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FOREWORD

Dear Colleagues, dear Readers!

The special, 3rd issue of Acta Technologica Dubnicae which is penetrating the world, is gaining a reputation, regular readers and contributors is here. Our great news is that, after the inclusion of Acta Technologica Dubnicae in ERIH PLUS on September 24, 2015, on December 4, 2015 our journal was added to DOAJ. All the contributions published in Acta Technologica Dubnicae are freely accessible at <http://www.degruyter.com/view/j/atd>.

Starting from 2016, the journal will change some of its criteria for publication in order to follow worldwide trends. Authors will be required to submit their articles in accordance with APA (The American Psychological Association) formatting and style, the standards of which will be included in the Guide for Authors in Acta Technologica Dubnicae.

What have we prepared for you? In this issue, you can find a prologue by Daniel Lajčín, the Chairman of the Governing Board of the Dubnica Institute of Technology, its founder and the publisher of Acta Technologica Dubnicae. He looks back into the institute's short history, mentions its activities and outlines the strategic vision of the institution.

The special issue of Acta Technologica Dubnicae brings three research studies, two review articles, two book reviews, one contribution dedicated to a life anniversary and an information about an award for our journal by authors from both Slovakia and abroad.

The section of studies is opened by the paper of Miroslav Krč, an author from Slovakia, entitled "Codes of Ethics and Their Place in Education". The paper deals with the place of codes of ethics within the system of ethical work. He analyses schools in Olomouc district based on whether they use codes of ethics and how they deal with them. The research problem was set whether the teaching profession needs its own code of ethics. The advantages of mandatory codes of ethics or codes of ethics generated based on schools' own initiative are analysed there, too. The research results indicate that the best way is to provide schools with a sample code of ethics and let them adapt it to their specific conditions.

The Czech university environment is represented by Peter Gavora and his study "Analysis of Interaction Patterns in the Focus Group Interview". By means of a

focus group interview of a moderator and a group of undergraduate students, the author analyses the topic of self-regulation of learning. The author introduces the functions of the common ground and its accomplishment in the talk of the moderator and participants.

In the contribution “The European dimensions of vocational training”, Tamás Sós, representing the Hungarian scientific community, deals with the performance, quality and appeal of vocational education and training in Hungary in the period after 2000 in comparison with other European countries including Slovakia. Vocational education is a currently topical issue in the whole EU.

The first review article is by Tomáš Kozík from the Constantine the Philosopher University in Nitra, Slovakia. In the article entitled “The Strategic Importance of Technical Education for the Economic Development of the Society”, the author deals with the development of technical education in Slovakia. He cites the autumn 2012 policy statement which considered “education, science, research and innovation, information and digitization to be essential pillars of the knowledge-based society and economy”. The author of the article supports education of science and technology leading to the development of job skills of primary school pupils to ensure professional orientation of students, particularly at secondary vocational schools.

The section of review articles is closed by Lívia Hasajová from Slovakia who focuses on “Mathematical Literacy as an Essential Criterion of Healthy Personality Development and of Effective Education with an Emphasis on Class Climate”. She accentuates that personality development is determined by several factors. She focuses on the effect of mathematical literacy and points out that gaining new knowledge and skills not only from mathematics is influenced by class climate and the environment in which the educational process takes place.

In this issue of Acta Technologica Dubnicae, our readers can find two book reviews. Katarína Greškovičová analyses the most important chapters of Eva Szobiová’s monograph “Creativity – unravelling the mystery”. 1st ed. Prague, CZ: Wolters Kluwer, 2014. 296 pp. ISBN 978-80-7478-564-1 and Miriam Bitterová evaluates the monograph entitled “Školský manažment pre študijné odbory učiteľstva a prípravu vedúcich pedagogických zamestnancov” (School management of the courses for teachers and preparation of leader teaching staff). Bratislava: Univerzita Komenského v Bratislave, 2014, 228 pp. ISBN 978-80-223-3621-5 by Mária Pisoňová et al.

In the occasion of the jubilee of a Slovak pedagogue, RNDr. Karol Korintuš, PhD., in the section of information one can find a brief article dedicated to his

life and work. The Editorial Board of Acta Technologica Dubnicae is sending warm congratulations to him.

We are also happy to inform our readers that Acta Technologica Dubnicae has been awarded the Slovak Welding Society's Commemorative Medal for its contribution to the development of technical education.

Dear readers, by giving space for publishing scientific papers in Acta Technologica Dubnicae, we aim to make Slovak and foreign authors' research results accessible, to introduce our journal to the broader international professional community in order to confront scientific knowledge and to intensify cooperation between educational and scientific research institutions.

*Viola Tamášová
Editor*

PROLOGUE TO THE SPECIAL ISSUE OF ACTA TECHNOLOGICA DUBNICAE

Dear Colleagues, Dear Readers!

Not only in lives of individuals, but also in the case of institutions that people found with the purpose of bringing social benefit, important anniversaries come round. It is the time, when people take stock of the time that has passed, commemorate and celebrate. Such a day has come for a private institution - the Dubnica Institute of Technology in Dubnica nad Váhom, which has entered into its 10th year of academic existence.

The Dubnica Institute of Technology was founded in 2006, in the era of rapid development of private schools providing higher education in Slovakia. During the years of its existence, the institute has been included in the network of institutions providing higher education in Slovakia and has provided higher education to almost ten thousand graduates at the first and second level of higher education. After the process of complex accreditation in years 2006 – 2010, the school was, based on the excellent results achieved, included among the institutes which do not belong to universities nor colleges. By that act, good conditions were created for its further development five years ago.

Currently, the Dubnica Institute of Technology provides higher education in four bachelor and two master programs of study. The bachelor programs of study are the following: Teacher Training in Vocational Education and Teacher Training in Practical Economic Subjects, but also non-teaching programs of study – Management and Electronics of Transportation. In master programs, we provide higher education in the programs of study Teacher Training in Technical Subjects and Teacher Training in Economic Subjects. Our institute is oriented on training future teachers of practical training and teachers of vocational subjects at secondary schools, by which it is fulfilling its long term goal in the field of education and scientific research work.

Supporting regional development and other specific services oriented on lifelong learning are, besides higher education and scientific research work, the third major task of our institution. The Dubnica Institute of Technology carries out a wide range of activities in this field. In accordance with the character of our institution, we provide courses of continual education for the pedagogical staff of secondary schools with the aim to widen and to supplement their professional competencies required for their educational work. After finishing

continual education courses, we give the teachers an opportunity to get the first and the second attestation. For graduates of the non-teaching programs of study, we provide supplementary pedagogical studies, graduates of which get qualifications for teaching. We also implement activities in the field of vocational education with the intention to develop and improve teachers' managerial skills and competencies. In cooperation with our partner institutions, we offer managers the opportunity to earn the prestigious degree of MBA (Master of Business Administration).

As a part of lifelong education, the Dubnica Institute of Technology in Dubnica nad Váhom organizes interest-based non-qualification programs for people in post-productive age within the University of the Third Age, the aim of which is to provide an opportunity to deepen and supplement one's knowledge. During school holidays, within the summer educational project Children's University, we offer children at early school age the opportunity to experience an alternative approach to education.

Ten years is not a long time in the life of an educational institution, but the success it has achieved so far encourages us to take further steps. My vision is to raise our institution to the level of a high quality European institute which has its roots in the region, but its graduates will be prepared to participate in the European division of labour. Such a vision requires willingness and the ability to provide high quality higher education in forward-thinking programs of study, creation of partnerships with other institutions of higher education, with the public and private sectors more intensively as well as doing meaningful scientific research work.

An important part of the scientific research activities of the Dubnica Institute of Technology in Dubnica nad Váhom is publishing a scientific journal – Acta Technologica Dubnicae. The journal is focused on the pedagogical, psychological and technological aspects of education and we commemorate the 5th anniversary of its foundation these days. It is up to the readers and users of information published in the journal to judge if the journal fulfils their expectations, but it undoubtedly contributes to the overall qualitative improvement of our school's scientific work. I appreciate the work of the whole Editorial Board, the contributors, but also those who are trying to create a so much needed platform for discussions about schools, educational work and vocational education from various aspects, by means of the journal.

In the occasion of these anniversaries of the institute and the scientific journal Acta Technologica Dubnicae, I would like to thank everyone who contributed to the exceptional reputation of our school and its development in any way and from any position. I thank the Editorial Board for their devoted work, all the

contributors for valuable contributions and I wish the readers of this journal that it remains a source of new knowledge and inspiration for further work in the coming years. I wish you all a lot of personal and professional success.

Doc. Ing. Daniel Lajčín, PhD.

*Chairman of the Government Board of the Dubnica Institute of Technology in
Dubnica nad Váhom*

Director General of Dupres Group

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STUDIES

Codes of Ethics and Their Place in Education

*Miroslav Krč**

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Abstract: The paper deals with the place of codes of ethics within the system of ethical work. In schools in Olomouc district, we analyzed whether they use codes of ethics and how they deal with them. In this region, there are 153 schools and the sample consisted of 80 schools. The research problem was set whether the teaching profession needs its own code of ethics. The advantages of a mandatory code of ethics or a generated code as their own initiative are analyzed here. The research results indicate that the best way is to provide schools a sample code of ethics and let them adapt it to their specific conditions. The research has been mixed, it includes a quantitative research that describes phenomena using variables and qualitative research interpreting the respondents' views on the relation of ethics and professional conduct. The greatest lack a code of ethics was found in secondary vocational schools. Secondary grammar schools usually treated ethical codes. In most European countries, it represents one of the curriculum options in ethical education.

Key words: ethics, code of ethics, education.

1 Introduction

Codes of ethics serve as a formalized ground for easier and more accurate assessment of behaviour. In addition, codes of ethics have an unmistakable, morally educative and preventive meaning. The teaching profession does not dispose of an officially established code of ethics, unlike physicians, social workers and others. Many schools have their own code. Most of them are private schools that have realised that as the pupils have their rights and duties towards the school, these rights and duties are required from teachers, too. Its creation is not a replacement or extension of the Conditions of Employment. Its main goal should lie in motivation of each teacher.

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Therefore, the question should be whether the teaching profession needs its own code of ethics. People with high emotional intelligence are perceptive and thanks to the ability they know how to make right decisions and act adequately. They do not need a code of ethics. Other people do not dispose by this talent and such a code could help them.

2 Ethics and Codes of Ethics

Ethics has served as the basis of the original law, but law contains a minimum of ethics. By means of ethics, one should be able to say whether what individuals or a companies do is good or bad. The answer is ambiguous due to individual and ethnic differences. Ethics is a normative science and defines the scope of ethical principles that are called codes of ethics. Codes of ethics represent only a morally binding norm, but they should not contradict the current legislation. Ethics by Sokol can be described as follows: "A science of morality is part of practical philosophy; it asks what is right and wrong and what should and should not be." (Sokol, 2010, p. 66).

Ethics by Nytrova is not to determine "what we may and what we must not, but it always helps us to seek and expand what is moral, what is indecent and that we can act correctly or incorrectly. Ethics is closely associated with the theory of values. As "good" is ethically considered as the supreme human value, ethics teaches to recognize what is good and what is not good." (Nytrova, 2007, p. 34). "A person acts morally if he/she behaves knowingly and willingly consistently with obligations, otherwise we can talk about immoral behavior." (Jankovsky, 2003, p. 223).

Morality determines socially desirable and undesirable conduct, and thus it influences human behavior in the society. We assume that humans are rational entities and that free and rational decision making is a necessary condition for moral responsibility. Ethics should look at what is right and what is wrong, what is good and what is evil; it should examine moral decisions of people and the ways in which they try to justify.

Codes of ethics define the standards of behavior in the workplace; their existence is evident in larger and multinational companies. At present, companies work out the basic ethical values, and they represent a key management tool. Currently, the Code of Ethics is one of the most common tools of implementation of ethical principles into business practice.

A Code of Ethics should identify certain desirable boundaries of behavior. A Code of Ethics serves for determining the principles and rules of behaviour and it is mostly based on the defined goal and values of specific company. Generally,

codes of ethics are drawn up to define the relationships with the public, employers, customers and other professional groups. It depends on the particular organization and its specific focus, how it specifies its own ethical code, how it communicates it, whether the code is periodically revised, to what extent it is mandatory for the employees and whether its violation is penalized.

Many professional disciplines have developed codes of ethics that are more or less binding on the competent employees. In some areas, e.g. advocacy, medicine, forensic expertise, there are ethical codes with serious legal validity. In some professional associations, e.g. the Czech Educational Research Association, codes of ethics do not have legal consequences and their members can adopt them voluntarily.

The professional skills and values of the teaching profession require from teachers gathering a lot confidential information concerning the lives of students. Their steps must be in accordance with the ethical principles of the teaching profession. The definition the teaching profession should be based on the professional values and knowledge that can be summed up as follows:

- teachers should show their passion for their profession and for working with pupils (students);
- teachers reflect on their work, i.e. they are able to describe, analyze and evaluate it, to explain the reasons for their conduct or to propose alternative ways of working;
- teachers plan their future professional progress and their professional competence (attitudes and values, knowledge and skills of pedagogical-psychological, industrial-educational, professional, labor law, knowledge and skills of modern information technology);
- teachers plan their professional progress in accordance with the objectives and tasks of school;
- teachers use a variety of means available, e.g. literature, internet, consulting with colleagues, education courses for teachers;
- teachers evaluate their teaching and educational progress continuously and they are able to demonstrate their career steps;
- teachers take care of their physical and mental health;
- teachers avoid actively stress and burnout.

In addition to professional knowledge and professional skills, we can find other factors defining the teaching profession, e.g. the key responsibilities of teachers in the educational process. Some authors accentuate the value dimension and ethical responsibility. Here, the professional values of teachers as more important than their knowledge and skills.

Talking about ethics is not the same as doing ethics. Achieving a consensus is not doing ethics. An ethical solution is not necessarily what produces happiness or satisfaction of the interests of all those who are involved. Any decision made by an educator related to what the educator does as an educator contains an ethical component as education involves the interaction of human beings - the base and generation of ethical concern. Many of the decisions to be made involve a set of common ethical issues although they will be set within a wide array of circumstances.

There are some basic steps or phases that a person should go through in making decisions of a moral nature:

- 1 Identify the ethical issues involved in the situation and the decision to be made;
- 2 Consider a number of possible alternatives;
- 3 Consider the possible consequences for learners;
- 4 Identify the possible harms in each alternative;
 - avoidable harms/unavoidable harms;
 - necessary harms/ unnecessary harms;
- 5 Identify the benefit of each alternative.

3 Codes of Ethics Analysis

Developed professional values and professional skills are a prerequisite for creating a code of ethics. Codes of ethics have been developed by some secondary schools and universities. They include the competences of teachers, relationships within schools and between teachers. On the upper secondary level, they have already been on the rise, especially in private secondary schools and colleges. The share of ethical codes in secondary and higher education is over 50%. To examine the current status regarding codes of ethics, we have analyzed schools in the Olomouc district. The total number of schools here is 153. (<https://www.czso.cz/>; https://vdb.czso.cz/vdbvo/tabparam.jsp?cislotab=VZD4010UC&kapitola_id=17&voa=tabulka&go_zobraz=1&childsel0=3).

An electronic questionnaire was sent to 86 schools and 80 completed questionnaires were returned. The analysis was carried out using the returned questionnaires from different schools. This research can be classified as mixed as it involves a quantitative research that describes phenomena using variables and a qualitative research interpreting the respondents' views regarding the relation of ethics and economic behavior, especially by means of the last three questions in the questionnaire. What we found was that 41 schools had already created their own codes of ethics, 8 schools were to create it. The analysis showed that codes of ethics do not differ from school to school, though each school had formulated its own code of ethics. It can be stated that the existence

of codes of ethics is gaining importance in education process. A code of ethics is missing most at secondary technical and vocational schools. Secondary grammar schools are an exception as they usually apply a code of ethics.

In 21 schools, own codes of ethics were worked out based on the school's own initiative and in 20 schools it was recommended by the founder. Ethical codes met their aim in 33 schools and only 8 schools did not think so. It is a positive finding that the schools did not just take over a ready code of ethics, but they tried to take into account the specifics and the orientation of the school. Approximately the same was in the case of the answer to the question whether the code of ethics was "mandatory for you" – respondents from 34 schools answered "yes", from 7 schools "no". More than 90% of schools expressed that their code of ethics was sufficient. However, the respondents were dissatisfied with the fact that their code of ethics did not reflect the specialization of the school, was not related to the pupils, colleagues or the public, and did not reflect the professional orientation of the school.

Only 36% of the respondents called for the legitimization of the code of ethics. Conversely, 64% expressed a negative opinion. The result gives us an answer to the question whether it is beneficial to legitimize the codes of ethics. The majority of teachers did not consider legitimization necessary. While 62% of respondents expressed that the legal anchoring of the code of ethics would not cause an increase in the quality of teachers, 38% of the respondents expressed the opposite opinion. 85% of respondents expressed the opinion that schools that had created a code of ethics were better at assessing pupils' behavior than those that had not created it.

The liability and the possibility of penalties for non-compliance of the code of ethics are quite high. Up to 80% of schools expressed that their code of ethics is on the level of the conditions of employment and there is the possibility of sanctions in case of its violation. Only for 10% of the respondent perceived the code of ethics as advisory but still respected. The results show that the respondents consider the code of ethics as something that to a big extent supports the quality of teachers, schools and education. 92% of schools rated their code of ethics as sufficient. Only in three cases the respondents indicated certain drawbacks. These include that their code of ethics did not represent or respect the specialization of their school and did not include the relationship with students, their colleagues or the public. The majority (65%) expressed disapproval when being asked whether they would welcome legal anchoring of the code of ethics in education.

Social responsibility is closely related to ethics, although ethical responsibility is not legitimized. However, ethical behavior and trust suffer largely under present

circumstances, because of interest groups' clientism. In a research of the Transparency International of the Czech Republic in 2005, the attitudes of Czech managers towards ethical principles abiding were surveyed. The survey included 254 Czech managers from middle management and 50 top managers. 68% respondents stated that the most important motive for responsible behavior were the ethical and moral reasons (Pavlik, 2010). This finding corresponds with the results of our research (2015) in the education sector, where 62% of respondents stated that the legitimization of a code of ethics did not automatically lead to ethical behavior.

4 Pedagogical Competence and Ethics

How is the relationship between competence and ethics manifested? When selecting applicants, their competence should be considered primarily. Competence is defined as a person's ability to behave in an appropriate manner to the requirements of the job and thus to contribute to the desired outcomes of a company. Professional ethics has an important role in an employee's competencies, it forces professionals to be more ethical; develops value orientation and moral thinking; and helps to understand properly the role and importance of professional positions in the contemporary society.

The notion of profession is understood as a specific term and it appears in relation to a specific group of professions based on long-term theoretical training. Professional competencies are considered to be the general ability to perform a job successfully, e.g. teaching vocational courses. Therefore, they create an essential prerequisite for a teacher's performance not only at this, but also at a future job position. Competencies are represented by skills and knowledge that are widely applicable.

According to Podlahova (2012), teaching skills necessary for the teaching profession, "are also known as didactic, they do not only consist of the ability to teach, give lectures or application of methods, principles and expertise in techniques of education. Teaching competencies mainly represents a set of specific and highly expert knowledge, skills, attitudes and experiences that are consistent with the educational process, reflect changes in the society, and take into account the intellectual predispositions, personality, individual interests and educational needs of students".

Professional competence represents an essential prerequisite for the teaching profession. It expresses knowledge, skills, abilities and attitudes of teachers they should achieve. To achieve these educational skills, teachers must become familiar with the basics of didactics and psychology, have life experience and skills of self-reflection. The most effective way of knowledge acquisition for

building and fixing educational skills necessary for teachers at all levels of education is the study and mastery of the basic teaching methods.

Several associations have been created in the last 20 years, tending to solve the current status of education with the support of expert knowledge, professional competence and moral property, e.g. Teacher Profession Association, Friends of Engaged Learning, the Association of Directors of Elementary Schools, the Association of Teachers of Secondary Schools, etc. Nevertheless, none of these associations set a code of ethics in the narrow meaning. Their ethical codes replace the statutes of the association, goals and mission and they just serve to ensure the moral credit of each individual profession.

Code of Ethics

The National Education Association (1975) believes that the education profession consists of one education workforce serving the needs of all students and that the term 'educator' includes education support professionals. The educator, believing in the worth and dignity of each human being, recognizes the supreme importance of the pursuit of truth, devotion to excellence, and the nurture of the democratic principles. Essential to these goals is the protection of freedom to learn and to teach and the guarantee of equal educational opportunity for all. The educator accepts the responsibility to adhere to the highest ethical standards.

The educator recognizes the magnitude of the responsibility inherent in the teaching process. The desire for the respect and confidence of one's colleagues, of students, of parents, and of the members of the community provides the incentive to attain and maintain the highest possible degree of ethical conduct. The Code of Ethics of the Education Profession indicates the aspiration of all educators and provides standards by which to judge conduct.

The remedies specified by the NEA and/or its affiliates for the violation of any provision of this Code shall be exclusive and no such provision shall be enforceable in any form other than the one specifically designated by the NEA or its affiliates.

Principle I

Commitment to the student

The educator strives to help each student realize his or her potential as a worthy and effective member of society. The educator therefore works to stimulate the spirit of inquiry, the acquisition of knowledge and understanding, and the thoughtful formulation of worthy goals. In fulfilment of the obligation to the student, the educator:

1. Shall not unreasonably restrain the student from independent action in the pursuit of learning.
2. Shall not unreasonably deny the student's access to varying points of view.
3. Shall not deliberately suppress or distort subject matter relevant to the student's progress.
4. Shall make reasonable effort to protect the student from conditions harmful to learning or to health and safety.
5. Shall not intentionally expose the student to embarrassment or disparagement.
6. Shall not on the basis of race, color, creed, sex, national origin, marital status, political or religious beliefs, family, social or cultural background, or sexual orientation, unfairly:
 - a. Exclude any student from participation in any program.
 - b. Deny benefits to any student.
 - c. Grant any advantage to any student.
7. Shall not use professional relationships with students for private advantage.
8. Shall not disclose information about students obtained in the course of professional service unless disclosure serves a compelling professional purpose or is required by law.

Principle II

Commitment to the profession

The education profession is vested by the public with a trust and responsibility requiring the highest ideals of professional service.

In the belief that the quality of the services of the education profession directly influences the nation and its citizens, the educator shall exert every effort to raise professional standards, to promote a climate that encourages the exercise of professional judgment, to achieve conditions that attract people worthy of the trust to careers in education, and to assist in preventing the practice of the profession by unqualified persons.

In fulfillment of the obligation to the profession, the educator:

1. Shall not in an application for a professional position deliberately make a false statement or fail to disclose a material fact related to competency and qualifications.
2. Shall not misrepresent his/her professional qualifications.
3. Shall not assist any entry into the profession of a person known to be unqualified in respect to character, education, or other relevant attribute.
4. Shall not knowingly make a false statement concerning the qualifications of a candidate for a professional position.
5. Shall not assist a non-educator in the unauthorized practice of teaching.

6. Shall not disclose information about colleagues obtained in the course of professional service unless disclosure serves a compelling professional purpose or is required by law.
7. Shall not knowingly make false or malicious statements about a colleague.
8. Shall not accept any gratuity, gift, or favor that might impair or appear to influence professional decisions or action.

5 Conclusion

Codes of ethics have been formulated by one half of all the schools in the Olomouc district. The codes of ethics are parts of the internal directive or organizational rules. The codes of ethics have been created on the basis of the schools' own initiative or the founder's recommendation. The specifics of each school are respected in the code of ethics by 80% schools of the total number. Only 10% of schools expressed the view that the code of ethics of their school is too general and does not respect the school's specifics. More than two thirds of the ethical codes support a proactive approach to protecting the environment and take into account the economic priorities. The code of ethics is specified according the orientation of a particular school.

Not only in education is the behavior of employees controlled by certain rules. Some assignments or directives may have the form of recommendations that are traditionally observed. Some must be signed and affirmed to be respected and their violation will be penalized up to dismissing an employee.

In general, principles related to teachers' treatment of students, educational process, preserving and enhancing the dignity of the staff are considered as the foundations of pedagogic ethics. And if they are additionally regulated by a code of ethics in accordance with the specific orientation of the school, their significance and prestige are increased even more.

However, legitimization of a code of ethics does not increase the quality of teachers, but creating their own code of ethics in accordance with the specific orientation of the school, would affect the behavior of teachers towards pupils (students). This fact has also been observed throughout this research. Teachers prefer codes of ethics created by their own school to legitimizing it. It seems to be appropriate to follow the basic points of the general code of ethics which should be modified according to the specifics, technical orientation and other aspects of a particular school.

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An Analysis of Interaction Patterns in the Focus Group Interview

*Peter Gavora**

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Abstract: This paper is based on the analysis of a focus group interview of a moderator and a group of undergraduate students on the topic of self-regulation of learning. The purpose of the investigation was to identify interaction patterns that appeared in the talk of participants and the moderator. In the stream of communication two rudimentary interaction patterns were recognized. The first pattern was named the Catalogue. It consists of a sequence of turns of participants who respond to a request of the moderator and who provide their answers, one by one, without reacting on the content of the previous partner(s) talk. The other interaction pattern was called the Domino. In this pattern participants respond to each other. The Catalogue pattern prevailed in the interview. Alongside with identification of patterns of interaction the study demonstrated the functions of the common ground and its accomplishment in the talk of the moderator and participants.

Key words: focus group interview, interaction, interaction patterns, common ground, grounding.

1 Introduction

Focus group interview is a format of interview that has been used in social research for more than 60 years. It is one of the most popular research methods nowadays. A quick search in the EBSCO database brought 26,302 articles with focus group as a key word in the journal abstracts. Another database, Proquest, brought nearly twice as many items, 56,420 (as of October 28, 2015). This proves the strong position of focus group interview in empirical investigation.

The basic purpose of focus group interview is to gather opinions, beliefs, attitudes and knowledge from a well defined set of participants. The topic of the interview is selected by the researcher. The opinions, beliefs, attitudes and knowledge are elicited in the course of interview rather than “mechanically produced” by focus group participants to the moderator. I deliberately refer to

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focus group members as *participants*, rather than respondents to emphasize the collaborative efforts of individuals within the interview. The moderator presents questions, hints and support for the group in order to elicit answers from the participants. Participants take turns to express opinions, beliefs, attitudes and specific knowledge about the topic discussed. Focus group interview is based on interaction between participants and it differs from research methods that do not allow interactive discussion, such as dyadic interview or Delphi groups (Stewart et al., 2007).

In contrast to the dyadic interview, the aim of focus group is to gather diverse thoughts, opinions and perspectives of focus group participants. Therefore, the chief task of the moderator is to encourage the participants to express the full range of perspectives and aspects within their talk (Vaughn et al., 1996; Morgan, 2001). Consensus is not the ultimate target of the focus group interview. Though participants can gradually reach an identical or similar position, it is not the intention of the focus group interview to harbour in a single perspective or idea. Rather the aim is to elicit a variety of perspectives and opinions on the topic chosen for the interview.

The originator of focus group interview is Robert Merton (Merton et al., 1990). He started to create focus group interview principles and to administer interviews as early as during the World War II. His centre of attention was market research and the aim was to gather data on the customers' thinking and attitudes on marketed products or services. However, in the last 40 years, social scientists, especially sociologist, psychologist and educators accomplished studies with a variety of participants: clients, employers, students, parents and teachers. Nowadays, focus group interview is a common research method in education and its principles and rules are explained in every relevant methodology textbook (cf. Johnson & Christensen, 2000; Flick, 2002).

2 Focus group as interaction

Most of the use of focus group interviews concentrated on the content elicited in the course of interviews with participants. On the other hand, the process in the course of which this content was developing was mostly neglected in empirical studies (Hydén & Bülow, 2003). This is considered a drawback because interaction features contribute substantially to understanding by the researcher of what is presented by focus group participants. Interaction is the process of exchange of participants' turns and ideas. Therefore, the analysis of content and interaction is highly recommended by experts (Halkier, 2010, Gronkjaer et al., 2011). Halkier (2010) stresses that by analysing the interaction the researcher can reveal the dynamics of the group within the social context. According to Kitzinger (2005) the key issue in focus group research is to treat

the interaction in the group (the exchange of ideas and experiences, use of rhetoric or anecdotes, shifts in agreement and disagreement) as an integral part of the data.

Focus group interview requires coordination of participants' actions in order to move the stream of communicated ideas ahead. This coordination is the core of the focus group interview. Each turn responds to a preceding turn, explicitly by adding new information to the content, or implicitly by respecting and using of the right to take the floor in interaction and being aware of the rules of speaking and listening.

Focus group interview has been used predominantly in the qualitative research projects. It has brought rich data of mutual interaction of the moderator and participants – and the participants themselves. In analysing interview, standard qualitative analysis procedures are used, such as thematic analysis, open coding, situation analysis etc. Occasionally, quantitative processing of data is employed, as in Clark and Schaefer's study (1987) who counted the number of presentations of telephone operators in telephone calls, or the number of customers' contributions in the interview.

3 The common ground

One important condition for the interview in focus groups is that the moderator and participant have a common ground. They must share the same knowledge in order to be understood and to accomplish a meaningful conversation (Clark, 2006). They have to possess a joint set of knowledge, attitudes, suppositions and beliefs in order to make interaction move forward. If they do not understand each other – or the situation they are engaged in – the interaction fails within several turns.

Common ground is information that is common to all participants in interaction. It is a sum of all information they possess and which they use while interacting (Clark, 2006, p. 105). This confirms that interaction is a coordination process. People cannot even begin to talk without assuming an amount of shared information, i.e., the common ground - mutual knowledge, mutual beliefs, and mutual assumptions (Clark & Brennan, 1991). The common ground frequently contains knowledge and beliefs that people take for granted, they are tacit, almost unnoticed, e.g., knowledge of the rule that two parallel talks are not permitted, or that the addressee must follow the hints of the speaker to take the floor. The process of contributing to a conversation consists of both specifying some content and grounding it, and the product of both is called *contribution*. Conversations proceeds, in this view, not utterance by utterance, but contribution by contribution (Clark & Schaefer, 1987).

The common ground of the moderator and the participants is always expanded in the course of focus group interviews. Each turn in interaction brings information that the moderator and participants share and further expand – to the joy of the researcher who organized the focus group exactly for gathering new information.

One of the features of common ground is *grounding*. It is an instrument by which speakers and listeners work together to ensure that messages are understood as intended. During the interaction, the moderator and participants attentively follow the stream of talk in order to ensure comprehension. In the case they fail, they address the interaction partner, the moderator or the participant, as the case may be, with a request to remove the incomprehension. This is grounding. They may pose questions or requests for *the repair* (a term of Conversation Analysis; cf. Sacks et al., 1974; Heritage, 1989). On many occasions, incomprehension is revealed by the participant's improper answer, or by a nonverbal sign which signals difficulties in comprehension of the message.

4 The purpose of the study

This study concentrates on interactional characteristics of focus group interview. Specifically, it is centred on identification of *patterns in interaction* between the moderator and participants and participants themselves. By an interaction pattern I mean a section of talk which has similar interactive qualities. Each pattern is characterized by the manner the participants contributed to the evolution of the topic of interview and by specific sequence of inclusion of each participant to the interaction. Alongside with identification of patterns of interaction the aim of the study is to follow how interaction contributes to accepting, respecting and expanding the common ground by the moderator and participants.

4.1 Sample and recruitment

Focus group interviews have always been organized with small-size groups in order to provide opportunities for each participant to enter the talk frequently. Kitzinger (2005) recommends the size between four and eight people. In this research the group consisted of 8 participants, three females and five males. They were undergraduate students who enrolled in the Faculty of Technology programme in a University in the Czech Republic. This focus group interview is one from the set of 18 interviews organized by the Research Centre of Faculty of Humanities of UTB in Zlín, Czech Republic, which concentrated on investigation of self-regulation of learning of university students (Kalenda & Vávrová, 2015; Kalenda & Vávrová, in press).

An important requirement to obtain a synergy of discussion in the group is its homogeneity (Morgan, 2001). Experts recommend homogeneity of the group in order to capitalise on participant's shared experiences (Kitzinger, 2005). In this

study the focus group is homogeneous as concerns the age of participants (21-23 years), length of study at the undergraduate level and the study programme.

The participants were recruited voluntarily. The purpose of the investigation was explained to them and the researchers guaranteed the protection of their privacy.

4.2 Method

The interview took place in the environment which the participants were familiar with - in the conference room within the university building. The camera was installed and the participants received stickers to write their names on for identification purposes. The mediator introduced herself and explained the purpose of focus group and the aims of the research project. The participants were encouraged to enter the talk, while respecting the rights of other participant to do the same.

The moderator was a woman who was acquainted with the rules and practices of the focus group interview and was familiar with the university environment in which the interview was administered. The author is appreciative to R. Polepilova for acting as moderator.

A theme frame was developed prior to the interview and was used to guide the discussion. The topics covered a number of items concerning self-regulation of learning, such as motivation and efforts for learning at the university, the importance of understanding the field of specialisation, qualities of a successful student, description of participants' drawbacks and strength as learners, ideas of how to improve learning competences and the like. The evolution of the content of the participants' talk was not the primary target of this analysis, it were interaction patterns. However, the content was considered when these patterns were identified.

The interview was video-recorded and the recording was transcribed. I used simple transcription rules: the words were transcribed verbatim, including substandard expressions and hesitation phenomena. Longer pauses, laughter and distorted speech were marked in the transcripts.

The unit of analysis was a *segment of interaction*. A segment starts with a question (or similar request) of the moderator introducing a topic, followed by several participants' turns discussing the topic. The segment ends when the moderator poses a next question. Schematically, an interaction segment looks like this:

Moderator's turn + N participants' turns
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A *turn* is a speaker's talk in interaction before another speaker takes the floor. In the analysis I proceeded by identifying each interaction segment, analysing its structure of turns and content. Basically the method of investigation was *microanalysis* of segments in interaction. Segments with the similar composition

of turns are labelled as interaction patterns. The aim was to identify the main interaction patterns in the course of focus group interaction.

In the extracts of interaction, which will be presented below for the purpose of analysis, the following abbreviations are used: Mod = moderator, P = participant (annexed by an assigned numeral). The numeral in the beginning of the turn is the number of the turn.

5 Findings

The focus group interview lasted 45 minutes, and yielded 54 interaction segments, i.e., approximately one segment per minute. This count indicates that the interview was rather vivid, intense and that it proceeded in rapid speed. Overall there were 299 turns of the moderator and participants, or an average of 33 turns per speaker. Participants differed as concerns the number of turns in the interview; some of them had many turns, other had few. As expected, the individual contributions of participants varied in length and wealth of ideas.

In the stream of talk of the moderator and participants two rudimentary interaction patterns were recognized. The first pattern will be named *the Catalogue*. It consists of a sequence of turns of participants who respond to a request of the moderator and who provide their answers, one by one. After the previous participant finished the turn, the next participant takes the floor and adds his/her own contribution, followed by a next participant, etc. This interaction pattern resembles a catalogue or inventory with objects listed in it. Analogically, a catalogue in interaction is a sequence of turns created by several participants who provide their turns.

In the Catalogue each response is relatively independent, however, contributing to the topic of the discussion. Each participant adds to the common ground a contribution, bringing to the topic personal opinions, attitudes and experiences. There is no doubt that the participant implicitly processes (pays attention to and comprehends) the contribution of previous participants – by which they build jointly their common ground. However, what is apparent in the participants' turns is that they are relatively independent. They do not expand the idea presented by previous participant(s). From the perspective of the moderator, the Catalogue is a valuable interaction pattern because it brings an array of opinions and attitudes of participants without intervening or encouraging them in the interaction segment.

The Catalogue pattern in interaction will be exemplified by a segment in which participants responded to the moderator's request to express their views of prerequisites of success in learning.

Extract 1

- 200 **Mod:** What is, in your opinion, the prerequisite of success in learning?
- 201 **P5:** If I enjoy it (*learning*) very much.
- 202 **P4:** Much time devoted to it.
- 203 **P3:** Conditions one needs for it. As everybody can be disturbed by anything so we should make the environment and need not cook something there and do inappropriate things.
- 204 **P8:** Time and courage to talk, communicate with instructors.
- 205 **P3:** If I do not know something I ask.
- 206 **P4:** Chiefly, avoid saying I do not know.
- 207 **P5:** If I do not enjoy it I can spend ten times as much for learning and still I learn less because I disfavour that subject; sometimes I am also discouraged by instructors. I am gazing on it but my brain does not take it. If I enjoy it, I simply read it through and go for A or B (*grades*).

Extract 1 consists of seven turns in which each of the participants presented specific opinions about conditions that may contribute to successful learning at the university. Each opinion was independent of the previous ones. There was no comment or other feature of expanding the previous participant(s) ideas. The interaction pattern of the Catalogue lacks mutual exchange of opinions, but it still contributes to building the common ground of participants and the moderator.

As concerns the content of the segment of interaction in Extract 1, the students revealed that the success in learning rests on their own efforts and management of learning rather than on external conditions. In the language of the self-regulation theory, they favour to execute self-direction strategies. Self-direction is an important component of self-regulation of behaviour and learning, usually accompanied with goal orientation, decision making and impulse control of the learner (Jakešová et al., 2015; Gavora et al., 2015). It is obvious that the participants have personal standards of success which is based on discrepancy reduction between their effort and the product of learning.

The other pattern of interaction that was extracted from the data will be called *the Domino*. It is exemplified in Extract 2.

Extract 2

- 137 **Mod:** How do you conceive it if someone points out at your shortcomings? How do you conceive it?
- 138 **P3:** It's better if I recognize it myself. Then I have to admit I am dumb.

139 **P5**: So have we.

140 **P3**: It is better if someone tells it to you pretty early rather than let you work (*on a task*) with an error. Then it is too late.

141 **P6**: Do I have shortcomings?

142 **All**: *Laughter*

143 **P5**: Thinking.

The Domino is an interaction pattern with participants' turns which frequently respond to each other. To label it, I used an analogy with the game of the domino in which a brick is placed next to the previous one having the same pattern of dots while the other part of the brick has different patterns of dots. The players can move at several directions while respecting the previous partners' set of dots. Similarly, in the Domino pattern of interaction a participant responds to the content of the previous turn. In the extract, the second participant (P5) responded on the previous participant (P3) generalizing the student's negative qualities to all members of the group – they all are dumb. Participant P3 (in line 140), however, explains the preference of error prevention as a better strategy. Participant P6 did not respond to the statements of P3 and P5 by posing an ironic question which developed laughter. Participant (P5, line 143) identified the qualities which the students lack – thinking. The tone of this segment of interaction was cheerful and the mood was humorous, which might have contributed to the responses to each other – the accomplishment of the Domino pattern of interaction.

The Catalogue and the Domino are two contrasting interactional patterns; they differ in the rate of communication *among* the participant. Whereas in the Catalogue there is no such communication, in the Domino there can be a large range of ideas shared among participants. In the interview I found a number of different ways of how participants responded on each other (expressing a range of communication functions: addition, extension, refusal, objection etc.), which confirms the potential of the focus group interview to produce rich data. (The communication functions represent a different research topic of which I dealt in another paper, Vávrová & Gavora, 2014).

The frequency of the Catalogue pattern prevailed over the Domino in the interview. This means that the management of the interview by the moderator and the participants' efforts caused the enumeration of ideas and opinions rather than exchanging ideas among participants. This may be a specific characteristic of this focus group composition and the topic of the interview, so one must be cautious in generalizing this finding to other focus groups.

Many interaction segments included requirements for *clarification* or *refinement* of the previous talk – both on the side of the moderator and the participants. For

instance, if the moderator posed a question and participants did not understand the wording or the context (in other words, they were unable to identify the common ground), one of them (interestingly, not more than one) requested clarification, expansion and the like. This applies also for cases when the moderator did not catch the common core. Then she posed a request for clarification.

Request for explanation is a feature of grounding, i.e., endeavour of establishing comprehension of what is going on in interaction. As it was explained, *grounding* is a procedure of supporting understanding by the moderator and participants in interaction and is an important element of interaction which assures joint activity of participants.

Extract 3 displays two segments of interaction. The first one corresponds to lines 107-108, the second one to lines 109-117.

Extract 3

107 **Mod:** And what helps you in learning?

108 **P2:** Methods?

109 **Mod:** Yes, when you have to learn.

110 **P1:** Chocolate.

111 **P2:** I always print out the list of questions, with spaces between them, onto which I write the basic things concerning the question, and then before the exam I flick through them, and all becomes clear to me.

112 **P3:** I work out the questions for harder exams in order to avoid turning pages constantly to find something. Then it is enough to look into it, and I know I have it somewhere, and I know how it looks like. It is easier to learn in this way. It does not occur constantly, but I have several worked out.

113 **P8:** It is laborious, though.

114 **P2:** I concentrate also on the visuality, so when I pull out a question (*in exam*) I have to imagine where I have it. I do not see the words but the colours help, for instance.

115 **P6:** First, I read it through, then I retell it and, third, I write the question on paper and add to it any idea I came across. Then I compare it with those in my copy book, for instance, what I have in it, then I add on it. In the subjects, we have a lot of derivations, for instance in math.

116 **P1:** So did I, I put everything on paper, I retell it to myself, repeat it, then I copy it and compare.

117 **P3:** These are things that you have to take notes about, it is not enough to read it and hope that one can remember it. It must be linked to other topics, though. One must do what one can.

After the moderator asked the question, the participant P2 (line 108) required the specification of the topic - and she got it. Without it interaction would probably have collapsed, or yielded only a few responses. In the second segment eight turns appeared, each contributing to the common ground concerning the methods of learning by participants. The first participant (P1, line 110), a female student, claimed that chocolate helps her in learning, the next participant P2 (also a female student) does not say anything about food or drinks while learning but minutely describes the process of working out the exam questions as her chief learning strategy. The next participant (P3, line 112) contributes to the common ground adding her own experiences. So far each turn was independent; *no one was an extension* of the previous one – a typical characteristic of the Catalogue pattern. This sequence is interrupted by participant P8 (line 113) who produced a remark, a kind of commentary on the two preceding turns, asserting that these strategies are rather strenuous. This commentary is a step aside from the straight Catalogue pattern of interaction because it is not independent, it relates to the previous participants' topics. This commentary was an expression of a personal attitude. Four turns follow (lines 114-117), each bringing the description of participants' individual learning strategies.

One must appreciate the sophisticated details which the participants provided about their learning strategies. However, one can also note that the students coincide university learning with preparing for exams only. There was no hint about systematic and continuous learning in the course of the semester. On the opposite, the students described only cramming for end-of-the-term examination - a typical management of study by many students in the Czech higher learning institutions.

Extract 4 shows the situation in which it is the moderator, not the participant, who requires clarification.

Extract 4

239 **Mod:** What do you do if you find that you do not understand something?

240 **P3:** I'll go and ask.

241 **P1:** I'll ask others.

242 **Mod:** Others?

243 **P3:** First students, and if they do not know, then the instructor.

In Extract 4 the moderator received two answers to her question about procedures that the students use when comprehension of the subject matter fails. She wanted the participant P1 (line 241) specify what she meant by "others", so

she posed an explanation request - a typical feature of grounding in interaction. Similar grounding features appeared in other moderator's turns in the case she failed to understand what a participant presented, or when she wanted to make the participant's response more specific.

From the perspective of the self-regulation theory, the answers in the Extract 4 evolved from the self-reliance strategy in learning of participants P3 and P1 (lines 240-241) to reliance on external assistance in learning of P3 (line 143). It is good that participants start with self-reliance procedure and turned to help of others if the self-help appeared inefficient. Self-reliance is a more valuable self-regulation strategy because the learner is autonomous and he relies on self-help rather than on others-help.

6 Conclusion

Focus group interview is a research method which gathers opinions, beliefs, attitudes, and knowledge of interview participants. Every focus group interview can be analyzed as regards its content and the process of interaction within which the content evolves. In this study I concentrated more on the latter than on the former, however, I had to take content into consideration when analyzing the interaction segments. In this paper I also showed how interaction in focus group interview is organized. By doing this I tried to untangle the strand of turns and voices – which proceeded in a rapid speed – and I make it more visible through microanalysis of interview segments.

There were two rudimental interaction patterns which emerged in the analysis of interaction, which are contrasting, i.e., the Catalogue and the Domino. Each of them has an important position in the interaction. I have demonstrated the merits and shortcoming of both. The Catalogue prevailed in this interview, and I claim that it prevails also in any other focus group interview in which the participants are eager to present themselves.

It was also demonstrated how the common ground was presented and expanded in order to preserve the course of interaction among the participants and the moderator. If comprehension failed, grounding was used and the missing information was provided.

A focus group is not a set of individuals but an assembly of people who were selected because they share some common characteristics. In this focus group university students, who acted as participants, talked not as independent individuals but as members of a social group in their pre-professional phase of the career. Therefore, the findings of this investigation do not have a strong generalisation power. Rather – and in accord with the tradition of qualitative inquiry – they have the potential to explain and demonstrate a certain social and cultural context.

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The European Dimensions of Vocational Training

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Abstract: The research examined the connection between vocational education, training and the world of work, and the social situation in Hungary in a European outlook. The accentual issues of the analysis disclosing the problem are: youth unemployment, the tendencies of secondary vocational education, proportions of enrollment and the features of training tendencies, the growing number of early dropouts, the effect of family background on student performance. This work tried to find the answer to the question: What variations have the changes in the regulations of vocational training, encouraging dual education brought on in the connection between trainers and work places? The research did not prove that the central vocational training system would be more effective than a varied, flexible, permeable, transparent decentralized operation with parts built on each other. The introduction of the complex exam overshadowed the evaluation of the competency areas, and fits less to the modularity of the framework curricula. With the legal regulation of vocational training in force the modular system has become a formality. Taking prior knowledge into account has become more difficult. The efficiency of professional structural decisions is questionable, it has not triggered the extension of employment among career starters, and does not mean a guarantee of finding a job either. Creating the motivation of economic role players may bring on steps forward to take up bigger tasks in vocational training. The research has confirmed the importance of improving the basic competency areas when planning vocational training, of life-long learning, of practice orientation, and also of the continuous connection with the labor market.

Key words: life-long learning, dual vocational education, employment, competency evaluation, EU educational issues, CEDEFOP, ET 2020.

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1 Introduction

This study examines the performance, quality and appeal of vocational education and training in Hungary in the period after 2000, in comparison with other European countries (The Copenhagen Declaration of the European Ministers of Vocational Education and Training and of the European Commission, 2002). The Copenhagen process means the beginning of a more direct, more emphatic European vocational training policy (Horn, 2009). It is based on common consent and is revised every other year. I examine four statements:

- The research starts from the fact that under political, economic and social effects the change of the regime took place in vocational training, employment and workforce management in Hungary. It shows several similarities to that of EU member countries.
- The second issue I examined is that the hierarchical build-up of secondary education with the composition of students rigidly replicates social differences, and conserves social inequalities by the differences in the level of education (Liskó, 2008).
- The third question is that, following the regulation of content of vocational training in 2010, short-term interests, supply and demand relationship, schoolwork-like accounting came to the fore. Modularity, interoperability, the foundation of life-long learning, competency-based education and accounting were neglected.
- I was trying to find the answer to the questions why in Hungary in the period discussed employers were not motivated enough, and why they didn't consider vocational training as their own.

The research is built on empirical examinations, on the analysis of Hungarian and European Union documents and statistics.

2 Qualification – employment – unemployment – poverty in the countries of the Union

I compared the connection between education and the world of work, the social situation with the average of the EU 28, with the characteristics of ten countries, including Hungary that I chose. My starting point was that "... in the European Union and in a broader international sense, the connection between education and work is characterized by problems just like in Hungary." (Halász, 1999).

Table 1

The rate of employment and unemployment in European countries in 2014 among those between 25 and 64. (%)

Country	Rate of employment	Target	Rate of unemployment	Unemployment of those under 25
EU28	69.2	75	9.0	22.2
Czech Republic	73.5	75	5.4	19.9
Denmark	75.5	80	5.5	-
Germany	77.7	77	4.7	7.7
Greece	53.3	70	24.8	52.4
Lithuania	71.8	72,8	9.9	19.3
Hungary	66.7	75	6.7	20.4
Austria	74.2	77	4.9	10.3
Poland	66.5	71	7.7	23.9
Slovakia	65.9	72	11.8	29.7
Sweden	80.0	80	5.7	22.9

Source: based on data of https://www.ksh.hu/docs/hun/eurostat_tablak/index.html, own editing.

Note: There are employees here who worked at least one hour in the framework of a labor force survey.

In the Europe 2020 Strategy an emphasized objective is to achieve the 75% employment rate. Considering employment dispersion is little, 2014 data just slightly differ from the EU28 (69.2%). The spread of dispersion is between Greece, the smallest (53.3%) and Sweden, the biggest (80.0%). Slovakia (65.9%) and Hungary (66.7%) are under the average. The point in the case of Hungary is in the details, too, at the end of 2014 there were 4,149 thousand employees, which is positive. Altogether 800,000 new workplaces were created, out of which 610,000 were supported by the state, that is a significant number, and 190,000 were not supported, and this number is insignificant. The number of public workers was 158,000 on a monthly average (www.ksh.hu; www.nszf.munka.hu). The number of insecure, foreign and temporary workplaces is also significant. As far as the details are concerned, it can be seen that except for a few top companies of the private sector, the Hungarian economy is at the level before the 2008 crisis.

Youth unemployment

Youth unemployment is a major concern, because the situation in this field in Europe has not improved in spite of the different measures taken in the past 25 years. The indicators are permanently high in the EU28 (22.2%) member countries, the Hungarian average (20.4%) is better than this; it is 29.7% in Slovakia. It is 52.4% in Greece, which is more than six times higher than in Germany (7.7%). The crisis hit the youth more heavily. “In Hungary one of the main reasons for the low employment of the hardly trained the ones having elementary or vocational education can be found in the basic competencies which are rather insufficient in international comparison. It is worrying that the lag of youth in this area is not smaller than it was with the earlier generations.” (Matheika, 2013).

Table 2

Employment rate according to school qualification in Europe in 1992-2004 among the 25-64 year-old. (%)

Countries	ISCED 0-2		ISCED 3-4		ISCED 5-8	
	1992	2014	1992	2014	1992	2014
EU28	-	51.8	-	70.0	-	82.1
Czech Republic	-	41.6	-	74.2	-	82.2
Denmark	63.7	59.6	77.7	77.4	90.4	85.5
Germany	52.3	58.0	70.5	78.1	83.5	87.7
Greece	55.8	46.5	57.0	49.2	77.7	67.6
Lithuania	-	42.0	-	65.6	-	88.4
Hungary	-	44.3	-	67.8	-	80.8
Austria	-	53.1	-	75.1	-	83.6
Poland	-	38.2	-	63.7	-	83.9
Slovakia	-	31.6	-	67.6	-	75.6
Sweden	-	61.0	-	80.9	-	87.4

Source: based on data by https://www.ksh.hu/docs/hun/eurostat_tablak/index.html, own editing

Note: Qualification level is listed according to the integrated international classification system (ISCED, 1997):

- ISCED 0-2 level: pre-school, basic education, the lower level of secondary education
- ISCED 3-4 level: the higher level of secondary education, post-secondary education (not higher education)
- ISCED 5-8 level: the first and second level of higher education

The tendencies are similar in the European countries. Based on data of 2014, the employment possibilities were potentially better for the more qualified workforce.

ISCED 0-2

The dispersion is moderate among the countries discussed. The average of the unqualified or low-qualified workforce is 51.1% in the EU28, which shows that every second person cannot find a job, and what is more, for the majority of them it only means temporary employment, not even for a whole year. Hungary (44.3%) is below the EU average, Slovakia has even a worse indicator (31.6%). Sweden is in the most favorable situation (80.9%).

ISCED 3-4

It is more certain to find a job with higher qualification, profession in the EU28 countries (70%), Sweden (80.9%), Germany (78.1%), whereas Greece plummeted in this field, too (49.2%). Slovakia (67.6%), Hungary (67.8%) near but stay under the union average.

ISCED 5-8

It is noticeable that with college or university degree one stands a lot better chance of getting a job. Among the countries discussed Lithuania (88.4%), Germany (87.7%), Sweden (87.4%) score highest.

Out of the Visegrad Four countries Poland (83.9%) and the Czech Republic (82.2%) score best. Hungary (80.8%) and Slovakia (75.6%) are under the EU28 average (82.1%). In the past decade the number of students in higher education has continuously grown. In 2001 in the EU countries 16.5 million people enrolled in higher education, in 2012 this number was 20.2 million. At the same time this number grew from 13.6 million to 21 million in the United States (https://www.ksh.hu/docs/hun/eurostat_tablak/index.html). Prior to the slowdown in the past few years, the proportion of those taking part in higher education has continuously grown in the period discussed.

About the Hungarian vocational education in a European outlook

In a given country the weight of (upper) secondary vocational education is partly shown by the proportion of youth enrolling in vocational education. In the period discussed, the circle of those participating in vocational education shows a decreasing tendency.

Table 3

The proportion of those enrolled in vocational education at the second level of secondary education by gender in the European Union (2001-2012)

Countries	Male		Female	
	2001	2012	2001	2012
EU28	-	55.7	-	45.0
Czech Republic	84.3	78.5	75.6	66.8
Denmark	60.1	51	48.8	41.2
Germany	68.8	55.6	57.3	39.6
Greece	40.1	39.6	30.3	26.1
Lithuania	39.1	35.8	25.7	20.8
Hungary	14.4	32.2	8.6	22.2
Austria	75.8	79.9	67.2	70.1
Poland	71.4	58.4	52.1	37.2
Slovakia	81.1	76.1	74.2	64.5
Sweden	52.4	51.6	51.2	47.5

Source: based on data by https://www.ksh.hu/docs/hun/eurostat_tablak/index.html, own editing

The most favorable situation can be found in Austria with a dynamically rising tendency of 79.9% with men, and 70.1% with women. The proportion is low in Hungary, though there is a growing tendency of 32.2% with men, and 22.2% with women. With this, we are significantly below the average of the EU's 55.7% with men, and 45% with women. Out of the countries of the Visegrad Group, the Czech Republic and Slovakia well exceeds the European enrollment rate in the case of men and women alike.

It is noticeable that the proportion of women compared to that of men is smaller in each country, which also shows that the ladies can choose from fewer vocations.

Table 4
 Educational data from Hungary from 1990 to 2014

	1990	2000	2010	2014
Secondary school students	142247	215500	241872	216373
Full-time secondary school students	123427	178500	198700	182233
Vocational school students	225356	126600	147340	109978
Full-time vocational school students	225356	125530	139237	100032
Students in adult education	-	1070	8103	9946
Students taking part in special education, in vocational education	3152	5200	10161	7643
Students who took part in vocational education	217287	294000	273596	221149
Full-time students taking part in secondary vocational education	168445	239300	240364	188762
Students studying in vocational school, in training year	7100	-	67943	48006

Source: based on data by www.ksh.hu, own editing

Secondary vocational education

After the change of the regime, the number of students increased in two types of secondary school, there were 216,000 students in the grammar schools, and 221,000 students in the vocational schools in 2014. In the technical schools, however, by 2014 the number of students dropped to its half, to 110,000 students, compared to the number in 1990. In the past 4 years, the number of those taking part in secondary day education has dropped by more than 100,000, from 578,000 to 471,000. Also the inner structure has changed, but not along with the regulation intentions appearing in the laws where the number of grammar school students was to be decreased, and the number of vocational school students was to be increased, but just the other way round. It also shows the popularity of school types with the public. As far as secondary education is concerned, the proportion of students studying in grammar schools was 34% in 2010, which increased to 38.7% by 2014. The proportion of vocational school students decreased from 42% to 40.07%. The number of those taking part in secondary vocational daily education was decreased by 40,000 in 4 years. In spite of the different measures, the appeal of vocational education decreased further, and to become a skilled worker means even a less attractive perspective.

The proportion of those learning at technical schools, 24% which is already considered low in Europe, decreased to 21.23%.

During the process of retailing the Hungarian vocational education, the rhythmicity of continuity and change was broken by a “philosophy change” in 2010, which also triggered a division between professionals. “The new vocational education structure which takes a shorter time and contains more practical training, does not give enough time to develop the key competencies.” (CEDEFOP, 2011).

A short retrospect follows about the antecedents:

“... after the change of the regime, a vocational education of supplementary type, compensating labor force market demands and built on complete employment, was determinative. It was a specific dual system based on the co-operation between schools and companies.” (Benedek, 2002).

Half of this age group studied in this type of school, the solution to the demographic peak was also found here in the 70s. The industrial, agricultural, trade, catering, health care and typing trainings were characteristic. “Together with the collapse of large industrial production, also the oversized, over-specialized vocational training systems of the region got into critical situation, since a large number of practice places at companies ceased.” (Lannert, 1997). By the turn of the millennium, the traditional training system of vocational school was not viable any more, conscious and accidental structure change started. More and more school pilot projects were going on. “It is characteristic in Hungary that vocational training centers were made beside secondary vocational schools, built on maturity exam, and secondary technical schools. Training offers increased by leaps and bounds. Private schools were also set up. New fashion trades were formed, especially in the service sector. Characteristically in this period, economic and financial professions, language knowledge and the knowledge of IT tools were appraised.” (Sós, 2006). We took part in many EU pre-joining programs, getting to know the vocational training systems of other countries. “There are different vocational training models in the European Union: day school education and practice together, dual education, which mostly spread in Germany, where the vocational training of the students is shared between the school system and the practice place of work, and also models of mixed type.” (Fedor, 2001). In 1993 the vocational training law and the public education law were born, a year later the Vocational Qualification System and the National Training Register were introduced. The first National Core Curriculum (NCC) was accepted in 1995, but in the modification of 2003, and all the more so in the one of 2007, the emphasis was placed on the requirements, but the schools were consigned to make the local curriculum. It’s also a significant issue, because “the curriculum on the one hand is a

pedagogical document, on the other hand it is also a document of educational control, educational policy.” (Báthory, 2000).

In the case of the 2012 NCC a reverse process took place: learning material and knowledge-centeredness were primary. Curriculum frameworks are divided by school types, the basic target of NCC that the students have an integrated basic education, is made impossible to achieve. NCC was originally also important for vocational education because in it an integrated “national minimum”, independently of the type of institution, the knowledge to be taught and learnt was expressed, it opened the way for the vocational training institutions to become a real secondary educational institution. It meant a guarantee for “interoperability”, for acknowledging prior knowledge. “The traditional subject approach of the Hungarian school system was changed for the integrated approach of learning content.” (Pócze, 1995).

The “characteristic feature” of the 90s and of the turn of the millennium is the decreasing number of the school-age population, training time became longer and longer. The expansion of secondary schools, then of higher education was noticeable. In the market oriented education, the decline of vocational schools replacing technical schools was characteristic. The consolidation of vocational education was going on within a more and more detailed legal and financial framework, in the meantime, the market economy formulated its demands and expectations more and more explicitly. The shortcomings and dysfunctions of the half-new regulations and old routines became more and more obvious.

“We received significant application grants before joining the EU, too e.g. in the framework of a vocational school development program, they were realized with different efficiency.” (Sós, 2006). The profession policy eventually responded to the challenge of the Copenhagen syllabus in the spring of 2005.” (Horn, 2009). “The most important element of modernization is modularization.” (Nagy, 2005). This quality education was helped by variegation, flexibility, transparency, interoperability, things that were built on one another, with which a modular system was created. The new National Training Register was approved in 2006. New vocational and exam requirements (VER) were set up. The vocational, social, personal and methodological competencies and exam requirements were defined. Some initial steps were taken to improve the efficiency of the fragmented vocational school system by the “Dutch model”, to develop common training workshops. In analyses and at conferences of the time, issues which are still unsolved today were raised: the lack of teacher policy in vocational training, the problem of the underprivileged, the situation of Roma, dropouts, increasing the social prestige of vocational education and vocational training.

3 Vocational training and quality in international comparison

In my research, I build on the mathematical, reading comprehension and natural science measuring of OECD-PISA involving the most developed countries, which has taken place since 2000 every three years, and covers 15-year old students.

In the followings, through a characteristic example, I will compare the mathematical performance of several countries.

Table 5

The average result of European countries based on mathematical performance

Average result		
Countries	2000	2012
Czech Republic	498	499
Denmark	514	500
Germany	490	514
Greece	447	453
Lithuania	-	479
Hungary	488	477
Austria	515	506
Poland	470	518
Slovakia	-	482
Sweden	510	478

Source: based on the database of www.oecd.org/pisa OECD-PISA 2000-2012, own editing

Out of the countries discussed, Austria, Denmark and Sweden produced the best indicators in 2000. The emersion of Poland in 2012 deserves attention. Behind the numbers you can observe this: “Poland introduced an educational reform in 1999, they created the National Core Curriculum, increased the independence of schools, developed an external evaluation system, made their elementary schools uniformly 9 years long. The performance clearly improved in education, in vocational schools, as well, but at the same time it did not get any worse in secondary grammar schools. The difference between students decreased.” (Ostorics, 2015). In Hungary an adversary process is going on, with significant state centralization. The different regulation changes do not show noticeable

improvement in the different measuring indicators of education. Hungary can be found lagging behind the other countries in the comparison. Slovakia, with better indicators, is still in the second half of the evaluated groups. The comparison between The Hungarian vocational training and that of western European, Danish or German, is difficult to make, because the students of those countries take part in dual education starting from different basics. In the countries mentioned, usually they created a school structure which makes 9 or 10-year long elementary education possible. “The students gain more knowledge in the elementary education, e.g.: 65% of the Danish students speak English, in Hungary that is 0.8%.” (Köllő, 2011).

Table 6
 Average results of OECD-PISA surveys (2000-2012)

Competency	2000	2003	2006	2009	2012
Mathematics	488	490	491	490	477
Worst and best results by countries	334-557	359-550	311-549	331-600	368-613
Reading	480	482	482	494	488
Worst and best results by countries	-	375-543	482-551	314-556	384-570
Science	496	503	504	503	494
Worst and best results by countries	375-552	357-548	322-562	330-575	373-580
Computer based mathematics	-	-	-	-	470
Worst and best results by countries	-	-	-	-	387-566
Digital reading	-	-	-	-	450
Worst and best results by countries	-	-	-	-	396-567

Source: based on the database of www.oecd.org/pisa OECD-PISA 2000-2012, own editing

Hungary usually achieved an average result during the 12 years (Radó, 2013). However, in the case of the survey taken 3 years ago a setback occurred in all three areas, mathematics, reading and science. The biggest fallback came in mathematics. It is also worrying that digital reading lags behind the international average. Trying to find the reasons, I can highlight the decline of developing

competencies on the one hand, and on the other the family background which is continuously getting worse due to the long-continued crisis, especially technical school students drop behind significantly. In an international overview, in most of the cases China, Japan, Korea, Singapore, far-eastern countries are at the top of the list, from Europe Finland is there. Among the last ones Kyrgyzstan, Azerbaijan, Tunisia, Argentina and Colombia can be found (www.oecd.org/pisa OECD-PISA 2000-2012).

Competency surveys in Hungary between 2000 and 2014

Table 7

Competency survey according to performance and educational forms in the 10th year in 2014

	Mathematics	Reading
All students	1660	1627
8 year grammar school	1842	1802
6 year grammar school	1825	1781
4 year grammar school	1734	1715
Vocational school	1627	1592
Technical school	1450	1397

Source: www.oktatas.hu National competency survey 2014, based on the National report, own editing

I would like to highlight the measuring considering the 15-year old students, especially from the point of view of technical schools. In the last years, competency based education has declined in Hungary, the learning material centered pedagogical work got into the foreground, the National Core Curriculum was extended with encyclopedic knowledge. The performances clearly show that the Hungarian secondary education is still hierarchized, the situation has not improved recently either, moreover, it is showing a worsening tendency. In both surveys, the results of the technical school students significantly lag behind the average of their age group.

The number of early drop-outs in Hungary is increasing

Table 8

The proportion of early drop-outs in Europe between 2010 and 2012

Countries	2010	2011	2012	2020 target
EU 28	14.0	13.5	12.8	10
Czech Republic	4.9	4.9	5.5	5.5
Denmark	11.0	5.6	9.1	10
Germany	11.9	11.7	10.5	10
Greece	13.7	13.1	11.4	9.7
Lithuania	8.1	7.2	6.5	9
Hungary	10.5	11.2	11.5	10
Austria	8.3	8.3	7.6	9.5
Poland	5.4	5.6	5.7	4.5
Slovakia	4.7	6.0	5.3	6
Sweden	6.5	6.6	7.5	10

Source: www.ksh.hu, Eurostat data, EU labor force survey (EU LFS)

Note: Early drop-outs: the proportion of those among the 18-24-year old who only have the maximum of elementary education and in the 4 weeks prior to the survey they didn't take part either in school education or in adult training.

Dispersion is big between the countries discussed, and the EU average is quite high with early drop-outs, it was 12.8% in 2012, and the target is 10% for 2020. In the Visegrad Four countries Slovakia (5.3%), the Czech Republic (5.5%) and Poland (5.7%) can boast with extremely good results, at the same time Hungary's index number is 11.5%, twice as much as that of the others. Moreover, there is a big difference between the Hungarian regions. This number was 8.5% in central Hungary in 2012, and it was 15.5% in northern Hungary, so the difference is 7%. In 2013 in northern Hungary the proportion of early drop-outs was 18.8%, and it was only 7.7% in central Hungary. The difference is 11.1%, which shows a growing tendency (Mártonfi, 2013). Considering education, employment, unemployment and poverty the country presents two areas of different development.

There is a significant difference in average results by the types of settlement as well the conditions of accessing education are not equal.

Table 9

The average results of students in their 10th year by settlement types

	Mathematics	Reading
Village	1509	1425
Town	1599	1565
County capital	1653	1619
Budapest	1672	1640

Source: based on www.oktatas.hu OKM 2014 national report, own editing

Students in small settlement schools or ones in big town schools do not have equal access possibilities to good quality, majority education. Both surveys support the tendency that the capital city is in the most favorable situation, afterwards come the county capitals, followed by towns, and the villages come last. The Hungarian school system selects on the basis of who lives where, too. For the vast majority of youth living in villages the technical school is offered as a possibility.

Family background greatly influences the performance of students

Table 10

Hungarian average results depending on what kind of family background the student has (10th year, 2014)

Cumulatively underprivileged	Proportion of families	Mathematics	Reading
YES	4.6	1447	1398
NO	95.4	1640	1607

These figures highlight that the result of the cumulatively underprivileged young people having bad living conditions significantly lags behind the others. The educational system on its own cannot lessen the social handicaps of students, it segregates. It is a significant problem in the case of the cumulatively underprivileged youth, first of all the young Roma.

4 Vocational training frameworks, enrollment directions and proportions

Today “permanent” changes are going on in the field of vocational training. Since 2011 uniformly a 3-year training has been created, in this period the age limit for compulsory education decreased from 18 to 16 years of age, thus it is not connected to any completed school qualification. This may boost early dropping-out, and it also limits the access possibilities to training. The time to be

spent for key competencies has significantly been decreased. The time available for mother tongue communication education and mathematics competency development has been reduced to its half. In the case of scientific and technical competencies, two thirds of the lessons have been taken away. Digital competency development and IT education have lost ground; they have been put into the freely usable lesson framework. In the 9th year the weekly number of general knowledge subjects is 18, the number of vocational theory and practice lessons is 17 a week. In the 10th year these figures are 11 and 25, whereas in the 11th year they are 9.5 and 21.5 lessons for the good of practice. In all years the time framework is 33%, as defined in the National Core Curriculum. In the technical school training the vocational training curriculum framework is provided as qualification for vocational theory, or for vocational practice training going on in the school workshops, or at business organizations. In the secondary vocational schools in the 9th-12th years in each study field the regulation applies to vocational theory and practice. As qualification, in the vocational training year following graduation it covers vocational theory and practice (Act CLXXX VII. of 2011 law about vocational training).

Following the change of the regime, the National Training Register of professions has been comprehensively changed 3 times; the integrated system was created in 1993, after a two-year preparation work a modern, modular NTR was approved in 2006. It was followed by a new modification in 2012, when the number of professions was halved (150/2012 (VII.6.) Government Decree about the National Training Register, and the rules of procedure about the modification of the National Training Register). The circle of adult training and school training was reduced by the forms of training, since there are professions which can exclusively be trained in the course of adult training or just in school type education. With this the access possibility to vocational training got limited. 489 vocational trainings, 149 partial vocational trainings, and the follow-up vocational trainings were specified. I will highlight two characteristic fields from them, the carpenter N°34 secondary qualification, and the advanced electronic technician N°54 (27/2012 (VIII.27.) Decree of the Ministry for National Economy about the exam requirements of qualifications falling within the competence of the Minister for National Economy). N°34 carpenter profession is a secondary qualification, which is built on elementary school qualification, or on vocational and input competencies defined in the exam requirements, and can typically be achieved in vocational school training. It belongs to the architectural vocational group; the general exam activity of the other professions is similar, apart from some specifications. In the framework of the career mirror 12 jobs which can be done with this qualification were defined. The system of requirements is defined in 45 paragraphs, which are given in modules. The advanced electronic technician N°54 belongs to the electronic vocational group; the career mirror gives 8 jobs which can be done with this qualification, from the

energy distribution technician to the lighting technician. 21 paragraphs define what people who get this qualification can do. Qualifications N°35 and N°55 are the so called follow-ups.

“Almost all essential regulators of vocational training were significantly modified, including, beyond the National Training Register, the curriculum framework and the vocational exam requirements.” (Tóth, 2014).

The condition of letting someone take the complex vocational exam is a successful exam at the end of a module. In fact, this has become a formality by the verification of accomplishing the different years. According to the new regulations, there is no possibility for acquittance, for taking prior knowledge into account, or for the training to be shortened. Actually, the modular system has become a formality. There is a contradiction, too, that in principle the competencies are worded in the documents regulating vocational training, however, in practice at the exam questioning is carried out according to the subjects. The vocational school branch has been defined in 37 fields, from health care to sports (NMH, 2014). In the new secondary vocational school form one can get prepared for obtaining a secondary vocational school certificate in two different ways. As it is defined in the NTR, one way is that the vocational training is carried out by the preparation for the complex vocational exam. The other possibility is open for those who do not have a vocational final exam of the vocational branch, but they do have a regular final exam. The new form mostly raises problems similar to one in vocational training, with vocational school students. Among others, in many cases, the professional practice close to the actual labor market is not solved either.

The characteristics of the special vocational school (NMH, 2014): According to the law about vocational training, the student cannot be part-trained in a vocational training school, unless the training is carried out in the framework of the Public Education Bridge Program, regulated in the law about public education, or also in a special vocational training school, or in a special skills development school, to obtain part-qualification. This kind of training is for the hearing or seeing impaired, for the disabled and for those having learning difficulties. These students are helped to get prepared by the adaptations of curriculum framework, whereas in the BRIDGE II program there is no need for such specialization. “The most important reform of the past few years was probably the introduction of the vocational training for the students with special educational needs in 2006.” (Mártonfi, 2011).

5 Decisions concerning the vocational structure

An important tool in the short run is the system of vocational structure decisions, in the series of measures influencing vocational training, operating since 2008. Vocational training directions, training proportions broken down by counties, were defined in government decrees. The definition of vocational trainings supported by vocational school scholarships is done on the basis of this. There is no guaranteed employment possibility for those who learn, based on government support, a profession badly sought-for. In the case of decisions concerning the vocational structure the emphasis was primarily placed on employability, one important instrument of which is the NTR, which through building on one another, interoperability, acknowledging prior knowledge contributes to lifelong learning, and to employer mobility. The realization of these principles is limited by the operation of vocational structure decisions in the form of the present decree (Sós, 2015). The scholarship programs connected to trainings for the sought-for professions distort the relationships of offer and demand on the labor market. With this the state assists to beat down wages which are low anyway in Hungary.

Table 11

Number of students participating in practical training with student contract in Hungary between 2003 and 2013 (in thousand persons)

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Persons	14	16.4	21.3	35	37	44	46	48	49	49	50

Source: Based on data supplied by the Hungarian Chamber of Commerce and Industry, 2015, own editing

“In the vocational training year the student is trained at a business organization under a written training contract concluded between the student and the organization for the practical training.” (Kajdy, 2015). In the past 10 years, the number of students in a contract has grown by 36,000 persons. In the past few years, this early dynamic growth has slowed down. The target is to achieve, due to the effect of various incentives, the number of 70,000 youth supported by student contract within a reasonable time.

About the vocational training contribution

In 2011, in the field of vocational training and contribution, an essential modification was realized (Act CLV of 2011 about the vocational training contribution and about the support of the development of training). In 2015 the modification of the law highlighted the support of SMEs in this respect (Act .LXVI.of 2015 about the modification of Act CLXXXVII of 2011 about

vocational training, of Act LXVII of 2013 about adult education, and of acts connected to them). For 2012, a basic norm of HUF 440,000/person/year was fixed (280/2011. (XII.20.) government decree). In the years after this, the basic norm is fixed in the Budget Act. In 2014 it was HUF 453,000/person/year (Act CCXXX.of 2013 Budget Act). This sum has to be determined on the basis of the weight multiplier product of the vocational group belonging to the vocational qualification named in the student contract. The weight multipliers vary by vocational groups in the National Trade Register. In 2012 the lowest weight multiplier was 0.6160 in environment protection – water management; the highest one was 1.2882 in mechanical engineering. Bigger companies have further possibilities, from 2013 further on again, where there are at least 45 students with contract, companies can decrease their gross expenditure with the training costs, but not more than by 15.6%. Nowadays newer changes are in process.

The modification of the vocational training law of 2011 and of the adult education law of 2013 in 2015 (Act .LXVI.of 2015 about the modification of Act CLXXXVII of 2011 about vocational training, of Act LXVII of 2013 about adult education, and of acts connected to them)

The modification was founded in “Vocational training in the service of the economy”, a government concept (13/2015.II.10.). A few significant modifications: not one, but two vocational qualifications are available for free. Obtaining the second qualification, supported by the state, can only be realized in the framework of adult education. Today, not at the age of 21, but only at the age of 25 a young person can start training in adult education. In vocational training schools maintained by the state an educational leader of practice has to be employed. To decrease the number of drop-outs, new vocational training bridge programs will be introduced. The role of the Hungarian Chamber of Commerce and Industry has increased, e.g.: in the qualification and control of practical training places. The vocational training schools getting into the maintenance of the Ministry for National Economy (MNE) is organized into centers, they take over the role of the Regional Integrated Vocational Training Centers (RIVTC); the system of institutions is also modified. Starting from the educational year of 2015/2016, the vocational training schools will be special vocational training schools. Their new name is secondary vocational school, which will last for 3+2 years, if the students opt for this possibility, they can get prepared for a secondary school graduation. The secondary vocational schools will become vocational high schools, lasting for 4+1 years. Starting from the educational year of 2019/2020, the vocational graduation will not only entitle the students to fill in a job, but it will be qualified as a NTR qualification, too (www.csmkik.hu). Those who organize practical training based on student contracts will have an opportunity to deduct a certain amount of their cost of investment necessary for pursuing practical training.

6 The perspectives of state engagement – dual vocational education – skilled workers

In the period discussed, state engagement considering education has significantly decreased in GDP proportions and in nominal value, too.

Table 12

State educational investments in Hungary (2003 – 2012)

Index	2003	2012
Educational expenditure total in GDP percentage	5.69	4.08
By the level of education		
Kindergarten	0.84	0.66
Elementary education	-	1.40
Secondary education	3.28	0.80
Tertiary education	1.10	0.88
Other	0.47	0.35

Source: www.ksh.hu Educational expenditure in the percentage of GDP 2003-2012, own editing

Note: Educational expenditure in the percentage of GDP shows the total educational expenditure of the state in the percentage of GDP. The index of input character measures the changes of investments invested in human capital. Between 2003 and 2012 the educational expenditure taken by the state decreased from 5.69% to 4.08% in the percentage of GDP. In the case of secondary education, the change is dramatic, the sum spent on this field shrunk to its quarter, it negatively affects the system of conditions of secondary grammar schools, secondary vocational schools and secondary vocational training schools. After 2010, the modifications implied source withdrawal, e.g. decreasing the age limit for obligatory education, making vocational training 3-year long generally, central control. All this means a competitive disadvantage in international outlook in the period of knowledge based society, and asset intensive pedagogical work.

Dual vocational training and economic role players

The primary objective in the transformation process of vocational education after 2010 was to make young people to get in direct touch with the world of work as soon as possible. 8,000 enterprises deal with vocational education in Hungary in 2015. About 4% of the business organizations take part in educating students. The objective to achieve in the next 4 years is that the number of companies in this field is 20,000 (based on data supplied by the Hungarian Chamber of Commerce and Industry, 2015). Basically, even today, vocational

training is carried out in school education, in workshops. Only an insignificant number of entrepreneurs carry out vocational training. “Companies are not committed enough to vocational training at companies, and company strategies are made for shorter terms, rather than for longer terms.” (Horn, 2014). It’s true about the Hungarian SMEs, but also about a big proportion of bigger companies, that they spend their daily energy on helping technology, and not on long-range development. After 2015 the incentives change, by which the direction of these factors is indirectly acknowledged. Companies join in vocational education in the course of practical training, which is done on the basis of a cooperative agreement, or of a student contract. In the framework of dual training, the education of theory is done at the school, and practical training is carried out at the companies. A division of labor was formed between the state and business life in vocational education. This has got antecedents in Hungary. Today, besides governmental factors, ministries, also the Hungarian Chamber of Commerce and Industry has possibilities and significant responsibility in the field of vocational education. The Chamber gradually takes over governmental tasks based on government agreements, e.g. the supervision of conditions of vocational education and of student contracts, the operation of the county development and training committees. The German dual education is considered a model.

At the same time, it can be seen that dual education is not all-powerful, especially not so, since proportionately few companies take part in it. “No one has been able to point out a tight causality between dual education and the success of youth in the labor market.” (Horn, 2014). What is more, in the past few years, also the shortcomings of the German system have been manifested. “Due to the lack of interest and the shortcomings of practice places, similarly to Hungary, considering dual education an all-powerful tool contradicts to our traditions and to the present development level of the economy operated by the private sector, and to its ability for cooperation.” (Benedek, 2015).

Table 13

Labor cost – Total hourly labor cost in Euros in Europe between 2000 and 2014

Countries	2000	2014
EU28	16.7	24.6
Czech Republic	-	9.4
Denmark	27.0	40.3
Germany	24.6	31.4
Greece	11.7	14.6
Lithuania	2.6	6.5
Hungary	3.6	7.3

Austria	-	31.5
Poland	4.2	8.4
Slovakia	2.8	9.7
Sweden	-	37.4

Source: based on data by https://www.ksh.hu/docs/hun/eurostat_tablak/index.html, own editing

Note: The average hourly labor cost is the cost which is defined as the quotient of the total labor cost and of the number of working hours worked according to it.

In 2014, the total labor cost was 24.6 euro/hour as the average of the EU28 countries. This was three times as much as the Hungarian average (7.3 euro/hour). In Slovakia the situation is more favorable. For the same work they pay the most in Denmark (40.3euro/hour) among the countries discussed. EUR 31.4 is paid in Germany, and the least (EUR 6.5) is paid in Lithuania. This situation significantly influences the willingness of Hungarian job seekers taking up a job abroad. Dispersion is big, it can be seen well that the former socialist countries lag significantly behind.

In Hungary, the employment perspectives of good skilled workers are not favorable either. In Hungary the gross average salary in the economy is HUF 242,700 in February, 2015. It's HUF 323,583 gross with white-collar workers and HUF 157,617 with blue-collar workers (www.ksh.hu/beradatok). Probably, these salary conditions also influence the different professional fields, for which sometimes it's impossible to find a good skilled worker. What's more, the income and promotion perspectives are not favorable either.

It is necessary to increase the prestige of teachers-trainers in vocational education

In the case of young people coming from an impoverished environment the shortcomings of the family background also have to be made up for, this is a serious pedagogical challenge, it's difficult to find a good professional for the education carried out here, and the teachers and students are not appreciated. Also in this field, the conditions are imperfect.

7 Conclusion

Based on a research built on the document and statistical analysis, in connection with the examined statements, the following major statements can be made.

7.1

A lot of similarities can be observed in the European Union member countries in

the fields of vocational education, employment and social activity. Vocational education has lost some of its appeal. The proportion of participants in vocational education, and the number of career-starters have continuously been decreasing in the countries discussed. A general tendency in Europe is that the demographic factors are unfavorable, in most of the countries there is little skilled labor force, which may adversely affect the economic growth, too. In its vocational education policy the European Union sets aims, it respects the specialties of the member states in its contents and organizational build-up. In Hungary, in the past 4 years, the different new regulations concerning vocational education have not resulted in positive changes; in fact, the proportion in secondary education has changed to the injury of vocational training. Companies, employers, customers complain about the missing skills with skilled workers. The crisis, in connection with the employment of youth, is even more noticeable. With higher school qualification the employment possibilities are more favorable.

7.2

The hierarchy of secondary education, its social replication, where vocational education is at the end of the line, will lead to the shortcomings of quality of vocational education. The changes of regulations haven't brought on the improvement of performance. All this can be seen in the OECD-PISA surveys in international comparisons, and also in the Hungarian competency surveys. Almost in every field, a decline has occurred. The reasons can basically be led back to the unfavorable changes of the circumstances, to the increase of social disadvantages, to the deterioration of the condition systems of training. Most recently, under these conditions, the difference between students has increased. Vocational education and adult education may have a significant role in bringing back early drop-outs into education, and in giving them a profession within a reasonable time. But for all these, we need to strengthen key competencies, to develop basic knowledge, and also to improve the systems of conditions.

7.3

Analyzing the National Training Register, the Vocational Exam Requirements, the curriculum framework, one can clearly see that the competency principle is defined at theoretical level, but at the exams questioning is done by the subjects taught. The evaluation of the vocational exam according to the NTR in 2006 rather built on the evaluation of the vocational, social and method competencies. On the other hand, the vocational requirements of the complex exam involve these competencies, only one mark is given, thus the evaluation of these fields is not taken into account, though the requirement level prefers this. The introduction of the complex exam de-emphasizes the evaluation of competency fields, and fits less to the modularity of the curriculum framework. The modular system has become a formality by the vocational education's legal regulation in

force. Interoperability between qualifications has ceased, or become more difficult. Thus in practice it doesn't make it possible to take prior knowledge into account. The central, content control of vocational training schools resulted in the teachers' possibilities of 10% scope of action in teaching learning materials, which is not enough. The shortened, 3-year long vocational training has been made universal, and the emphasis was laid on the demand-supply training. The efficiency of the vocational structural decisions made annually by means of regulations is questionable. It has not brought on expansion among career starters, and does not mean a guarantee for employment either.

7.4

The frequent changes of regulators have not brought on a "breakthrough", so far the motivation of the economic role players to take part in vocational education has been missing. The incentives have not become substantial, the financial engagement of the state in education has continuously been decreasing; the formerly successful German dual vocational training has become antiquated, too. It is not useful to one-sidedly force dual training, it can only be realized where its conditions are created. So far it has not been proved that the centralized system is more efficient than a decentralized, many-colored, flexible, interoperable, cascading system.

The European Council defines the following objectives considering vocational education until 2020: lifelong learning, mobility, improvement of quality and efficiency in the field of education, equity, social cohesion, active citizen engagement, creativity, innovation, entrepreneurial activity (Education and Training 2020).

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ARTICLES

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 unfavourable 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 labour market. Therefore, it will support the education leading to the development of job skills of primary school pupils to ensure professional orientation of students, particularly at secondary vocational schools.

The importance of technical education for the overall development of children is discussed in relation to the preparation of students to study at secondary vocational schools. A successful completion of topics in the subject of Technology at primary schools (PS) is a prerequisite for an easier transition of pupils to secondary vocational schools.

Key words: education, technical education, school reform, educational standards.

1 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

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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, there was 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.

These negative trends culminated after 2008. The 2008/2009 school year saw the beginning of the implementation of a school reform according to which the subject under the name Technology was to be taught only in the 7th and 8th grade with the time allotment of 0.5 hours per week. Additional adjustments occurred during the school year 2011/2012. Since that time the subject has been taught only in one school year between 5th and 9th grade with just one lesson per week. At the pre-2008 primary level (ESCED 1), technical education was taught in the 4th grade as the subject titled Work Education in the scope of 1 hour per week (Pavelka, 2013).

The system of technical education in Slovakia, approved by the Ministry of Education, Science, Research and Sport of the Slovak Republic and implemented through curriculum, caused discontent in part of professional public, provoking expert discussions and various activities aimed at changing the given 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 the society at large:

- Disinterest of primary school graduates continues after the completion of primary school studies at secondary vocational schools and then at technical universities;
- Companies begin to lack qualified specialists for manufacturing, construction and services;
- Graduates leave primary schools with a minimum of knowledge in technology – being practically technically illiterate. The same situation can be applied to graduates of secondary grammar schools;
- 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:

- The Government considers education, science, research and innovation, computerization and digitization to be essential pillars of the knowledge-based society and economy;

- It realizes that Slovakia's competitiveness depends on the competitive people who are educated, skilled, creative and adaptable;
- The Government will create conditions for strengthening of education in fields of science and engineering;
- The Government will gradually innovate the state educational programs according to the new priorities of state education policy by current requirements of teaching experience, beginning with technical education at primary schools – bringing the content of education and training systems to current labour market needs;
- Therefore it will support the introduction of education towards the development of working skills of primary school pupils in order to ensure professional orientation of pupils, specifically to study at secondary vocational schools (Government Manifesto of the SR, 2012).

2 The Mission and Tasks of the Man and the World of Work Subject Committee

In 2012 the management of the State Pedagogical Institute (SPI) in Bratislava restored the operation and activities of subject committees, which shall be established as an advisory body to the Director of SPI. The mission of subject committees is to participate in the discussion of the concept, research, and professional, methodological and other tasks related to individual educational areas and subject areas of expertise at different levels, kinds and types of schools and school facilities (Principles for the establishment and operation of the central curriculum committee) (Kozík, 2013a).

In 2013 the Committee analyzed current situation in the technical education and proposed changes to address inappropriate developments in technical education in Slovakia. In the analysis, the authors' (Members of the Man and the World of Work Committee) attention was focused on the following problems:

- Why it is necessary to teach Technology;
- Technical education and school reform;
- Technical education from the perspective of EU recommendations;
- Historical development of technical education in Slovakia;
- Reasons for making changes in the Man and the World of Work educational area;
- Manifesto of the Government and Technical Education;
- Proposed action to change the status quo (Kozík et al, 2013).

3 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 a

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 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.

Daily life brings a lot of new information, problems, practical activities and tasks for pupils at school to communicate in an integrated form, for example as model situations. Teaching experience confirms that the practical creative activity is important for healthy and natural development of children, allowing them to be authentic and objective in learning about the outside world and giving them a good feeling, the necessary self-confidence, self-realization, new attitudes and values in relation to people, work, technology and the environment. Technical education at primary schools is the first opportunity of professional choice for children. It is a chance to become familiar with the most common tools, the basic procedures of working with different materials, with common problems of practical life and possible solutions. Technology lessons create opportunity for children to decide which activities are most interesting, so that they can focus on them in their further study and professional work.

The development of thinking in preschool age is significantly affected by handling operations with different types of toys. First, there are different simple puzzles. Later a baby starts looking for more complex toys. He/she finds technical toys based on composing or decomposing activities, e.g. game of building blocks in which a child designs real objects – models corresponding to reality. When working with technical toys, handling games, children develop their senses, thinking and ability to express themselves. It involves creating a strategy and objective of the work, considering first and then taking action.

Already in kindergartens there have to be created all the conditions ensuring child's personality development in all areas. Neglect of technical education for children's development, e.g. the development of imagination and spatial orientation, in the earlier years cannot be fully repaired at later stages.

Subjects with technical orientation are the most appropriate for the development of independent and creative thinking, not only at primary, but at lower secondary level as well, therefore it is important to preserve and promote the integrity of education at all levels of education.

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

- Technical spatial imagination;
- Technical, constructional, technological and technical creative thinking;
- Understanding of the applications of scientific knowledge in the operation of technical equipment;
- User-commercial thinking (which people often use in purchasing technical equipment and using them, e.g. in households);
- Information and habits of safe and hygienic use of technology in general;
- Manual habits and skills (for the processing of commercially available engineering materials), including skills to safely use tools and technical aids, available in large stores;
- The ability to implement cooperative and team-working teaching with an emphasis on experimental activities and implementation of projects in the field of technical products;
- Effective thinking and effective work with technical materials and equipment (saving materials and tools correctly and safely using appropriate technical equipment, environmental impact and disposal techniques, etc.).

The consequences of a destructive approach to the legislative conditions for the implementation of technical education at primary schools, which have been reflected in school practice since 1989, or, respectively, 1995, clearly show that the vast majority of current primary school graduates have significant insufficiencies with regards to the above mentioned points.

4 Technical education and school reform in the year 2008

The Slovak professional 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 2005, especially competence in mathematics, sciences and technology. According to the State Education Programme (SEP), technical education should be provided weekly with a half-hour time allotment in 7th and 8th grade. In the 5th, 6th and 9th grade, the technical education was only taught in case the school is focused on this area in their school educational program. Past experience shows that schools are more oriented on foreign languages, computing, and regional education and less on technology. The admitted Education Act allows this trend to continue also in the future. This makes general technical education for primary school pupils remote and inaccessible. They will be able to control their computers, but they will not have a basic knowledge of materials, raw materials, will not know the working tools for

working with wood, plastic, metal, will not be able to read simple technical drawing, make a product, will not be able to fix a bike, connect a simple electrical circuit, know the basic woodworking and metalworking machines and so on.

Neglect of technical education at primary schools has been going on for a longer period, especially since 1990. The reform in the year 2008, from which it was expected that it would at least partially improve the situation, was very disappointing for the teachers of technical education at primary schools. Again the teachers of technical subjects had to complement their amount of teaching hours by teaching other subjects.

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.

Currently, after various attempts, by senseless liquidation of district materials centres, the liquidation of technical, physical, but also professional and personal conditions at schools, society begins to feel the neglect of the general technical education at primary and secondary schools as a deficit in requirements of modern level secondary education and university studies in the technical field. From the school year 2008/2009 until the year 2015 the Man and the World of Work educational area (Working teaching, Technology, World of work), from the point of view of the Framework teaching plan (RUP) and elaborated goals, performance, terms and content of the SEP for ISCED1 ISCED2, is in absolute liquidation and in the worst situation in last 50 years.

Only fast and fundamental changes in the educational system, which will lead to the strengthening of the social status and quality of technical education at primary schools, can provide the perspective of maintaining and developing technical standards in Slovakia and thus the competitiveness of Slovakia in the EU (Kozík et al., 2013).

5 Technical education from the perspective of the EU recommendations

The European Council has set in Lisbon in March of 2000 the main strategic objective for the European Community – to achieve the state in which the EU becomes the most competitive and the most dynamic knowledge based economy in 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 Slovakia.

This goal has initiated the preparation, establishment and approval of Educational working programme in which goals of the education and training of the population were formulated, agreed on by the Ministers of the Member States of the European Union responsible for education and training.

Within the recommendations of the EU about basic skills that should be obtained by individuals in lifelong learning, there is in the third point besides mathematics and science also explicitly mentioned – technical skills. (Kozík et al., 2013).

6 Notes on the historical development of the technical education in Slovakia

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, Czechoslovakia, as one of the countries of the Eastern bloc, began to apply the principle of polytechnic education according to the Soviet education system. Polytechnic education is characterized as "education where the 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 so it 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 (Lukáčová & Bánesz, 2007).

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 and 8th grade it was allocated 0.5 hours per week. The name of this subject in relation to its content was misleading. By name, the subject should provide students with the knowledge and skills oriented on the basics of labour law, employment and training, labour market issues, career information, career decision-making strategies, job search and business fundamentals. This knowledge and skills are

lacking in the national curriculum. Despite that, they are an important part of primary education in the economically and culturally developed countries of Europe. For the part of pupils who finish their primary education, this subject would be the only way to get to know the problems of the labour market and their opportunity to enter it, job search methods, fields of study, kinds and types of jobs, small business opportunities etc.

In comparison of the final phases of development of technical education in the Slovak Republic with the EU countries, there are significant differences. Development in Slovakia has a regressive tendency, while in the EU the direction has developing character and pursues social requirements, a fact that does not apply to Slovakia.

In the evaluation of education in the EU we find more unifying objectives: understanding the role of science and technology in society, the balance between technology and the environment, the development of skills such as planning, implementation, evaluation, social ethical thinking, innovativeness, awareness, flexibility and business skills. The most important part of the educational content are: technology professions in industry and technology, safety procedures, ergonomics, design, construction techniques, evaluation of work results, history of technology, the ability to solve problems, evaluation strategies and the relationship between society and nature (Kozík et al., 2013). Slovak Republic in this area significantly lags behind the EU countries.

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:

- 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);
- 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;
- The subject with this name is clearly and unambiguously identifiable to the public;
- A similar approach to the naming of a technical subject can be found abroad;
- 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 subject (Kozík et al., 2013).

Ministry of Education, Science, Research and Sport of the Slovak Republic agreed to use the name Working Teaching for technical subjects in the 3rd and 4th grade of primary school and the name Technology in the 5th to 9th grade of lower secondary education.

7 The proposal of standards

While drawing up the content and performance standards the proposers (members of the Man and World of Work Committee) accepted the following starting points:

- 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;
- 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;
- in the proposal to apply a sequence: idea – design (project) – solution – product;
- create a balance between the theoretical basis and practical applications;
- propose the topics so that they meet present possibility of technical and material equipment at primary schools;
- focus attention on the application of ICT in teaching;
- in higher grades, include topics focused on advanced manufacturing technologies;
- in the proposal, the topics should be chosen based on the attractiveness for pupils as a way to achieve an increase in popularity of the subject;
- create conditions for the application of links among subjects;
- use clear, exact and concise expression (Kozík et al., 2013a; Kozík, 2013b).

7.1 The proposal of educational standards at the primary level of education in 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 digital literacy, 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 (Kožuchová & Vargová, 2013).

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, Fundamentals of 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 health and 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.

In the 4th grade, the pupils acquire the basics of preparing meals for special occasions, celebrations and preparing the invitations.

The thematic unit "Creative use of technical materials" in the 3rd grade is designed to work with paper and textiles. In the 4th grade pupils can get information about the production and properties of materials, especially wood. They learn teamwork on the product and they are able to discover new solutions. The thematic unit "Fundamentals of Design" is designed for the 3rd grade. The unit focuses on technology in transport. Young learners acquire knowledge about the basic design elements of aircraft, cars, ships and lifting equipment. The models constructed from a kit or from the waste material. The part of this thematic unit is traffic education. An important tool in the education is the bike and its maintenance, care of the technical condition of the bicycle and cycling. The topic is closely related with the development of mobility and travelling.

In the 4th grade pupils become familiar with electricity through the historical and modern communication tools, such as mobile phones, laptops, tablets and so on.

The thematic unit "Folk traditions and crafts" focuses attention of teachers and young learners on the manufacture of products related to folk traditions. We expect that this thematic unit will be very popular among teachers and pupils. (Kožuchová & Vargová, 2013).

7.2 Proposals of educational standards in lower secondary education in the Slovak Republic

In the proposed content and performance standards for 5th to 9th grade, the authors keep the principle that each thematic unit should be directed at practical activities of pupils.

Working Teaching in the 5th grade consists of five thematic units: Rules of school technical classrooms, Man and technology, Man and manufacture, Utility items and gifts, Choice of profession and labour market.

The content of the first thematic unit is focused on the health and safety rules in the school laboratories. A part of this topic are the rules in the workplace, the procedure how work is organized in laboratories, appropriate clothes, protective equipment and hygiene.

The thematic unit "Man and Technology" addresses the issue of finding an answer to man's relationship to nature and technology. The answers for the pupils should be able to justify the need and importance of technology in human life and society.

The third thematic unit "Man and manufacture" deals with selected production of technology processing of natural materials and the production of useful products. This unit builds on thematic unit "Folk traditions and crafts" taught in the 3rd and 4th grade at primary school. The pupils become familiar with the working tools, instruments and their use in the manufacturing of products from natural materials in accordance with established procedures.

Thematic unit "Utility items and gifts" has a direct link to the first degree of primary school. The purpose of the theme is the promotion of pupils' creative activity by the creation of utility items or gifts. Pupils make gifts and learn to express the idea of making the product of simple graphical design, but also learn to choose their own progress and use the right tools. What we also consider important is to acquire a sense of usefulness, self-realization and experience, which may help them decide on their future career choices.

It is suitable that next thematic unit is "The choice of profession and the labour market". By age 10 to 11, we consider it appropriate to start preparing the children for choice of their future profession with respect to the application in the labour market. Pupils will learn how to find information about jobs and job opportunities on the Internet (Lukáčová, 2013).

The 6th grade is thematically focused on the following units: Man and Technology, Graphic communication in technology, Technical materials and

processing technology, Electricity and electrical circuitry, Simple machines and mechanisms, and Work, occupation and employment.

In the first thematic unit, pupils gather knowledge about the process of the product creation throughout a cycle from an idea to implementation and to disposal of the product or waste. Pupils learn to explain the difference between invention, patent and discovery.

Pupils are taught the basis for the creation of technical documentation in the second thematic unit. They learn to view a single object when viewed from the front view or when shown the dimensions.

Properties of materials, technologies and suitable tools and instruments are contained in the third thematic unit. The result of the practical work of pupils in this case is a product formed by the combination of different materials.

Thematic unit "Electricity and electrical circuits" consists of two parts. The first part is about the production and distribution of electricity from the power source to the consumer. In the second part, named electrical circuits, pupils can create simple electrical circuits by using model kits.

In the fifth thematic unit, pupils gather knowledge about the simple machines and gears in mechanism using kits.

Thematic unit titled "Work, occupation and employment" is focused on information on occupations and professions so that this information could be used in the future when choosing high school (Lukáčová, 2013).

For the 7th grade, for the subject Technology, educational content of thematic units has been designed: Graphic communication in technology, Technical materials and their processing, Tools and equipment at home and Work and the law.

For the 8th grade, there are these thematic areas: Electrical household tools, Technical electronics, Technical production, Study preconditions for choosing the career.

For the 9th grade following thematic areas have been designed: Residential installation, Materials processing, Creative activities, Secondary schools and courses for the labour market.

The content of individual thematic units is designed in such a way as to teach pupils practical skills which can help acquire the habits of creative thinking. The

role and objectives of the technical subject in solving practical tasks are the increase of their interest in the technical work and technical professions. The further studies were focused on vocational schools and technical courses at universities.

Thematic units in 7th to 9th grade are built in such a way that pupils expand and consolidate the knowledge and skills acquired in the 5th and 6th grade. At the same time, they acquire new knowledge and information about individual thematic units.

The thematic unit "Tools and equipment" in 7th grade teaches pupils about machines and equipment used at home, and, depending on their propulsion, describe their operation and use. They can identify the dangers of machines and equipment and search the Internet for instructions for their operation and maintenance.

In the thematic group "Work and the law", which is included in the curriculum of the 7th grade, pupils learn about the importance of concepts related to work. They are able to explain roles of Office of Labour and what is the content and function of the Labour Code. They learn to explain the terms the price of labour, employment, unemployment, etc.

They learn about the work abroad and the risk of such work. Pupils learn to know the basic rights and obligations of workers and become familiar with services and institutions active in the labour market.

In the 8th grade, in the thematic unit "Technical Electronics", pupils learn to understand the construction of microelectronic components in an electrical circuit, and their function in various practical applications (diodes, transistors, integrated circuits, sensors and other components and wiring). They can describe the principles of signal transmission telecommunication equipment.

In the 8th grade, in the thematic unit "Study preconditions for choosing the career", learners are prepared for the choice of their future professional direction. Pupils are lead to the right decision about their future profession by justifying their decisions when choosing a future profession, discussing their personal and academic abilities to succeed in the chosen field and the need for lifelong learning.

Building on practical knowledge on production technologies obtained in the previous grades and from their own life experience, learners can further enhance their new knowledge and skills in the thematic unit "Creative activity".

In this thematic unit, pupils design a process of creation of the product depending on the range of materials and technologies available at schools.

The final thematic unit of 9th grade, titled "Secondary schools and courses", brings pupils more information about the topic, especially focused on secondary schools with technical studies. They learn to search for the references for graduates of the individual fields of study on the Internet (Ďuriš, 2013).

In 2014, the draft of the content of Technology at lower secondary level has been supplemented by thematic area called Household Economics.

After the editing of the educational standard, the subject Technology is divided into two thematic areas: Technology and Household Economics. Each is subdivided into different thematic units. The emphasis is on thematic area Technology. The school is required to teach the topics from the thematic area of Technology for at least two thirds of the total compulsory school subject time allocation in each school year, and no more than one third of the total compulsory school subject time allocation in the school year should be allocated to the thematic area Household Economics, according to the schools' material-technical and personnel conditions.

Household Economics thematic area consists of the following thematic units: Planning and housekeeping, World of work, Housework and household maintenance, Food preparation and nutrition, Handicrafts, Family preparation, Cultivation and breeding work (www.minedu.sk).

8 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 shift in 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 of education 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 desirable output. Draft amendments were not sufficiently prepared, scientifically

substantiated 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 (Kozík et al, 2013).

8.1 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 and production of technical products and equipment, everyday interaction with technology is unavoidable, whether as a consumer or user. This implies a clear conclusion that every human should be ready for the interaction with technology.

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 to become aware and to perceive the world of technology which will accompany them in their future lives.

8.2 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 also the 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 basic

criterion in choosing on the basis of the place of residence and the perspective of its 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 in the 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.

Nevertheless, the model of technical education in Slovakia in 2008 was not used enough at primary schools to prepare pupils for a specific future profession in a technical discipline. Its implementation was left to the decision of primary school, especially in its possibilities.

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, were usually not supported at primary schools.

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.

Finding an answer to this question is not easy due its complexity. Each school, including primary schools, has its own characteristics, which affect the final result of learning.

Technical education is a subject that provides plenty of scope for developing interdisciplinary relations with other subjects at primary schools and not excluding the non-technical subjects. Nevertheless, technical education, in its theoretical foundation, is based mainly on the science subjects of physics, chemistry, mathematics, biology, and these foundations transform into practical actions and skills of pupils. Students gradually perceive and connect natural phenomena with technical solutions and their use in accordance with the protection of nature and the environment. This will make them gain the ability of technical thinking. To what extent depends on the quality of the learning process. The final teaching result will mainly depend on the quality and creativity of the teacher – how he/she can create with students the technical products and lead them to the creative technical thinking. Accomplishments of students in technical education, that is, solving specific technical problems, although often very simple, create their deeper interest basis and relationship with technology, which influence the students' decision about their future professional orientation. According to the curriculum of the subject Technical Education in force until 2008, when teaching at the appropriate level and with teacher paying attention to students and not neglecting the practical application of theoretical knowledge, the student is able to independently produce a functional model and perceive the proper operation of technical equipment at home but also outside the home, in real life (Blažej, 2005).

Graduate of primary school prepared in such a way can continue on further studies at vocational school of engineering or electrical engineering or a related specialization, since at the beginning of studies in technical subjects he/she will meet with known concepts, which largely facilitates the transition between primary school and secondary vocational schools.

9 Technical design and creativity – the fundamentals of technical 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 are not able to formulate their own ideas, produce unconventional ideas and there is a 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. We support the opinion that when teachers of technical subjects focus their attention on informative, interpretative approach of intermediation of the curriculum, technical subject will continue to have educative character (Turek, 2011) and will not raise interest of primary school pupils in technology studies. We agree with this opinion because teaching based on facts loads memory and does not teach the pupil to use creative thinking approaches (Kozík & Handlovská, 2011a).

For this reason, technical education at Slovak primary schools under the current educational conditions should have its curriculum innovated by using different activating and engaging teaching strategies. This is to be understood as a problem, project or experiential teaching that supports their opinion, learning to take a position and supports the autonomy of pupils in the decision making. They should acquire these skills at primary school; certainly it becomes beneficial for them in their personal lives and in future occupations (Kozík & Handlovská, 2011b).

For positive educational outcome, it is important that teachers should have responsibility, supported by decision-makers in education, school leaders and parents of children, in introducing progressive strategies in education. If this is not possible, teachers will feel the social lack of appreciation of their work and it will not be easy to make the necessary changes in the strategy of teaching and to make the desired change in the interest of students in learning Technology. Currently, teachers of Technology must deal with material and technical training instructions (Handlovská, 2011; Kozík & Handlovská, 2011a, b).

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.

Methods of creative thinking acquisition can be achieved by creative project ideas by students, directly involved in the process of learning and giving teachers the opportunity to mediate theoretical knowledge and deeper understanding in an amusing way.

Development of creative thinking acquisition methods encouraging communication, cooperation, teaching students to use acquired knowledge in original way is needed. It provides individuals with possibility to apply their own opinions and ideas in teaching. Students are trained in concentration, commitment and learning to discuss. Furthermore, the use of these methods results in the willingness of students to solve tasks, encourages originality of their thinking and curiosity. Developing technical creativity on the lower level of primary schools can also increase the interest of children in studying technology and later to work in technical fields (Kozík & Handlovská, 2011a).

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 (Kozík & Handlovská, 2011a).

10 Conclusion

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.

Return to teaching Technical education at primary schools at the quality level required before 2008 can significantly contribute to the fact that the Slovak Republic will continue to be the country with advanced industry and high technical level with generation of active creative potential.

Learning to utilize creativity is not easy. Training of creative thinking is a long-term issue that requires an encouraging environment and professional approach. The application of creative elements in technical education is the way how to achieve an increase of students' interest in studying technical subjects and disciplines.

All the basics, whether theoretical or practical, as we have shown by comparing the curriculum of vocational subjects in the first year of secondary vocational schools (in some cases even in higher grades), are acquired by students at primary schools in the subject of Technical Education, which leads to fulfilment of the role and the importance of technical primary education. The curriculum is only part of the learning process to achieve technological literacy and positive attitude of students towards technology and their subsequent decision to proceed further in technical education at the secondary specialized schools and later at universities.

After 1990, the Slovak primary schools, given the development in the society, were not directed to support technical education at primary schools. The result of this situation was the approach to technological education at the end of the first decade of the 21st century where underestimation of the necessity of technical education for the development of society and its economic growth caused that the technical education at primary schools in the Slovak Republic was on the verge of extinction.

We believe that a return to the teaching of technical education at primary schools in the required quality at least to the same extent as before 2008 can make a significant contribution to enabling the Slovak Republic to remain a country with advanced industry and high technical level of production characterized by active and creative technical potential. The Ministry of Education, Science, Research and Sport of the Slovak Republic made a decision to upgrade the content and scope of technical education at primary schools for the school year 2015-2016. In accordance with the decision, technical training will be conducted in the subject called Technology in 5th to 9th grade of primary schools in the scope of 1 hour per week and for 3rd and 4th grade titled Working Teaching in the scope of 1 hour per week (www.statpedu.sk, 2015). This decision is a fundamental step and it has created conditions to make positive changes in the quality of technical education in Slovakia. The focus of the themes is very close to the technical education before the year 2008.

The success of this undeniably correct decision will depend on how attention will be paid to technical subjects by the Ministry of Education, Science, Research and Sport of the Slovak Republic, school managements, teachers and the children's parents.

With the support of the Ministry of Education, Science, Research and Sport of the Slovak Republic, it will be necessary that the primary schools at first return illegally cancelled classrooms for practical activities (workshops). Based on this, a functioning system for supply of equipment for the subject will be created. That subject is to be taught by qualified teachers of technical education. It is necessary that Ministry of Education, Science, Research and Sport of the Slovak Republic, in close cooperation with the universities' scientific departments, prepares future teachers and that teacher training centres elaborate and implement a system of lifelong learning of teachers of technical vocational subjects. It will be important that the State Pedagogical Institute (SPI) of the Slovak Republic, in close cooperation with professionals from public, university, and teacher sphere prepare and constantly address innovation in the curriculum. All this should be in accordance with the latest knowledge of educational science, development, manufacturing technologies, IT technologies and requirements of practice, with the results of the solutions promptly applied in the educational system.

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Mathematical Literacy as an Essential Criterion of Healthy Personality Development and of Effective Education with an Emphasis on Class Climate

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Abstract: Personality development is determined by several factors; we have focused on the effect of mathematical literacy. Gaining new knowledge and skills not only from mathematics is influenced by class climate and the environment in which the educational process takes place.

Key words: mathematical literacy, class climate, effective education, functional literacy.

1 Introduction

Mathematics is one of the most difficult sciences, with respect to skills necessary to cope with it. Logic, logical thinking, spatial perception, exact thinking, accuracy and concentration are not always a matter of course in students with mathematical literacy. Therefore, the focus is on the question of primary and secondary school students' level of knowledge of mathematics. Within the professional circles, the difficulty of the A-level in mathematics and even its change to a compulsory graduation subject is discussed vividly. Understanding the mathematical skills is a prerequisite for study in technical fields.

Mathematics is regarded to be the language of technique. The problem of the decreasing level of mathematical knowledge is transferred not only into higher level of education but also into practice. Weakened mathematical and scientific literacy lately arise as one of the principal obstacles in technical fields' development. The above mentioned trends are also confirmed by the PISA, TIMSS international research. The specific ability to learn certain activities necessary to human life is regarded to be the general definition of literacy by professionals. Among professionals, this term is often replaced by the term "functional literacy", whereas the term refers not only to acquire certain skills and knowledge developing personality of an individual, but also the ability to practically use that knowledge and skills in real life. According to various theoretical perspectives and views, we distinguish between several kinds of

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literacy, e.g. financial, numerical, mathematical, reading, health, scientific literacy etc. Mathematical literacy can also be found under the term numeracy between the components of functional literacy. The definition of mathematical literacy, according to J. Průcha, E. Walterová and J. Mareš (2009, p. 147), is based on OECD PISA sources and it is formulated as “the ability of an individual to identify and understand the role of mathematics in the world, to make well-founded mathematical judgments and deal with mathematics in a way that will meet the needs of the present and future life of the individual”. According to an older definition it is “the ability to recognise and understand mathematical problems, deal with them and use mathematics in private life, in the employment and in the company of friends and relatives as a constructively involved and thoughtful citizen” (Straková, 2002, p. 11). The most frequently used definition is a formulation laid down for the OECD PISA international research: “Mathematical literacy is an ability of an individual to recognise and understand the role of mathematics in the world, to make well-founded judgements and to penetrate into mathematics so that it helps meet living needs of the individual as a creative, interested and thoughtful citizen.” (Learning for Live – OECD PISA 2003 Research Results). The essence of mathematical literacy is, therefore, to understand the surrounding world and to be able to solve various social issues through mathematics.

2 School climate and class climate in terms of education

The term climate comes from Greek and means “prevailing weather conditions”. The term climate is not used only in this context. We use this term also to describe the particular environment, “prevailing conditions” of the environment. In pedagogy, the terms class climate, school climate and school environment climate are often used (Petlák, 2006, p. 15). The notions of school and class climate are very closely related to the terms of school and class environment and atmosphere. The learning environment is beyond the social-psychological aspect and refers to the physical environment as well (class lighting, class equipment, wall colours and other), whilst the class atmosphere is current, it is a short-term condition in the class, often changing, sometimes even during a teaching unit (Gavora, 1999, p. 239).

There are various factors affecting school or the class climate (teachers, students, parents, environment and others) but also interactions between teachers and students or between the students themselves. Just because school or class climates are affected by several factors, we cannot talk about universal climate. The group of students in a class can, however, act differently with different teachers. The experience shows that whilst one teacher experiences a rather negative class climate, another teacher perceives it as non-problematic. It means that a variety of factors participate in the class climate (Petlák, 2006, p. 18).

Class climate is, in fact, a summary of subjective evaluations and self-evaluations of the perception, experiencing, emotions and mutual interactions of all participants, which evocate in them, as co-creators and consumers, educational and other activities in a given environment (Čapek, 2010, p. 13). A positive perception of school is in the interest of each educational organisation. By modernisation of material resources, by application of innovative teaching methods and forms into the educational process, schools have an impact on the after-school environment and other determinants, which in mutual relation contribute to modelling the school life. School life and school spirit are the terms characterising a school as a whole in the positive or negative sense. A positive or negative perception of school is based on feelings we get at the entrance to each school. One of the reasons of the mentioned feelings is the fact, that after entering a school, school climate affects us immediately. Each school has its own specific climate that affects the educational process taking place in the school, social relationships in the school, motivation, the results achieved in each area of school work. If we visited several schools, we would have got the impression, that despite relative similarity they are not the same. The difference is just in the school climate. School climate is a state present in the educational practice. By its nature, it creates a school's image not only for the society but also for the participants of school life (Petlák, 2011, p. 99). School represented by a certain hierarchy of relationships in which they equally apply specific rules, principles, norms and conditions for their functioning and existence in every-day life. If these conditions are respected and complied with by all the actors of school life, then the system works well. Its actors are happy, feel safe and can develop and use their skills. The principles closely related to a school are respect for the positions and status of individual people, filling the roles that are necessary for the existence of a school's system. The actors of school life, which are students, teachers and other employees, represent the consumers within the school context. School climate is also affected by the administrative workers', school caretaker's, maintenance man's, and cooks' willingness or unwillingness. Parents, administrative staff and local authority employees also intervene in the school climate, whether directly or indirectly (Petlák, 2011, p. 109). The school should seek the satisfaction of all participants of school life. It cannot only support teachers and suppress the opinions of pupils and students, nor can it be under the pressure from parents and focus only on a small group of students. The director should not restrict the creativity of teachers and consider the school to be his/her private company. Also teachers should not feel threatened by their students on one hand, but on the other hand they are obliged to follow the rules and the school's internal procedures (Čapek, 2010, p. 215).

3 Conclusion

With respect to the positive effects of climate in the school environment, mathematics comes into the centre of attention of education. The interest of students in studying mathematics arise their interest in technical subjects. The level of mathematical knowledge will be strengthened, which will be transferred not only into the higher level of education but also into practice.

The paper was written as a part of the research task KEGA 036UKF-4/2014 “Influencing Aggressive Behaviour of Students by Means of Creating a Positive School and Class climate.”

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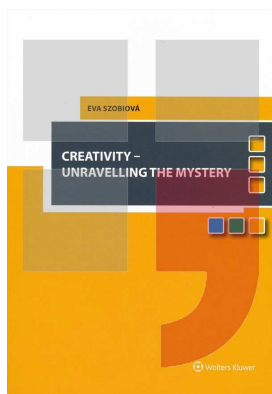
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REVIEWS

Creativity – Unravelling the Mystery (Eva Szobiová)

Prague, CZ: Wolters Kluwer, 2014. ISBN 978-80-7478-564-1.

Katarína Greškovičová*



In our world being creative is a common label whether for everyday people or artistic people, scientists, even for companies. Posters entice you to become more creative thanks to various courses or workshops where you prepare your own cosmetics, meals, jewelry and so on. People are in an intense search for creative solutions to ever-changing world and unpredictable problems. Those are different types of creative products. Yet, creativity is much more and goes beyond the visible. Though thousands of publications appear every year now, it still remains complex and perplexing. Even though we cannot crack the mystery, if you still want to lift a corner of the veil covering the broad concept of creativity, we can recommend a book that covers every connotation you can think of when hear the word “creative, gifted, ingenious, innovative, inventive, visionary or original.”

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The author is the well-known Associate Professor, Eva Szobiová, PhD., who has dedicated her whole professional life to different aspects of creativity. Known for her abundant publications (2 monographs and more than 120 studies), plus her numerous participations in research tasks and scientific grants, we can take for granted that the publication on creativity will set high standards. Three book reviewers also give more credit to the book, among them Professor Miron Zelina, DrSc., a leader in humanistic education as well as the author of several successful books on creativity.

262 pages of the text itself and the exhausting number of references (460) give a clear idea that the book is not short or for uninterested readers. Clearly, it is rather intense, broad and digs deeper. The aim of the first edition of the book *Creativity – Unravelling the Mystery* is to reveal a fragment of creativity and to explain the gradual progress in the understanding and recognition of creativity from a psychological point of view. Over the last sixty-five years, comprehensive research has been conducted and a lot of new ideas have emerged since famous Guilford's speech in 1950. The book represents a theoretical glance at the issue and brings basic and vital information together with new research findings and concepts in this broad area as well as author's own ideas and research results. The book also informs us about controversial ideas, such as illness or giftedness connected with creativity. However, it includes neither descriptions of various assessment methods nor the developmental steps required to be more creative. So we can classify the book as being mostly focused on the theory that stands behind the term creativity.

When browsing through the book you will be captured by nine chapters and their sub-chapters which try to cover all aspects of creativity, beginning with the first chapter- Concept of creativity in the past and today, continuing with Major aspects and factors of creativity, "4 + 2P". The third chapter deals with the Cognitive fundamentals of creativity. The following two chapters focus on Motivational sources of creativity and Emotions as the source of creativity. Development of creativity describes the creative manifestation in different life phases. Mention must also be made of exceptional people in the chapter Creativity as part of giftedness. The last chapter deals with Psychological approaches to creativity.

As we can see the author tries to answer basic questions about creativity, its concepts and definitions. The overview and synthesis of definitions clarify this area very well. However, she also tries to explain interchanging concepts like creativity and intelligence or invention and inspiration. Other chapters attempt to describe the origins of creativity and structure with a focus on the rationale needed as a basic core for creativity as well as the substantial prerequisites that play a partial role in it. Its development as well as outer and inner conditions are defined, the basic lines of psychological approaches are outlined.

The author balances older and newer conceptions within the creativity field. She mentions classical works and ideas such as the four Ps described by Rhodes, the four stages of the creative process by Wallas, approaches to creativity by Guilford, Torrance, Amabile, Urban, Maslow, Freud, and Rogers, Big and little C, features of products as stated by Bessemer and Treffinger, conditions of the creative place in macrosocial and microsocal level, cognitive requirements in creativity, model of conflict or fulfillment, positive and negative emotions in creativity etc. On the other hand, she adds new information that has appeared relatively recently- different 2 Ps by Simonton and Runco, the dark side of creativity, ethical and moral aspects of creativity, new research focused on young adults, youth and children, new developmental, economic, typological or evolutionary theories, longitudinal research mapping creativity through the human lifespan, mini-c and Pro-C by Kaufman and Beghetto, creative process research in computers, functional models of the creative personality presented by Fiest, flow by Csikszentmihalyi, models of motivation synergy, and so on.

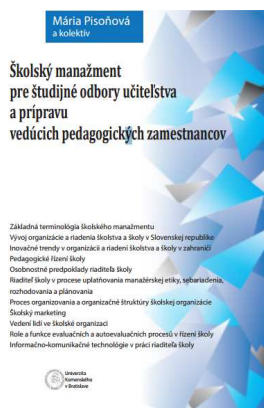
In Slovakia, the book represents an excellent and exceptional work that can be compared with foreign books on creativity. The author approaches the topic in a very responsible and scientific manner. She clearly presents her ideas on creativity plus her own research conclusions. Moreover, she also describes every notion of creativity, but underlines the ecological model of creativity, innate to everybody. In her opinion everybody can be creative, but at different levels. Her standpoint is an optimistic and humanistic one. In addition, we particularly appreciate that works by Slovak and Czech researchers or theorists, for instance by Hlavsa, Dočkal, Ďurič, Ďuriček, Ďuričeková, Jurčová, Kováč, Kováčová, Kusá, Lokšová, Lokša, Zelina and many others, are also cited among publications of foreign authors.

Eva Szobiová deals with a very current issue. Her book is full of serious and valuable information and fulfills the promises the author states in the preface. It will surely contribute to the present psychology disciplines, since the author synthesizes and analyses the various aspects of creativity in a very comprehensive manner and therefore its usage cannot be disputed. It may serve as a textbook, an additional study book to find deeper knowledge, a review of traditional and contemporary approaches, or clarification of what we mean when talking about creativity. The terminology is of course a psychological one and the text demanding and challenging, but the terms are understandable, since every concept is clearly explained. Thus, this book, with its integrated data, will be useful not only to pedagogical specialists, or students at secondary schools or universities, but also to other experts dealing with education or upbringing or even parents and other creativity-lovers.

**Školský manažment
pre študijné odbory učiteľstva
a prípravu vedúcich pedagogických zamestnancov
[School management of the courses for teachers and
preparation of leader teaching staff]
(Mária PISOŇOVÁ et al.)**

*Bratislava: Univerzita Komenského v Bratislave, 2014. 228 pp.
ISBN 978-80-223-3621-5.*

Miriam Bitterová*



The publication “School management of the courses for teachers and preparation of leader teaching staff” is designed primarily for university students and pedagogues. It can be used in the context of lifelong learning of teaching staff. The leader staff, managers on various levels and professionally oriented public which deals with school management will appreciate the quality of the book. The most important and basic task which authors deal with in the given publication is to create university textbook which reflects the requirements of the study’s field 1.1.1 The teaching academic subjects with a specific definition of the future teachers’ and potential leader teaching staff’s knowledge. The main topic is the issue of school management which takes into account the

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interconnection requirements resulting from the description of the above study program with the requirements of practice. While processing solving issue the authors are focused on current requirements of school management and leader teaching employee. At the beginning the authors point out that the character of leading school organisation has changed dramatically. Today school has to respect the requirement of the state and the students within ensuring the basic functions. High quality of education and excellent results are accomplished if educational, economical, marketing, personal and juristic sub-systems are working correctly. Does current headmaster have a good knowledge, skills and abilities that he can face the stress on the professional level? This textbook makes clear this issue and deals with it by creating a complex and innovative content of university course "The school management" which makes the preparation of teachers and students easier. Its use is also evident in the context of continuous education, especially in the function education and other types of leader teaching staff education.

The first chapter "Basic terminology of school management" is the entrance of solving issue. Within each sub-chapter the attention is paid to basic management concepts, process, school management, structure management mechanisms of educational institutions and the overall education system in Slovakia. Specific subsections are devoted to basic functions of schools and education directors and other leader teaching staff.

The next chapter "The development of the organization and school management and schools in Slovak Republic" says about the organization and school management. It means the school management since the year 1989 till the present where the opinion development on the organization and school management in the science systems are explained. While the second chapter deals with the domestic situation, the third chapter is devoted to educational policy and management schools abroad, reflecting the title of "Innovative trends in organization and education management and schools abroad."

The fourth chapter deals with basic and essential part of school management "Educational school management." This chapter contains primary aspects of the school management and the teaching process determinants which influence the school life and the management of this process.

Chapter five "Personality requirements of the headmaster" and the sixth chapter "Headmaster in the process of management ethics, self-managing, deciding and planning" draw their attention on requirements, properties, abilities, personality and leader teaching competencies and also on norms, methods and management techniques and self-managing, delegation of responsibility, etc. In the section 6.4.1 there is explained in details how to create an algorithm of school strategic programme (SWOT analysis, targets determination, resources, tactics ...).

The next three chapters follow each other. We focused chapter seven named "The process of organizing and organizational structure of the school organization" and the eighth chapter "School Marketing" on three important

factors: satisfying the costumer's needs and desires (students and their legal representatives) and the public interests (national requirements). The ninth chapter "Leadership in the school organization" deals with personal management, leadership styles, motivation, managerial communication and ways of resolving conflicts and it finishes whole topic of school management.

The tenth chapter named "The role and processes functions of evaluation and self-evaluation in the school management" is placed suitable. It explains the meaning and importance of evaluation and self-evaluation processes in Slovakia and abroad, its character and steps of process are described in the third section. With the author we can conclude that the management quality it strategically necessary and helps to achieve better competitiveness.

The last eleventh chapter "Information and communication technologies in the headmaster's work" is not less important. Nowadays the information literacy and information competences are necessary unconditionally to each control activity. This chapter presents selected school information systems, licenses and application for educational institutions and explains the methods of implementation in schools.

Overall, I evaluate this publication in terms of content as an appropriate tool which contributes to satisfying the needs and the current school management requirements. In formal terms, the textbook accomplishes all the criteria put for this type of publication. In technical terms, the clarity is strengthened by many pictures and graphs. The book is suitable divided in 11 chapters which are following to each other logically. The epilogue summarizes all authors' professional characteristics. The quality of the authors is evidenced by the abundant publications and research works.

The effective international cooperation helped to create the quality publication which deals with key fields of school management.

INFORMATION

RNDr. Karol Korintuš, PhD.

*Erich Petlák**



In September, more precisely on September 14, 2015, 60 years passed since our colleague and precious friend RNDr. Karol Korintuš, PhD. had been born in Rožňava. 60th birth anniversaries are associated not only with celebration, but also with a certain kind of taking stock of the past years. First of all, I find it necessary to mention that in the occasion of our colleague's anniversary there is a lot to point out and evaluate. Of course, I do not mean any critical evaluation, but a reflection on the work of our colleague, his initiative, diligence, creativity, zeal for work, but also willingness to cooperate and a whole range of other good qualities which are characteristic for him. For these, but also for other good qualities we perceive RNDr. Karol Korintuš, PhD. as an outstanding personality, who has been participating in the activities, development and a permanent increase of the quality of our Institute for several years.

Let's go back to our colleague's brief life chronology. After the years of his childhood, the young Karol, eager for knowledge, went to study measurement and automation technology to the Secondary Industrial School in Košice. He did

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not find the knowledge from secondary school sufficient and decided to continue his studies at the Faculty of Natural Sciences of the Comenius University in Bratislava. At that university, he studied teaching Mathematics and Physics. Later, he succeeded in rigorous exams and earned the degree of RNDr. His deep interest in education and things related to it lead him to the decision to raise his qualifications and so, in years 2009 –2014 studied in the PhD. program at the Faculty of Management of Prešov University in Prešov. He finished his studies by defending his dissertation thesis entitled “An Analysis of the Influence of the Public Administration and Local Government Reform on Financing and Financial Management of Regional Schools.”

The above mentioned represents a more or less taxonomic view on his professional growth. I find it necessary to pay attention to his professional career as well. After finishing teacher training, Karol Korintuš became a teacher at the Secondary Grammar School in Dubnica nad Váhom. The proof of his interest in work, but also of a kind of progressiveness in education lies in the fact that after 12 years of teaching he became the director of the mentioned school. At this position, he applied his pedagogical-didactic knowledge, at the same time, he acquired new experience from the field of management. His curriculum vitae suggests that in addition to educational work he is interested in “public affairs” as well and so, after 11 years at the position of the director of a secondary school, he left to work at the Ministry of Education, Children and Youth of the Slovak Republic as the Director General for the division of further education and concepts of financing regional schools. Thanks to his devotedness and creative approach to work he has worked at several important positions. Let us mention at least two of them: the Head of the Service Office of the Ministry of Culture of the Slovak Republic and the Deputy Director of the State Pedagogical Institute in Bratislava.

We will pay special attention to his work at the Dubnica Institute of Technology in Dubnica nad Váhom. He has worked here since 2008. His creative approach to work, knowledge and experience in the managing sphere of education contributed to the fact that, immediately after his arrival, he became the Vice Rector of the school and he also worked at the position of the Rector of the Dubnica Institute of Technology. At present, he is the Vice-Rector for Education and Marketing.

Needless to say, when taking a look on the activities above, we do not mean only job positions but specifically his work. It is really fruitful as it is associated with working on important school projects and documents, e.g. Konštantín and Milénium – projects of the Ministry of Education – but also a project focused on financing regional schools, etc. Obviously, the main aim and the main interest of Karol Korintuš has been increasing the quality of education. It is necessary to add that it is not only the past, as Karol is still active and creative at present, and is making use of the experience he has gained in the field of education, but also in the managing sphere. In the field of education, it is, above all, at the position

of the Vice-Rector, but also of a member of the Board of Universities and Colleges and of several commissions.

For us, his work as the Vice-Rector is extremely valuable. I do not hesitate to say that he belongs to the most important personalities of our Institute, because he utilizes his professional experience into everyday work. I mention that because there is probably not a field in which he could not give advice or express his opinion, professional or legal but especially human. One of his characteristic features is that he does not make hasty decisions, but he always applies the “look before you leap” approach – considers, compares, searches for the optimal solution and only then makes a decision. Also for these qualities, for his human approach he is very popular among his colleagues.

The above stated is, more or less, a description of his professional activities. It would not be correct not to mention his other activities. Dr. Korintuš is well known for his deep interest in “public affairs”, too. We can highlight his work in the City Council in which he is the Chairman of the School Commission for the fourth election period. He was a very active member of the Society of the Third Sector of the Slovak Republic in the professional division of education and science, a member of the national professional evaluation committee of Secondary Professional Activity and he is the member of the Scientific Board of the Dubnica Institute of Technology, etc.

If someone has the impression that our colleague has lived a very active life, then I must add that it is only a brief list of his activities. I could mention a whole range of other activities but I point out instead that besides all the above mentioned, for Dr. Korintuš the educational process and students have always been on the first place. He is one of the pedagogues who support students and is interested in their expertise and development.

Among his scientific research work, we must mention his orientation on the solution of the problems of higher education but also on the issues of regional school. In the given field, he has published several studies and documents that has had an impact on the real school policy, e.g. introducing vouchers for financing after school activities, e.g. educational vouchers, and introducing vouchers to bring cultural values closer to the youth.

Among several honours he has received for his work, I would like to mention the prestigious Medal of St. Gorazd in 2014.

RNDr. Karol Korintuš, PhD., besides demanding managing and organisational work, of course, has always found time for his family and his daughter who has successfully completed her university studies in the field of law.

What else to mention? Maybe only to briefly but sincerely thank him for all the work he has done and to wish him prosperity, many creative ideas and lots and lots of pleasant days in the circle of his dearest ones and in the circle of his colleagues. One more time, warm congratulations.

Slovak Welding Society's Commemorative Medal for Acta Technologica Dubnicae

On November 18, 2015, in the occasion of the 60th anniversary of the foundation of the Slovak Welding Society, Acta Technologica Dubnicae was awarded its Commemorative Medal for the journal's contribution to the development of technical education.



Publication Ethics and Malpractice Statement

The Dubnica Institute of Technology in Dubnica nad Váhom, Slovakia, as publisher of the journal *Acta Technologica Dubnicae* takes its duties of guardianship over all stages of publishing extremely seriously and we recognize our ethical and other responsibilities. We are committed to ensuring that advertising, reprint or other commercial revenue has no impact or influence on editorial decisions. In addition, the Editorial Board will assist in communications with other journals and/or publishers where this is useful and necessary.

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An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Submitting the same manuscript to more than one journal concurrently constitutes unethical publishing behavior and is unacceptable. In general, an author should not submit for consideration in another journal a previously published paper. The authors and editors of the journals concerned must agree to the secondary publication, which must reflect the same data and interpretation of the primary document. The primary reference must be cited in the secondary publication.

Acknowledgement of sources

Proper acknowledgment of the work of others must always be given. Authors should cite publications that have been influential in determining the nature of the reported work. Information obtained privately, as in conversation, correspondence, or discussion with third parties, must not be used or reported without explicit, written permission from the source. Information obtained in the course of confidential services, such as refereeing manuscripts or grant applications, must not be used without the explicit written permission of the author of the work involved in these services.

Authorship of the paper

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

Disclosure and conflicts of interest

All authors should disclose in their manuscript any financial or other substantive conflict of interest that might be construed to influence the results or interpretation of their manuscript. All sources of financial support for the project should be disclosed. Examples of potential conflicts of interest which should be disclosed include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Potential conflicts of interest should be disclosed at the earliest stage possible.

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Duties of the Editorial Board

Publication decisions

The editor of a peer-reviewed journal *Acta Technologica Dubnicae* is responsible for deciding which of the articles submitted to the journal should be published. The validation of the work in question and its importance to researchers and readers must always drive such decisions. The editor may be guided by the policies of the journal's editorial board and constrained by such legal requirements as shall then be in force regarding libel, copyright infringement and plagiarism. The editor may confer with other editors or reviewers in making this decision.

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An editor should take reasonably responsive measures when ethical complaints have been presented concerning a submitted manuscript or published paper, in conjunction with the publisher (or society). Such measures will generally include contacting the author of the manuscript or paper and giving due consideration of the respective complaint or claims made, but may also include further communications to the relevant institutions and research bodies, and if the complaint is upheld, the publication of a correction, retraction, expression of concern, or other note, as may be relevant. Every reported act of unethical publishing behavior must be looked into, even if it is discovered years after publication.

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Peer review assists the editor in making editorial decisions and through the editorial communications with the author may also assist the author in improving the paper.

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