The Curriculum of Technical Subjects in Primary Schools in Slovakia and Abroad

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DOI: https://doi.org/10.53349/re-source.2025.is1.a1390

Abstract

The curriculum plays a strategic and essential role in advancing education in every country. This research aims to compare the curricula of technical subjects in primary schools across three countries: the Czech Republic, Poland, and Slovakia. The study employed content analysis and synthesis methods, with documentation and literature review techniques used to collect research data. In the content analysis of the documents, we focused primarily on the division of primary schools into stages (cycles), the mandatory nature of the national curriculum, common curriculum topics across different education levels, and specific topics in each country. We believe this overview will be valuable for those who use the curricula of technical subjects in primary schools, both within educational institutions and for research purposes.

Keywords: Curriculum, Technical Education, Comparison

1 Introduction

The curriculum plays a strategic role in education and serves as the foundation for all educational activities in schools. It is a key tool for achieving educational goals (Santika, Suarni & Lasmawan, 2022). However, the curriculum is not static or untouchable—numerous changes to global primary school curricula, along with adjustments within individual educational fields or subjects, reflect this dynamic nature. Social changes are typically reflected in curriculum changes across different types of schools. This has been true for the Slovak primary school curriculum, which has undergone numerous changes since the

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country's independence. Currently, Slovak primary education is preparing for substantial curricular changes set to take effect nationwide in 2026. Other countries are also responding to societal changes by modifying their curricula, some of which share a historical background and similar primary education systems with Slovakia.

In recent years, reforms in the content and organization of primary education have taken place in Poland, the Czech Republic, and Slovakia. In each country, these reforms sparked discussions among both the professional and general public. New educational documents have been in effect in Poland since 2017, in the Czech Republic since 2021, and will be implemented across all schools in Slovakia starting in 2026. These countries share a significant part of their educational history up until 1989. After major societal shifts in these countries, each one began to chart its own path for its education systems. Since then, these nations have implemented several reforms, primarily aimed at modernizing their education systems and aligning them more closely with those of other European countries.

2 Research Methodology

In this article, we aim to focus on the content and organizational changes in recent reforms that have significantly impacted technical education as part of general education in primary schools. We will briefly describe the content of technical education in primary schools in each country and conduct a content analysis of documents to identify common and differing elements in the content of technical education. In this analysis, we will examine the following documents: national educational programs, framework curricula, and content standards for the educational area "Human and the World of Work." We will monitor: the division of elementary school into stages (cycles), the binding nature of the national curriculum for schools, common curriculum topics across educational stages, and specific topics in each country.

2.1 Poland

Elementary school in Poland consists of 8 grades, divided into two levels. The primary level includes grades 1-3, and the lower secondary level includes grades 4-8.

In the primary level, grades 1-3, teaching is not divided into separate subjects. Students participate in integrated learning, where they study topics in Polish language, mathematics, and other subjects without distinct boundaries between areas of knowledge. During a single class, students might learn multiplication alongside reading (Konczal, 2023).

The subject of "Technology" is taught at the lower secondary level, specifically in grades 4-6. The primary goal of the "Technology" subject is for students to acquire practical skills in technical activities by completing simple projects that involve working with various materials using appropriate tools and equipment. Through these hands-on activities, students develop essential skills and habits that are crucial for their future professional lives. They learn how to

operate in a real workplace, considering the necessary safety and health requirements. The practical approach in teaching "Technology" aims to make it a subject where students can test and apply knowledge gained in areas such as mathematics, biology, computer science, and physics. In "Technology" classes, students explore their aptitudes, technical and professional interests, and discover their talents and passions in technical fields. The subject serves as an invaluable element in students' career orientation, bridging general and vocational education. It is during these classes that future technicians and engineers may uncover their potential. "Technology" is taught in grades 4-6, with a frequency of one hour per week.

The subject of Technology plays an important educational role, teaching respect for manufactured goods and fostering attitudes of conscious use of technological advancements by adhering to occupational safety and health (OSH) principles, respecting regulations, valuing property, and encouraging teamwork. Technology education prepares young people for the effective, responsible, and safe use of modern technical devices in daily life and helps them navigate an ever-evolving technological landscape (Ministerstwo Edukacji Narodowej, 2017).

The knowledge and skills acquired by students are outlined through general and specific requirements. General requirements define the primary educational goals, while specific requirements encompass the range of knowledge and skills that students are expected to acquire throughout the entire educational stage.

Content of the "Technology" Subject in Grades 4-6:

The educational content is outlined in the curriculum *"Jak to działa?"* ("How It Works?"), which reflects the syllabus from February 14, 2017, and incorporates practical school applications. The curriculum is divided into six areas, allowing technical knowledge and traffic education content to be presented to students in a structured manner. These areas are repeated in each grade. The content of instruction includes:

Work Culture

- School rules in the technology classroom,
- Occupational health and safety rules in the workplace,
- Importance of safety signs (pictograms),
- Care for tools and equipment.

Traffic Education

- The student as a road user in the roles of pedestrian, passenger, and cyclist,
- Traffic signs relevant to pedestrians and cyclists,
- Bicycle maintenance,
- Safety rules.

Materials Engineering

- Construction materials (paper, wood and wood-based materials, metals, plastics, textiles, composite materials, electrical materials),
- Electrical components (resistors, diodes, transistors, capacitors, coils, etc.),
- Properties of construction materials and electronic components,

- Principles of separating and processing waste from various materials and electronic components.

Technical Documentation

- Technical drawings (mechanical, construction, electrical, tailoring),
- Information provided in device manuals, on technical labels, food packaging, clothing tags, electronic components, etc.

Mechatronics

- Principles of cooperation between mechanical, electrical, and electronic components,
- Mechanical, electrical, and electronic tools found in households, including devices and technologies for smart home management,
- Toys, robots, and electro-mechanical models (including programmable ones).

Production Technology

- Types of processing for various materials,
- Schedules for different forms of work organization,
- Measurements using appropriate measuring devices,
- Assembly of individual parts into a whole,
- Various types of connections (detachable and permanent, direct and indirect, static and movable).

In Technology classes, students should develop the ability to plan and execute tasks of varying complexity, helping them form correct habits in technical activities. This also allows them to observe diverse technical elements in their surroundings and gain knowledge about their construction, functionality, and safe use. Schools should provide conditions for students to obtain a cycling license by the age of 10.

The curriculum places a particular emphasis on orienting the educational area toward practical student activities, enabling students to apply their knowledge in practice, plan independently, and perform practical tasks. Starting from grade 4, students work with various materials, learning about their properties, basic technologies, and creating different objects, both static and moving structures. They also become familiar with tools, understanding their construction, proper usage, and the rules for safe operation.

2.2 The Czech Republic

Elementary school consists of 9 grades, divided into two levels: the primary level (grades 1-5) and the lower secondary level (grades 6-9).

At the primary level, the educational content is divided into nine educational areas, one of which is "Human and the World of Work," where technical education is provided in grades 1-5. A total of five instructional hours are allocated for this area across these five grades. The framework curriculum does not specify the exact name of the subject through which this content is delivered. At the primary level, educational content is implemented across all

grades, and all four thematic units are mandatory for schools: Working with Small Materials, Construction Activities, Gardening, and Food Preparation.

During the primary level, students should work with various materials, resources, tools, and equipment to understand their properties and potential uses, gain proficiency in handling them, and learn safe handling practices. They should learn to work according to instructions, use templates, sketches, and diagrams in their work, develop independent working skills, and complete tasks on their own.

At the lower secondary level (Grades 5-9) The educational area "Human and the World of Work" is also included in the curriculum. The Framework Curriculum does not specify the subject name through which this content is to be delivered. A total of three instructional hours are allocated for this educational area, which can be taught in any of the grades 6-9. The educational standards for the "Human and the World of Work" area are recommended materials for elementary schools and include the following content:

- *Working with Technical Materials:* Working with materials, choosing tools, work procedures, technical documentation, occupational safety and health.
- *Design and Construction:* Assembly and disassembly of objects, occupational safety and health.
- *Gardening and Animal Care:* Procedures for growing various plants, using flowers for decoration, using and maintaining tools, small animal care, occupational safety and health.
- *Household Operations and Maintenance:* Payment operations and household accounting, operating household appliances, minor household maintenance, occupational safety and health.
- *Food Preparation:* Kitchen equipment and appliances, preparation of simple dishes, occupational safety and health, basic principles of table setting.
- *Working with Laboratory Equipment:* Procedures, instruments, devices, and tools for specific observations, measurements, and experiments; information sources for experiments, measurement protocols, occupational safety and health.
- *Use of Digital Technologies:* Basic functions of digital technology, connecting digital devices, user skills with mobile technologies, cleaning digital devices, occupational safety and health.
- *World of Work:* Work environments and activities in selected professions, prerequisites for careers, information sources and counselling services for career choices, materials for job interviews (Národní ústav pro vzdělávání, 2013, 2021).

The educational area "Human and the World of Work" is unique in that its thematic units for the lower secondary level are offered as options. The thematic unit "World of Work" is mandatory, while schools select at least one additional unit from the remaining seven, based on their conditions and educational objectives. These seven thematic units (Working with Technical Materials, Design and Construction, Gardening and Animal Care, Household

Operations and Maintenance, Food Preparation, Working with Laboratory Equipment, Use of Digital Technologies), despite their diversity, share common framework educational goals.
At the lower secondary level, the "World of Work" thematic unit is mandatory, and schools must select at least one additional unit to be implemented in full. The "World of Work" unit is compulsory for all students in its entirety, and due to its focus on career choices, it is recommended to be scheduled in the higher grades of the lower secondary level.

2.3 The Slovak Republic

Currently, Slovakia follows the Revised National Educational Program, which defines elementary education as comprising nine grades, divided into two levels: the primary level (grades 1-4) and the lower secondary level (grades 5-9).
At the primary level, technical education is delivered through the subject "Work Education," which is introduced in grades 3 and 4 of the primary level, with one class hour per week. For grades 3 and 4, Work Education covers the following thematic units: Human and Work, Creative Use of Technical Materials, Basics of Construction, Food Preparation and Nutrition, Folk Traditions and Crafts (Národný inštitút vzdelávania a mládeže, 2014).
At the lower secondary level, within the educational area Human and the World of Work, technical education is covered by the subject "Technology." The content of Technology comprises two main thematic areas: Technology and Household Economics. The Technology component includes the following thematic units:

- Human and Technology – the relationship between humans, technology, and nature
- Useful and Gift Items, Technical Creativity (creative activities)
- Graphic Communication in Technology
- Technical Materials and Their Processing Methods – including both non-metal and metal materials, and both manual and machine processing methods
- Electrical Energy, Electrical Circuits, Technical Electronics
- Simple Machines and Mechanisms, Household Machines and Appliances, Electrical Appliances in the Household, Home Installations
- World of Work (Revised NEP, 2015)

The content standard for the thematic area Technology is structured by individual grades (5-9). A closer examination of the topics within each thematic unit reveals that they can be grouped into the following categories: The Relationship between Humans and Technology, Technical Communication, Technical Materials and Processing Methods, Electrical Energy and Circuits, Technical Electronics, Household Machines and Appliances, and World of Work.
The thematic area Household Economics includes the following topics: Household Planning and Management, World of Work, Household Maintenance and Upkeep, Food Preparation and Nutrition, Handicrafts, Family Preparation, Gardening and Animal Husbandry. These

topics are not assigned to specific grades, allowing the teacher to choose and allocate them across any grades (5-9).

At first glance, certain thematic units (such as World of Work and Household Maintenance) are nearly identical to units in the Technology area. This inconsistency in the content standard for the subject Technology is a characteristic feature. In practice, Technology teachers are required to dedicate two-thirds of instructional time to topics from the Technology area, and up to one-third to topics from the Household Economics area.

This Technology curriculum is the closest in content to the Czech standard, including topics focused on household operation and maintenance and food preparation.

Since 2023, a new technical education curriculum has been approved for elementary schools in Slovakia as part of a primary education reform under the Recovery Plan. All schools are expected to implement this new curriculum by 2026. The main innovative feature of this reform is the introduction of three consecutive educational cycles: the first cycle will include grades 1 through 3, the second will cover grades 4 and 5, and the third will encompass grades 6 through 9 (Ministerstvo školstva, vedy, výskum a športu Slovenskej republiky, 2023a).

The content designed for the educational area Human and World of Work comprises three components (see Table 1).

	Technology	Career education	Entrepreneurship and initiative
1. cycle	– recognizing material properties (modelling materials, textiles, wood, metals, plastics) – understanding household, transportation technology – construction	– Characterizing selected professions – Identifying personal interests and values	– Setting goals and generating ideas – Basics of financial and economic literacy
1. cycle	– Exploration of technical materials and their properties – Constructions around us – Examination of traditional and modern technical environments	– Self-reflection and feedback – Career portfolio as a tool for developing the student's potential	– Selecting ideas – Human work and its impacts
2. cycle	– Understanding the history of technology and the basics of graphic communication – Utilizing the properties of technical materials in product creation – Exploring the use of simple machines and mechanisms in the household	– Decision-making and creating an action plan – Work-life balance and mental health (well-being)	– Implementation of the idea and verification of its functionality – Problem-solving – Sources of financing ideas

Table 1: Topics within the educational area Human and World of Work from 2026 (Ministerstvo školstva, vedy, výskum a športu Slovenskej republiky, 2023b)

The curriculum for the educational area is designed for each cycle rather than for a specific grade in elementary school. Similarly, the number of instructional hours is allocated per cycle: 3 instructional hours are designated for the 1st cycle, 2 instructional hours for the 2nd cycle, and 4 instructional hours for the 3rd cycle. The subject in which the content of the educational area is taught carries the same name as the educational area itself — *People and the World of Work* — across all cycles of elementary school (Hašková, Lukáčová, 2022).

3 Discussion and Conclusions

Through content analysis of school documents, we attempted to identify the commonalities and differences in the curricula defined for the educational area *People and the World of Work* at the elementary school level. Our analysis of the content intended for the primary and lower secondary levels was complicated by the fact that, in Slovakia, elementary education will be divided into three cycles starting in 2026. In conducting the analysis, we therefore focused on: the structuring of elementary school into levels (or cycles), the binding nature of the national curriculum for schools, common curriculum themes for each level, and specific themes in each country.

Common Features:

In all examined countries, elementary education is divided into two levels. (However, from 2026, Slovak schools will shift to a division of three educational cycles.) Both Poland and Slovakia aim to include one year of pre-elementary education in compulsory schooling. In these countries, the curriculum mandated by the state is binding for schools, with flexibility only in the scheduling of teaching objectives for the educational area. In contrast, the Czech Republic offers a more flexible curriculum, where only one thematic area is state-mandated, and schools choose at least one additional area based on student interests and school conditions.

When identifying themes common to the People and the World of Work curriculum across all countries, the following topics stand out:

- Technical materials
- Design and construction
- Technical documentation
- Safe use of household appliances
- Health and safety at work

These topics constitute a significant part of the People and the World of Work curriculum in all the countries analysed.

Specifics of Each Country:

In Poland, the curriculum for the primary level of elementary school is implemented in an integrative way, without specifying content for each educational area. In the Czech Republic, the curriculum for the educational area "People and the World of Work" includes horticulture, which is not part of the planned curriculum in Slovakia.

At the lower secondary school level, Poland includes traffic education as part of the subject "Technology," where students learn the principles of safe behaviour in traffic as pedestrians and cyclists. Traffic education is not covered in the "People and the World of Work" curriculum in Slovakia or the Czech Republic.

In the Czech Republic, the content of "People and the World of Work" at the lower secondary level also includes topics focused on horticulture and animal care. These subjects are not part of the planned curriculum in Slovakia or Poland. The subject title for the educational area "People and the World of Work" is not specified in Czech schools, and the Czech elementary education system is divided into two levels.

Currently, Slovakia's curriculum also includes topics focused on horticulture, but as of 2026, these will no longer be included in the "People and the World of Work" area. Traffic education topics are likewise absent from the curriculum. In the near future, Slovakia will stand out with three components in its educational area, including career education (similar to the Czech Republic) and financial literacy and entrepreneurship—components not found in Poland's or the Czech Republic's technical education curricula. A significant difference will also be Slovakia's division of elementary education into three cycles, a structure not seen in Poland or the Czech Republic.

The quality and success of an educational institution are closely tied to its curriculum. A well-designed curriculum enhances educational quality, and vice versa (Mukhlason & Tarbiyah, 2022).

The presented elementary school technical curricula reflect each society's technological, scientific, cultural, and economic development and varied approaches to curriculum design. This review and comparison of technical curricula may be helpful in planning changes to technical subject content and supporting teachers, didactics experts, and researchers in their work.

ACKNOWLEDGEMENTS

This paper was prepared to address the needs of further education for teachers in the educational area "Man and the World of Work" under Project Number KEGA 018UKF-4/2023. This project has been funded with support from the Ministry of Education, Slovak Republic.

References

Hašková, A., & Lukáčová, D. (2022). Teaching Technology Within Lower Secondary Education and New Strategic Intentions. *Studia Scientifica Facultatis Paedagogicae*, *1*, pp. 135–147. DOI: https://doi.org/10.54937/ssf.2022.21.1.135-147

Konczal, M. (2023). Przedmioty w szkole podstawowej. Wykaz i wymiar godzin w klasach 1-3 oraz 4-8. To warto wiedzieć przed rozpoczęciem drugiego semestru. *Strefa edukacji*. https://strefaedukacji.pl/przedmioty-w-szkole-podstawowej-wykaz-i-wymiar-godzin-w-klasach-13-oraz-48-to-warto-wiedziec-przed-rozpoczeciem-drugiego/ar/c5-16697711

Ministerstwo Edukacji Narodowej. (2017). Rozporządzenie ministra edukacji narodowej z dnia 14 lutego 2017 r. [Regulation of the Minister of National Education of 14 February 2017]. https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20170000356/O/D20170356.pdf

Ministerstvo školstva, vedy, výskum a športu Slovenskej republiky. (2023a). Štátny vzdelávací program pre základné vzdelávanie [State educational program for basic education]. https://www.minedu.sk/data/files/11808_statny-vzdelavaci-program-pre-zakladne-vzdelavanie-cely.pdf

Ministerstvo školstva, vedy, výskum a športu Slovenskej republiky. (2023b). Vzdelávacie štandardy. Vzdelávacia oblasť Človek a svet práce [Educational standards. Educational field Man and the world of work]. https://www.minedu.sk/data/files/11817_clovek-a-svet-prace.pdf

Mukhlason, M., & Tarbiyah, J. (2022). Pengembangan kurikulum mata kuliah teknologi pembelajaran pai bebasis kkni yang berorientasi pada merdeka belajarkampus merdeka. *Jurnal Studi Islam 17*(2) pp. 114–125.

Národní ústav pro vzdělávání. (2021). Rámcový vzdělávací program pro základní vzdělávání – 2021 [Framework educational program for basic education - 2021]. https://archiv-nuv.npi.cz/t/rvp-pro-zakladni-vzdelavani.html

Národní ústav pro vzdělávání. (2013). Standardy pro základní vzdělávání. Člověk a svět práce [Standards for basic education. Man and the world of work]. https://digifolio.rvp.cz/artefact/file/download.php?file=67505&view=9832

Národný inštitút vzdelávania a mládeže. Inovovaný štátny vzdelávací program. [Innovative state education program]. (2014). https://www.statpedu.sk/sk/svp/inovovany-statny-vzdelavaci-program/

Santika, G., Suarni, N., & Lasmawan, I.-W. (2022). Analisis Perubahan Kurikulum Ditinjau Dari Kurikulum Sebagai Suatu Die. *Jurnal Education and Development*, *10*(3), pp. 694–700.