

# Professional Competence of Teachers Concerning the Content of the Educational Area: Man and the World of Work in Pre- primary and Primary Education

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## Abstract

In the introduction of the paper, the issue of the quality of technical education from the point of view of the professional competence of teachers, with a focus on undergraduate preparation of future teachers and their successful performance in their future careers, is discussed. Further, in more detail, the authors analyse study programs, including the teaching subjects incorporated into them, of pre-primary and primary education at three universities in Slovakia concerning the content and goals of the educational area Man and the world of work. Results of their comparative analysis have shown significant differences in the teacher trainee preparation at the concerned universities. As to the bachelor study programs, these correspond with the topics of the educational area. In the master study programmes, the topical units of the educational area are indicated indirectly in the frame of the learning outcomes. At the same time, the emphasis is put mainly on didactical aspects.

**Keywords:** Technical education, Practical preparation, Undergraduate training, Pre-primary education, Primary education

## 1 Introduction

Teacher quality support is crucial in improving education (Harris & Sass, 2011) and represents an essential social science phenomenon in many countries, including Slovakia. In connection

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with this, there are increasing demands for improving the quality of teaching at all levels of study, thus also in universities (Yusuf, 2005). Currently, there are 35 universities in Slovakia. Of the total number of universities, six technical universities provide technical education (Slovak University of Technology in Bratislava, Technical University in Košice, University of Žilina in Žilina, Trenčín University of Alexander Dubček in Trenčín, Slovak University of Agriculture in Nitra and Technical University in Zvolen). The schools mentioned above offer many specialised programmes and fields of study, which make them highly recognised institutions providing vocational training for various areas of life.

However, including technical education in preparing students to become future teachers (Subrahmanyam, 2020), emphasising the didactic regularities of technically oriented subjects, is particularly significant. The undergraduate preparation for the profession of a teacher of occupational education for kindergarten and occupational education for primary school is vital. The preparation consists of acquiring theoretical expertise in pedagogy, psychology and the sciences of technical teaching subjects. The goals and objectives of this education should reflect the emphasis that is placed on the development of competences necessary for their future profession while applying such strategies that will achieve the fulfilment of the current requirements of society in the field of technical education in schools (Bahodirovich & Romilovich, 2021). Such training is carried out at three universities in Slovakia: The University of Constantine the Philosopher in Nitra, the University of Prešov in Prešov and the Matej Bel University in Banská Bystrica.

These schools include technical education in the university training of future teachers for pre-primary and primary education in Teaching and Educational Sciences in the study programmes of Pre-school and Elementary Education (bachelor's degree) and Teaching for Primary Education (Master's degree).

Educational institutions must continuously adapt their courses and seminars to achieve the practical sustainability of their programmes in rapidly changing job demands (Oraison et al., 2019). Quality university education should prepare students for their future profession. The focus should be on developing competencies that will achieve the current social demands and educational standards in technical education.

## **2 State Educational Standard and the Educational Area Man and the World of Work**

On 6th July 2016, with effect from 1st September 2016, the State Educational Program for Pre-primary Education in Kindergartens (from now on, referred to as SEPO) was established. The main goal of education and training that results from this document is the achievement of optimal cognitive, sensorimotor, and socio-cognitive levels as a basis for school education in primary school and for life in society (SEPO, 2016). The content of this program is structured into learning domains in a similar way to primary schools:

- Language and communication.
- Mathematics and working with information.
- Man and nature.
- Man and society.
- Man and the world of work.
- Art and culture.
- Health and movement.

The work component is implemented through the educational area Man and the world of work, which is further subdivided into these areas:

- Materials and their properties,
- Constructing,
- User skills,
- Production technologies,
- Crafts and professions.

The main goal of Man and the World of Work is to shape and develop the child's basic skills, mastering the tasks of daily living and skills in using the tools needed in everyday life. The emphasis is on developing those skills that are developmentally important for the child, for example, to better manage graphomotor predispositions, self-care activities, and everyday household tasks (SEPO, 2016). The updated State Educational Program focuses on developing elementary technical thinking, including activities for experimentation and solving simple problems in which children can explore the properties of materials by trial and error, look for different solutions, and create original new procedures and solutions.

Since 1 September 2015, an innovative State Educational Program (from now on referred to as ISEP1) for primary schools has been in force. Technical education is carried out in work-based education in the 3rd and 4th grades and the lower secondary level in technology. Both subjects have undergone significant restructuring due to the subject commission at the State Pedagogical Office for the field of Man and the world of work (Kožušková & Stebila, 2014). The content of the subject of work-based education focuses on developing key competences and skills applicable in various spheres of human life. Changes have also occurred in the standard, where students' performances are more clearly defined (thus better measurable) at different levels according to B. S. Bloom's taxonomy. In addition, the updated educational standard allows pupils to do activities such as searching, investigating, exploring, discovering, manipulating objects, experimenting, and constructing, as these are the essential prerequisites for developing their practical skills. The content focus of the subject is now more oriented towards more complex activities and technologies, as well as individual work and teamwork, which are the most desirable competences from a society-wide perspective (Brečka & Valentová, 2018).

The educational standard consists of the subject's characteristics and the basic learning objectives specified in the performance standard. The educational content of the subject of

work-based education contributes to the formation of life and career orientation of pupils. The curriculum is divided into five sub-areas (Table 1).

Table 1: Overview of the subject units of Work-based education (ISEP1, 2015).

Educational area Man and the world of work	
3rd grade	4th grade
Man, and work	Man, and work
Creative use of technical materials	Technical materials
Fundamentals of construction	Fundamentals of construction
Catering and preparation of dishes	Preparation of dishes
Folk traditions and crafts	Folk traditions and crafts

The educational field encompasses various work activities and technologies based on creative teamwork. Through technical education, pupils are guided to acquire basic user skills in various fields of human activity. Throughout the whole process of teaching technology at the primary level of education, the goal is crucial: forming a technically, intellectually and emotionally creative person who will orient himself/herself in the information society.

ISEP1 for the educational area Man and the world of work is based on the requirements of practice, focusing on primary school graduates' knowledge and practical skills to consider pupils' attitudes and career orientation. The requirements are placed more on new forms of teaching, such as investigation and experimentation. They aim to make pupils active and acquire knowledge through practical activity and trial and error. Hence, there are increasing demands on teachers, on their pedagogical and mainly practical training, on their professional competences (Naydenova & Naydenova, 2016) because the teacher is the one who plays a vital role in the successful implementation of the curriculum (Prasetyono et al., 2021).

## 2.1 Methods and Results of the Analysis

Practical training occurs in university education through technical subjects, resulting in a professionally qualified technology teacher. We aimed to compare the subjects in the preschool and elementary pedagogy study programs (PEP) and Teaching for primary education (UPV) at all three universities in Slovakia with the content and objectives of the educational field of Man and the world of work. The analysis aims to obtain the basis for preschool and elementary pedagogy study programs (PEP):

- assessment of the professional competence of teachers of technical subjects,
- specifying the gaps in students' professional preparation to find out what they need to improve concerning the teaching of technical subjects,
- improving the quality of undergraduate student training so that the educational programs of all universities are meaningful and connected to practice,
- making universities competitive and securing their prospects.

We used a case study because several aspects of the teaching subjects were examined (analysed) about the educational area of Man and the world of work. A case study provides an in-depth exploration and multifaceted understanding of an issue in a real-world context (Crowe et al., 2011). The analysis of the subjects occurred in two stages.

- A. Comparison of subjects in the pre-school and elementary pedagogy study program (PEP) with the educational area Man and the world of work,
- B. Comparison of the subjects in teaching for primary education programs (UPV) with the educational area Man and the world of work.

In both cases, the technical subjects in the programs, their content focus (curriculum) and learning outcomes (performance standards) were examined. Subsequently, we compared them with the educational area's objectives and content focus (sub-areas). We included only compulsory subjects of a technical nature at all three universities in the analysis (Table 2).

## 2.2 Comparison of Subjects in PEP Programs with the Educational Area Man and the World of Work.

An overview of the results of the analyses processed during the first stage of the comparative study (see the above-stated stage A) is summarised in Table 1.

Table 2: Comparison of subjects in PEP programs with the educational area Man and the world of work – SEPO.

Man and the world of work		UKF Nitra	UMB Banská Bystrica	PU Prešov
		Working techniques in pre-primary education	Science and technology education	Work-technical education
Themes arising from the SEPO	Objectives of the educational area	✓	✓	✓
	Developing skills in working with tools	x	x	x
	Household activities	x	x	x
	Development of elementary technical thinking	x	x	✓
	Development of creativity	x	x	x
	Investigating the properties of materials and objects (trial, error, experiment)	✓	✓	x
Sub-areas	Materials and their properties	✓	✓	✓
	Constructing	x	✓	✓
	User skills	✓	x	✓
	Production technologies	✓	✓	x
	Crafts and professions	x	x	✓

From a comparison of the content of the courses in the PEP and SEPO study programs, we can express the following findings:

- It is interesting to note that no university has a complete alignment of its programs with the standards of the educational field.
- There are no differences across schools regarding meeting course objectives, which undoubtedly indicates that all universities have the same intent in preparing students to meet educational objectives.
- Themes focusing on applying methods of investigation, research and experimentation are evident in the study programs of UKF and BB.
- PU forms an exception in developing elementary technical thinking in line with SEPO.
- Other target requirements in the contents of compulsory courses at individual universities were not indicated compared to the SEPO targets.
- Within the sub-areas resulting from SEPO, the topic „Materials and their properties“ is consistently included in the compulsory subjects at all universities. According to the information lists, the construction area is absent in the teaching at UKF in Nitra, User Skills at UMB in BB and Production Technology at PU. The area of crafts is absent at UKF in Nitra as well as at UMB in Banska Bystrica.
- The analysis also recorded topics beyond the requirements of SEPO: in Nitra, it is the issue of safety and hygiene at work with technical materials; in BB, the topic of strategies and methods of science/technical education; and in PU, the topic of work-technical interest activities in school educational institutions.

The comparison shows that students acquire basic knowledge about the content of the educational area, the individual sub-areas, and the content and performance standards necessary for teaching. However, less attention is paid to developing strategies for supporting creativity, skills, and technical thinking resulting from the educational area of Man and the world of work.

However, we can assume that the missing components of SEPO are included in the compulsory elective courses of the individual universities.

UKF – Working skills with materials, Methodology of work-based education; BB – Working with technical materials; PU – Natural, geographical, and technical interest activities; Transport education.

## **2.3 Comparison of Subjects in the Study Program Teaching for Primary Education**

An overview of the results of the analyses concerning the area of Man and the world of work for primary education processed during the second stage of the comparative study (see the above-stated stage B) is summarised in Table 2.

Table 3: Comparison of subjects in the study program Teaching for primary education (UPV) and the educational area Man and the world of work for primary education (ISEP1).

Content standard	Compulsory subjects		
	UKF Nitra Work-based education with didactics	UMB Banská Bystrica Didactics of science and technology education	PU Prešov Didactics of work-based education
Thematic units, according to ISEP1	x	x	x
Basic curriculum documents	✓	✓	✓
Objectives of technical education	✓	x	✓
The teacher and his/her competences	✓	x	✓
Planning and preparing for lessons	✓	✓	✓
Assessment and classification	✓	✓	✓
Material security of the teaching process	x	x	✓
Safety and hygiene attributes of work activities	✓	x	x

From the comparison of the contents of the didactics and ISEP1 (Table 3), we can observe that the thematic units resulting from the educational area Man and the world of work are not directly indicated in the information lists of the individual universities. We can deduce a certain degree of their fulfilment from the defined conditions for the completion of the subjects and the learning outcomes to be achieved by the students at the individual schools (creation of didactic materials and aids for the technical area, demonstration of knowledge of the curriculum, orientation in the educational area, creation of preparations for the topics from the textbook of work-based education and SEP, and others).

Within the master's degree of university training of students, technical education is implemented in subjects with an emphasis on didactics, which is in line with the profile of the graduate. Hence, the structure of topics in the courses and information lists. Didactic topics are included almost identically in the contents at all three universities. The exceptions are the topics of material support for teaching and safety issues in work-based education.

### 3 Summary of Results and Analysis

Based on comparing the curricula of different universities, it may seem that some subjects are too specific, others relatively less so. Schools have developed their own specificities in delivering technical education, but about two-thirds of the topics in the bachelor's degree are common. In the master's programs, the subject areas are mentioned indirectly in the learning outcomes, with a particular emphasis on didactic aspects. Based on the results, we can only conclude that, at present, the contents of the compulsory subjects at all universities are satisfactory and well-set and exemplify good undergraduate preparation of students for

teaching technical subjects at the pre-primary level. To a greater extent, they are in line with the standards of the educational area Man and the world of work for pre-primary education, and therefore, the students have the prerequisite to acquire the professional competence to exercise the teaching profession in the given field. They will acquire knowledge about materials, their processing technologies, and the choice of these materials for a given level of education. Last but not least, they will be able to apply the acquired knowledge to the design and creation of situational tasks of pupils' learning for the educational area Man and the world of work with complex didactic analysis and self-reflection.

Despite some differences in the PEP and UPV programs at the different universities, we can argue that they meet the contents of the educational area and the national curriculum. The courses have a good structure. However, the problem we perceive is that the areas lacking in the compulsory courses are further elaborated in the optional courses, but every student may not choose these. This situation implies that not all graduates have the necessary competences for quality teaching of technical subjects and, therefore, complete competence for the given educational field. We know from experience and practice that students who do not also take compulsory elective subjects have difficulties in orientation in all materials. They have no room for developing their fine motor skills and imagination, which are reflected in their final practical outputs or theses.

## 4 Conclusion

The paper partly suggests research possibilities in the practical preparation of teachers of technical subjects. It points out some differences in the framework of students' preparation and the contents of the educational area Man and the world of work. However, we perceive the lack of integration of innovative educational strategies such as STEM and STEAM in all curricula as a problem. The European Union (2016) „encourages Member States to better prepare young people for changing labour markets, to develop their competences in science, technology, engineering and mathematics and skills of the 21st century“(Dede, 2007). STEM skills and highly qualified teachers in the field are seen as crucial elements by which it is possible to achieve these goals. Some bachelor's study program topics can be included in the field (Materials and their properties, investigating the properties of materials – trial and error, experiment and construction). However, they are too general; therefore, it is unclear whether universities address the issue of integrating STEM. For this reason, it is crucial to make this education part of students' undergraduate training and to enable them to acquire knowledge of this teaching methodology and develop the relevant competences. To obtain comprehensive results and the aim of further investigation, we will conduct further analysis to verify what teachers lack or have lacked in their undergraduate preparation. Subsequently, we will specify and develop a way to re-educate them.



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