of technical education at basic schools the teachers in the Banská Bystrica region also didn't focus on curricular aspects but in a very spontaneous way commented predominantly on the conditions of teaching the subject. They pointed to the fact that due to the reform conditions had become notably worse, as the reform and the State Education Program introduced in 2008 (ŠVP ISCED 1, 2008; ŠVP ISCED 2, 2008; ŠPÚ, 2008) prescribed cuts to the minimum compulsory lesson allocation of technology teaching, and together with financial reasons, led the school heads of many basic schools to make the decision to liquidate established equipped workrooms and to use these rooms for other purposes (mainly for teaching information technology and foreign languages).

Content analysis of the teachers' statements following the content category of space and material conditions for technology teaching detected two aspects related to teaching technology. Although insufficient (or even absent) ensuring of appropriate space, material and technical conditions for technology teaching obstructs the work of teachers and logically decreases the quality of the technical education provided by schools to students, this cannot be considered the cause of technology's low status. From the interviewees' point of view, the low status of technology results from the minute "juggling" of the subject within the system of general education subjects and from the many who question the need for this subject as a compulsory one at basic school, and the associated low social support given to this subject. In many cases the teachers drew attention to the fact that this perception of the subject's status is consequently reflected in attitudes and mainly decisions of the school leadership (or it significantly influences their attitudes and decisions). Half of the interviewed respondents in the Banská Bystrica region linked the subject's status directly to the school leadership.

From the point of view of subject status and its social perception, the teachers clearly considered the situation to have been more favorable before the curricular reform.

Survey Results – Prešov Region

Although the results of the interviews performed in the Banská Bystrica region led to some differences in comparison with the results obtained for the Bratislava region, in the Prešov region the differences with the other regions were even more marked.

Results of the interviews in the Prešov region, analogous to the results obtained in the Bratislava and Banská Bystrica regions, again point to the controversial insertion of the thematic unit Electro-technology into the technology curriculum. A particularity of this region was the very strong requirement of the respondents to focus the content of the technology curriculum on development of practical activities in the handicrafts area. The respondents evaluated the currently taught thematic units as irrationally sequenced and moreover very difficult for students of that age (mainly the above-mentioned Electro-technology mentioned by all three regions; besides the call to exclude this unit from the technology curriculum there were also calls to relocate it to the physics curriculum). With difficult topics students very often experience feelings of failure and frustration, and in the teachers' opinions technology should be mainly about experiences.

Technology teachers assess their workload in technology lessons as higher than the workload of other subject teachers (including their own workload when teaching a subject apart from technology). With regard to topics which require practical activities, to complete the course of a technology lesson is more difficult in terms of time, materials and methodologically. This is why they propose teaching technology in smaller groups of students.

A further particularity of the Prešov region was that at the same time as the call to divide classes into smaller groups of students for technology, there were also calls to separate boys and girls or to introduce into the

technology curriculum topics that should be taught separately for girls and boys.

As in the case of the two other regions, respondents in the Prešov region connected the ideal form of technology teaching with creating and ensuring "ideal" conditions for its teaching – with modernization of school facilities, equipment of schools with appropriate materials, tools, devices and teaching aids, establishment of storage rooms besides workrooms, establishment of specialized classrooms equipped with computers (ICT), provision of proper teaching materials and in-service teacher training (continuing education opportunities), and an increase in the number of compulsory lessons of technology at particular grades of basic school (in many cases two lessons per week was stated as an ideal number).

It is disputable to which extent some of the respondents' remarks were objective (e.g., in descriptions of the ideal form of technology teaching). It might be that some subjective feelings of "discrimination" in comparison with the other regions (or in particular with the Bratislava region) could be felt (respondents had no cognizance of the selection of the regions in which the survey research was carried out, i.e., the comments were based on respondents' general feelings and were not influenced by disclosure of said information).

While the respondents in the Bratislava and Banská Bystrica regions evaluated the impact of the curriculum reform on technology education carried out at basic schools in general in a negative way, teachers from the Prešov region considered the situation as more or less unaffected. However at this point it is necessary to warn that "unaffected" means that from the teachers' point of view the reform did not bring any significant (either positive or negative) changes and "everything is carrying on as before". But "everything is carrying on as before" means a continuation of the negative development of the realization of technology education at schools, which the reform failed to stop and has not reversed yet (i.e., the reform did not stop a falling-off in technology teaching conditions and these are continually getting worse as they had been getting worse before the reform). In this context the respondents expressed their apprehension of the further development of the position of technology within the education

programs as well as of the further development of technology education at basic schools. On the one hand the respondents consider the reality of technology teaching at schools to be out of step with the labor market, but on the other hand they appreciate at least the effort to improve something, e.g., the innovation of the State Education Program introduced from 1 September 2015 (ŠPÚ, 2015).

As the factor analysis shows the most marked recorded differences between the Bratislava and Prešov regions in relation to the subject of technology are as follows:

- higher criticism and almost rejection of the subject recorded in the Bratislava region; in the Prešov region significantly higher acceptance of the subject;
- although teachers in both regions approach the subject critically (with regard to insufficient resources for its teaching and a lack of material and technical equipment at schools), schools in the Bratislava region (basic schools in general, including their leaders, not only technology teachers) do not feel any greater need to change this situation, they would rather place emphasis on foreign language teaching – by contrast teachers in the Prešov region are characterized by a strong will to cope with the low status and poor conditions of technology teaching and, despite them, teach the subject in a way that might be as interesting, attractive and beneficial for students as possible, and which would offer the students as many opportunities for practical activities as possible;
- in the Bratislava region technology was primarily considered a supplementary subject which although in the past had a justification and was important (because of the manual and technical skills acquired), nowadays it has lost this justification (technology is understood as an additional subject offered to students simply to increase their morale in the context of other more theoretical subjects); in the Prešov region despite the unfavorable conditions the teachers exercise greater care and

diligence in teaching the subject to an adequate level, as they want to give their students a practical chance in the labor market;

- a tendency of parents to call into question the status of technology and its relevance was significantly the highest in the Bratislava region where the parents very often assumed a negative attitude towards the expectation of the school that their child will perform some manual activities, as they expect their child will be a lawyer, doctor or manager.

To illustrate the above-mentioned, we choose several examples from the responses of the respondents from the Bratislava region:

- *It is necessary to set the State Education Program in a different way. Technology does not fulfill the purpose (mission) of the subject.*
- *It is a question whether it is worth teaching this subject at all.*
- *I consider the subject overall as a negative.*
- *Technology should only be an optional subject.*
- *The subject should be restful, relaxing.*
- *Why should we produce something? We in Bratislava can buy everything at the Chinese supermarket for one euro. Let the others elsewhere learn technical skills and handicrafts; here in the capital it doesn't make sense. Technology should explicitly only be an optional subject.*

CONCLUSION OF SURVEY RESEARCH IN THE CONTEXT OF LABOR MARKET NEEDS AND REQUIREMENTS

The adaptation of educational institutions to the demands of their "customers" means adapting what they offer them not at the output stage but at the input stage. Adaptation of schools to the demands of their "customers" means that schools are logically amenable to their customers' demands for education services (or to the preferences their customers have

– the notion "school customers" covers in general both students and their parents). Unfortunately, it does not mean that schools are amenable to the requirements of the potential employers of their graduates. Schools' strategies are largely determined by their system of funding, in the context of which the quality of school graduates is not critical to school budgets. What is critical for school budgets are the numbers of students enrolled in schools (i.e., not the quality of their graduates but quantity of enrolled applicants) and meeting the preferences of students and their parents for particular study programs but not the preferences of potential employers of graduates. Paradoxically, a school strategy of ensuring graduate quality could create an existential problem for a school. These facts were reflected to a great extent in the interviews carried out with technology teachers teaching at basic schools, regardless of the region they teach in. When considering the transition of basic school students to higher secondary schools, many interviewees mentioned the fact that students' parents have often framed their own vision of their child's future and do not want to be advised on the choice of the right secondary school or higher education institution for their child. More than a half of the respondents directly stated that the parent is the decision-maker and that parents' significantly prefer grammar schools. However very often this preference does not follow any logical or rational reason, but instead such reasons as "if s/he is accepted, let s/he has a better education" are given. And the practice is such that usually children are accepted independently of their knowledge, skills and previous school achievements.

- *Today's children have obscured moral and ethical values. They like and want to work manually, but only for some reward. I think this is the influence of their parents.*
- *The current trend is that students apply predominantly for grammar schools and business academies. But these are not decisions of students according to the school but according to their parents' wishes.*
- *Parents make decisions. I feel sorry for children who study something they do not like.*

- *Unfortunately, students graded 4* (sufficient, in a 5-grade scale with 5 meaning unsatisfactory) *are usually accepted to study at grammar school.*
- *Currently it is a trend: grade 4 students also attend grammar schools! Everybody wants to be very smart!*

Besides the aforementioned general decrease in the status of technology, parents significantly contribute to the degradation of the structure of the school system in Slovakia (Vantuch, 2015). The professional focus of higher secondary schools in all regions is unsystematically adapted to the preferences, interests, requirements and needs of parents. Due to this fact the network of secondary vocational schools does not correspond to the economic needs of the particular regions and to the requirements of the regional labor market and employers acting in it. In this context a surplus of students at non-technical (non-vocational) higher secondary schools is increased markedly by the growth of the capacities of art schools and private schools, which are predominantly focused on arts and non-technical study programs.

Ensuring a labor-force structure corresponding in each region to labor market needs is a very difficult task and is definitely not simply a problem of education (of the regional education system). Schools simply create their development strategies following the demands of their customers and the customers' preferred study programs. It is a question how, within the declared national education policies to adapt the regional structures of schools to the needs and requirements of the regional labor markets, to force citizens to respect the regional labor market's needs taking into consideration their further professional orientation (Tomková, 2010; Lukáčová, 2014).

REFERENCES

Ambrozy, M., Valčo, M., Bhattarai, S. (2017). The Ethical Aspect of Scientific Interest in Selected Physical Theories. *Communications - Scientific Letters of the University of Žilina*, 4(19), 2017, pp. 79-84.

Avsec, S., Jamsec, J. (2016). Technological Literacy for Students Aged 6 – 18: a New Method for Holistic Measuring of Knowledge, Capabilities, Critical Thinking and Decision-Making. *International Journal of Technology and Design Education*, 1(26), 2016, pp. 43 – 60.

Bogdan, R. G., Biklen, S. K. (1992). *Qualitative Research for Education*. Boston, Allyn & Bacon, 1992.

Dopita, M., Grecmanová, H. (2008). Secondary school students and interest in natural sciences. *e-Pedagogium*, 8(4), 2008, pp. 31–46.

EU (2001). *Report from the Commission of 31 January 2001: The concrete future objectives of education systems*. Available from: http://europa.eu/legislation_summaries/education_training_youth/general_framework/c11049_en.htm.

EP (2006). Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning. *Official Journal of the European Union*, 2006/962EC, L 394, pp. 10-19. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006H0962&from=EN.

Fraenkel. J. R., Wallen, N. E. (1993). *How to Design and Evaluate Research in Education*. USA: McGraw-Hill, Inc., 1993.

Fujikawa, S., Maesako, T. (2015). Present Situation and Problems of Technology Education in Japan: With Focusing on Technology Education as General Education. *International Research in Education*, 2(3), 2015, pp. 173–182.

Hašková, A. (2015). Technical education – Cinderella in a technology-based society? *INTED 2015, 9th international technology, education and development conference, Conference proceedings*, pp. 90-98. Madrid: IATED Academy, 2015.

Hašková, A., Bánesz, G. (2015). *Technology at Basic Schools – Yes or Not*. Praha: Verbum, 2015.

Hašková, A., Dvorjaková, S. (2016). Analysis of Technology Education Development at Schools in Slovakia. *The European Proceedings of Social and Behavioural Sciences EpSBS*, Vol. VIII – icCSBs 2016, pp. 236–245. Future Academy, 2016. DOI: http://dx.doi.org/10.

15405/epsbs.2016.05.24, http://dx.doi.org/10.15405/epsbs(2357-1330).2016.5.

Hašková, A., Manduľáková, S., Van Merode, D. (2017). Problematic Aspects of Technology Education in Slovakia. *Communications: scientific letters of the University of Žilina*, 1(19), 2017, pp. 75–80.

Hus V., Aberšek, B. (2007). Early science teaching in the new primary school in Slovenia. *Journal of Baltic Science Education*, 1(6), 2007, pp. 58-65.

Jaeger, R. M. (1988). *Survey Research Methods in Education. Complementary Methods for Research in Education*. Washington, DC: American Educational Research Association, 1988.

Králik, R., Tinley, S. J. (2017). Kierkegaard`s ethics as an answer to human alienation in technocratic society. *Communications - Scientific Letters of the University of Žilina*, 1(19), 2017, pp. 25-29.

Lamanauskas, V., Gedrovics, J., Raipulis, J. (2004). Senior Pupils' Views and Approach to Natural Science Education in Lithuania and Latvia. *Journal of Baltic Science Education*, 1(5), 2004, pp. 13-23.

Law No. 83/1990 on the Association of Citizens. Available from: http://amavet.sk/download/kluby/dokumentacia/2010/zakon_o_zdruzovani_obcanov.pdf.

Law No 245/2008 on Education. Available from: https://www.minedu.sk/zakon-c-2452008-z-z-o-vychove-a-vzdelavani-skolsky-zakon-a-o-zmene-a-doplneni-niektorych-zakonov-v-zneni-neskorsich-predpisov/.

Lukáčová, D. (2014). Requirement of companies on school graduates. *Trends in education*, 1(7), 2014, pp. 345-348.

Lukáčová, D., Bánesz, G. (2007). *Technology Education Transformations*. Nitra: UKF, 2007.

Manduľáková, S. (2016). Regional differences in technology teaching. *Mutual informedness – a way to efficient development of research and pedagogical activities.* Nitra: UKF, 2016, pp. 32–39.

MŠVVaŠ SR (2013). *Activity Status Report on the Education System and Systematic Steps for its Development.* Available from: file:///G:/

Subory%20od%2006-05-2015/Publ/JTIE/Podklady/Správa%20o%20stave%20školstva%202013.pdf.

MŠVVaŠ SR (2016). *National Development Program of Education and Training "Learning Slovakia"*. Available from: http://www.minedu.sk/tezy-k-narodnemu-programu-rozvoja-vychovy-a-vzdelavania.

NR SR (1996). Act of the *National Council of the Slovak Republic* No 350/1996. Available from: https://www.nrsr.sk/web/Static/en-US/NRSR/Dokumenty/rules_of_procedure.pdf.

NR SR (2018). *National Council of the Slovak Republic*. Available from: https://www.nrsr.sk/web/.

OECD (2010). *PISA 2009 Results: Executive summary*. Paris: OECD, 2010.

Olsen, R. V., Lie, S. (2011). Profiles of Students' Interest in Science Issues around the World: Analysis of data from PISA 2006. *International Journal of Science Education*, 1(33), 2011, pp. 97-120. DOI: 10.1080/09500693.2010.518638.

OZ PŠaV (2016). *Declaration of the Trade Union of Workers in Education and Science of Slovakia.* Available from: http://www.ozpsav.sk/sk/Aktuality/udalosti-oznamy/deklaracia-odboroveho-zvazu-pracovnikov-skolstva-a-vedy-na-slovensku-a-partnerskych-reprezentac.alej.

Pavelka, J. (2016). Developing Students' Select Competences during Technology, Physics and Mathematics Lessons at Basic Schools. *Journal of Technology and Information Education*, 2(7), 2016, pp. 76–92.

Pupala, B. (2016). *Weak dream about "Learning Slovakia"*. Available from: https://www.postoj.sk/18134/riedky-sen-o-uciacom-sa-slovensku.

Seidman, I. E. (1991). *Interviewing in Qualitative Research*. New York: Teachers College Press, 1991.

Serafín, Č., Bánesz, G., Havelka, M., Lukáčová, D., Kropáč, J. (2016). *Transformation of technology education curricula in the Czech and Slovak Republic after the year 1989*. Olomouc: UP, 2016.

ŠPÚ (2008). *State Education Program*. Available from: http://www.statpedu.sk/clanky/statny-vzdelavaci-program.

ŠPÚ (2015). *Innovated State Education Progra*m. Available from: http://www.statpedu.sk/clanky/inovovany-statny-vzdelavaci-program.

ŠVP ISCED 1 (2008). *State Education Program for the first stage of basic education. Educational Area: Man and the World of Wor*k. Available from: http://www.statpedu.sk/sk/Statny-vzdelavaci-program/Statny-vzdelavaci-program-pre-1-stupen-zakladnych-skol-ISCED-1.alej.

ŠVP ISCED 2 (2008). *State Education Program for the second stage of basic education - lower secondary education. Educational Area: Man and the World of the Work*. Available from: http://www.statpedu.sk/sk/Statny-vzdelavaci-program/Statny-vzdelavaci-program-pre-2-stupen-zakladnych-skol-ISCED-2/Clovek-a-svet-prace.alej.

UNESCO (1974). *Revised Recommendation concerning Technical and Vocational Education adopted by the General Conference of UNESCO at its eighteenth session, Paris, 19. November 1974*. Available from: http://www.google.sk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CDQQFjAA&url=http%3A%2F%2Fwww.unesco.org%2Feducation%2Finformation%2Fnfsunesco%2Fpdf%2FTECHNICA.PDF&ei=3FObUs34Kcms4ASO1YDwCw&usg=AFQjCNE-ARvhHCghxI9K8z d5MXYJVQUNcw&bvm=bv.57155469,d.bGE.

Valentová, M., Brečka, P. (2017). Analytical comparison of technology education content at basic schools in Slovakia and Czech Republic. *Trends in Education*, 1(10), 2017, pp. 7-14. DOI 10.5507/tvv.2017.002.

Vantuch, J. (2015). *Is the system of education a support or a barrier to progressive structural changes in the economy of Slovakia*? Bratislava: Ekonomy institute of Slovak Academy of Science, 2015.

Tomková, V. (2010). Vocational education of secondary school students in the Slovak Republic. *Cywilizacyjne wyzwania edukacji zawodowej:*

wybrane problemy ksztalcenia zawodowego w Polsce i na Slowacji. Rzeszów: Max druk - Drukarna medyczna, 2010.

Zelina, M. (2016). *Strong critique of the prepared reform of the Slovak system of education. The experts discover the discovered!* Available from: http://www.pluska.sk/rady-tipy/10/dalsia-reforma-skolstva-vazeni-ste-si-isti-teraz-nase-deti-neprepadnu-sutazi-so-zahranicim.html.