

TEACHER TRAINING FOR THE NEW ENTREPRENEURSHIP-FOCUSED CURRICULUM

FORMAÇÃO DE PROFESSORES PARA O NOVO CURRÍCULO CENTRADO NO EMPREENDEDORISMO

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Ivana Tureková*

*Constantine the Philosopher University in Nitra (UKF), Eslováquia

Orcid: <https://orcid.org/0000-0003-1419-8882>

iturekova@ukf.sk

Danka Lukáčová*

*Constantine the Philosopher University in Nitra (UKF), Eslováquia

Orcid: <https://orcid.org/0000-0003-0186-5447>

dlukacova@ukf.sk

Hilda Hyneková*

*Constantine the Philosopher University in Nitra (UKF), Eslováquia

Orcid: <https://orcid.org/0009-0001-1224-7655>

hilda.hynekova@ukf.sk

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Abstract

Slovakia's primary schools are set to implement a new curriculum in 2026, and its success hinges on whether teachers are ready for the changes. This article zeroes in on technology teachers, specifically looking at their preparedness for the content overhaul in their subject and their drive to put these reforms into practice. With the content of technology education undergoing a fundamental shift – this research aimed to gauge teachers' readiness to teach the updated material. It also assessed their motivation to participate in further training to prepare for these changes, and explored their preferences regarding such professional development. The research was conducted using a custom-designed questionnaire that was sent to teachers. We analysed the respondents' answers (462 respondents) using descriptive statistical methods. Analysis of teacher responses revealed a strong intrinsic motivation for further education. However, they feel the current state-run training options are inadequate. Teachers are particularly keen on innovative distance or blended learning opportunities. Their preference is for training focused on new methods and teaching approaches in technology, especially hands-on activities in electrical engineering, electronics, and robotics that they can implement with students. Considering these perspectives is essential for successfully integrating the reform into teaching.

Resumo

As escolas de ensino fundamental da Eslováquia devem implementar um novo currículo em 2026, e o sucesso dessa iniciativa depende da preparação dos professores para as mudanças. Este artigo concentra-se nos professores de tecnologia, analisando especificamente sua preparação para a reformulação do conteúdo da disciplina e sua motivação para colocar essas reformas em prática. Com o conteúdo do ensino de tecnologia passando por uma mudança fundamental, esta pesquisa teve como objetivo avaliar a prontidão dos professores para ensinar o material atualizado. Também avaliou sua motivação para participar de treinamentos adicionais a fim de se preparar para essas mudanças e explorou suas preferências em relação a esse desenvolvimento profissional. A pesquisa foi conduzida por meio de um questionário personalizado enviado aos professores. Analisamos as respostas dos participantes (462 respondentes) utilizando métodos estatísticos descritivos. A análise das respostas dos professores revelou uma forte motivação intrínseca para a formação continuada. No entanto, eles consideram que as opções atuais de treinamento oferecidas pelo governo são inadequadas. Os professores demonstram particular interesse em oportunidades inovadoras de ensino à distância ou de aprendizagem combinada. Sua preferência é por treinamentos focados em novos métodos e



Keywords: Curriculum, Reform, Professional Development.

abordagens de ensino em tecnologia, especialmente atividades práticas em engenharia elétrica, eletrônica e robótica que possam ser implementadas com os alunos. Considerar essas perspectivas é essencial para integrar com sucesso a reforma ao ensino.

Palavras-chave: Currículo. Reforma. Desenvolvimento Profissional

1 INTRODUCTION

Perceived stagnation and declining student performance compared to the OECD average often catalyse education reform (Ferencová & Štuřáková, 2024; Gordon *et al*, 2024). Similar to the waves of education reforms driving national and local change internationally (Sahlberg 2011), the need for curriculum reform is emerging in Slovakia as well (Choi & Walker, 2018).

The category of school curriculum appeared in Slovak (Czechoslovak) pedagogical discourse only in the 1990s. Initially, it replaced the notion of syllabus. The current conception has a more complex character (Zimenová, 2009). The curriculum not only provides educational content but also gives them meaning, organisational form and defines the value orientation of all the processes that take place in the school in connection with education. The school curriculum determines the content, normative and procedural aspects of its functioning, which is shaped by the historical, cultural, economic, and political conditions within which it exists (Porubský, 2023).

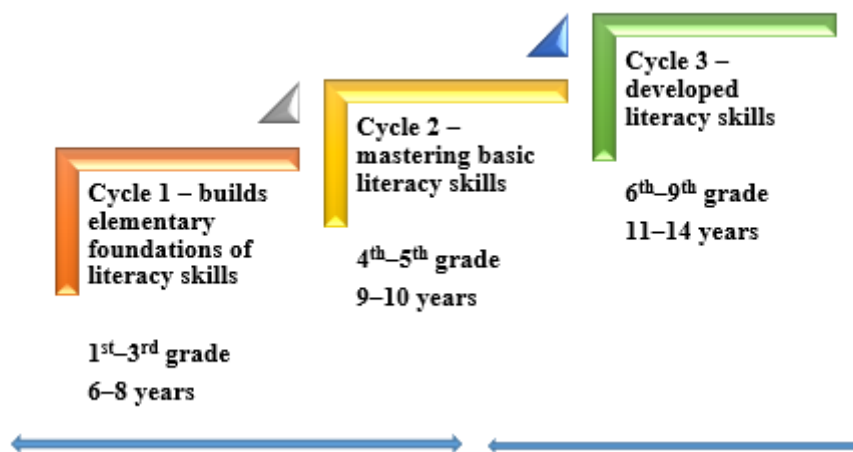
In the Slovak Republic, the first activities related to the implementation of curricular reform in primary education occurred in 2021 (Rochovská & Huřová, 2021). Reform is understood as a process or series of changes that are introduced to improve, transform or adapt existing structures, systems or practices in a particular area (Barčíková, 2023). The result is a significant improvement and strengthening of basic education in the education system, adapting the goals, content and forms of education to the needs of the current and promising society and the current and emerging generation of children (Balgová & Švecová, 2023). Further, there is an improvement in the educational outcomes of students in the basic areas of literacy, ensuring equity, equality and accessibility in education, and building a primary school system where each school can create conditions for quality education (Hlebová, 2024; Pupala *et al*, 2022).

2 REFORM OF PRIMARY AND LOWER SECONDARY EDUCATION IN THE SLOVAK REPUBLIC

Primary education in the Slovak Republic has nine grades (zákon 245/2008 Z. z.). The internal structure of the new primary education curriculum reflects the necessary diversity of pupils' learning paths and is organised into three consecutive and interdependent learning cycles (Figure 1) (Hašková & Lukáčová, 2022a, Borbélyová & Miňová, 2024). The cycles set the expected learning outcomes for pupils in the individual learning domains and their components (performance standards at the end of each cycle) and also set the content of learning (content standards).

Figure 1

Division of primary education into cycles according to the new curriculum (MŠVVV, primary education lower secondary education 2023)



The educational area is the basic unit of educational content, and through it, the objectives of general education are gradually defined and fulfilled (Ferencová & Šut'áková, 2024). The educational areas of primary education are related to the same educational areas in pre-primary education. The educational areas are divided into 7 areas: Language and Communication, Mathematics and Computer Science, Man and Society, Man and Nature, Man and the World of Work (MWW), Art and Culture, Health and Movement. The primary education curriculum in Slovakia was divided into educational areas and specific subjects starting in 2008. This division, which established seven educational areas and their corresponding subjects, was implemented by Act No. 245/2008 Z. z. One of these areas, Man and the World of Work, originally included two

subjects: Vocational Education for the lower primary level and Technology for the lower secondary level (Lukáčová, 2010; Pavelka, 2011). The subject of technology was taught by a teacher with a qualification to teach the subject, and in the future, it is assumed that these teachers will also teach the educational area of Man and the World of Work.

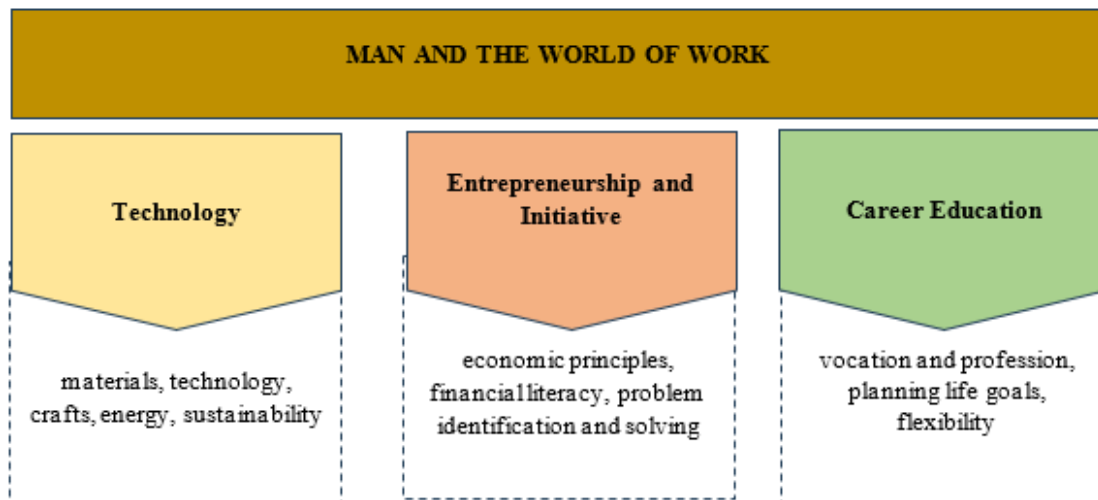
2.1 A Review of changes in the man and the world of work educational domain

Education must adapt to the growing importance of technology. Given the need to increase technological literacy—particularly the ability to think critically about product, system, and environment design to solve practical problems (Domingo & Garganté, 2016; Jones & Moreland, 2004; Rohaan, Taconis, & Jochems, 2012)—new educational frameworks are essential. Consequently, the evolving social and economic landscape required the Slovak Republic to reform its curriculum by modifying the MWW educational area. Digitalisation, automation and globalisation of society significantly affect the requirements of the labour market, to which the school must respond by changing the content of the educational area in question. The school should enable the pupil to acquire the basics of technical literacy, orientation in professions and careers, as well as to create an environment for initiative and independence in solving problems and various life situations.

The structural foundation of the MWW educational area in the new curriculum is divided into three components: Technology, Entrepreneurship and Initiative, Career Education (Figure 2) (Beisetzer, 2024). All three components are interconnected so that the emphasis is on the development of technical, creative, and critical thinking in the educational area (Lukáčová, Bánesz & Komárová, 2025).

Figure 2

Components with individual categories in the educational area of Man and the World of Work



The content of the Technology component focuses on the development and acquisition of technical skills, mastering various technological processes using digital technologies. This area encompasses a broad spectrum of work-related activities, enabling pupils to gain basic user skills across various fields of human endeavor. Furthermore, the Entrepreneurship and Initiative component aims to foster entrepreneurial thinking and a deeper appreciation for the value people create through their own labor. The content of the Career Education component focuses on planning for the future and the related employment of pupils in the labour market. This area was included in the previous curriculum, but not with such a clear focus and link to the development of technical literacy, which is seen as a pillar of many future career positions (occupations).

Concerning pupils' learning outcomes, the authors of the reform assume that they will be able to better orient themselves in the world of technology, understand more about the trends of technological development, understand the context of scientific and technological progress, reflect on the impact of human activity on the world, and reflect on their technical ideas, also taking into account the environmental burden.

2.2 Comparison of the existing technology curriculum with the content of the planned educational area of Man and the World of Work

The Technology component aims to equip pupils with practical skills in working with technical materials and tools. Through practical tasks, they will learn working procedures and how to use technologies, analyse work, evaluate solutions and carry out their projects. The core of this part is the complete lifecycle of a product, from initial concept and planning all the way to final presentation. This content also links technical skills with practical knowledge of energy use, craft techniques, and environmental considerations, serving as an expansion of the existing technology curriculum. (Hašková & Lukáčová, 2022b).

The Entrepreneurship and Initiative component aims to teach pupils to work in teams and to understand that their work can make a real and positive difference to other people or society as a whole (Bhoyar, Chitrao & Divekar, 2025; Chaker & Jarraya, 2021). It creates an environment where they can create freely and come up with ideas that have practical meaning. They learn how to seek out opportunities to develop their ideas and execute them independently. At the same time, they are exposed to working with others on joint projects and solving problems. Pupils also learn the basics of economics, how to manage money and other resources, to understand a fair reward for work, and how to be responsible when implementing their ideas at home. They recognise the value people create through their work (Kolho, 2024).

This component is a novelty for teachers compared to the previous approach, where entrepreneurship and financial literacy were covered continuously in different subjects if the teacher saw fit. For example, in technology, only topics such as material budgeting in manufacturing or energy consumption calculations from a consumer's perspective were previously addressed (MŠVVM, 2023).

The Career Education component is specifically designed to equip pupils with the necessary skills for making major life decisions and effectively planning their future. Pupils will learn about different careers, what job opportunities are available and what they can pursue after primary school (Mutaufiq, Trimulyana & Sunarsi, 2025). These topics have already been part of technology. However, the new curriculum also adds topics to help pupils critically evaluate their skills and talents, learn to develop them purposefully and be creative in how they can use them in their future professional lives.

These topics, which also touch a little on psychology, are new in this educational area. It is therefore to be expected that teachers may not be fully prepared for these changes.

Therefore, when introducing these innovations, much attention should be paid to educating teachers so that they identify with the new content and are motivated to develop further (Flores, 2016).

3 METHOD

The success of curriculum reform is inherently contingent upon the level of support and preparedness within the teaching community. Since new educational frameworks do not provide specific methodological guidelines for direct instruction, the primary responsibility for transforming educational goals into classroom practice rests with the teachers. Implementing these visions requires not only the adoption of new strategies but often a profound shift in educators' attitudes, knowledge, and professional beliefs. In light of the ongoing reform processes, our research focused on assessing the readiness and motivation of technology teachers to effectively implement changes within the "Man and the World of Work" (MWW) educational area.

The primary objective was to identify the key factors influencing teacher motivation for professional development and to determine their preferences regarding the topics and formats of further education. To achieve this, we formulated the following research questions:

Q1: What are the dominant factors driving technology teachers (MWW) to seek further professional development?

Q2: Do technology teachers have adequate access to relevant educational opportunities?

Q3: Which organizational forms of education do teachers primarily prefer?

Q4: What types of further education are teachers most interested in?

Q5: Which professional topics do teachers consider crucial for their further development?

Q6: How do teachers subjectively rate their competence to teach the innovated content of the MWW educational area?

A custom-designed electronic questionnaire targeting technology teachers served as the primary data collection tool. The questionnaire consisted of 13 items (excluding

demographic data), utilizing semi-closed questions, scaled items, and one open-ended item for a more in-depth expression of perspectives. The survey was conducted in 2024 via email distribution to all 1,186 primary schools (approximately 1,186 technology teachers) in the Slovak Republic (MŠVVM, 2025). The request specifically targeted teachers currently teaching Technology, as it is assumed they will also implement the new MWW curriculum.

4 RESULTS

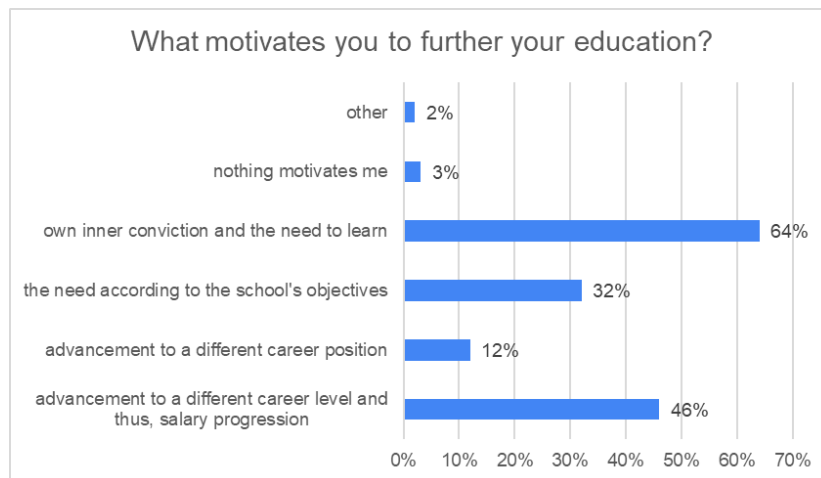
A total of 462 fully completed questionnaires were collected. Respondents represented all self-governing regions of Slovakia, with the highest participation from the Prešov and Žilina regions (Table 1). In terms of age structure, the largest groups were teachers aged 41–50 (38%) and 51–60 (33%). The gathered data were processed and evaluated using descriptive statistical methods.

Table 1

Respondent structure

Region	%	age	%
Bratislava Region	9 %	up to 30 years	5 %
Košice Region	5 %	31-40	20 %
Nitra Region	16 %	41-50	38 %
Prešov Region	12 %	51-60	33 %
Trenčín Region	18 %	over 60 years	4 %
Trnava Region	14 %		
Žilina Region	9 %		
Bratislava Region	18 %		

Next, we investigated the factors that motivate respondents to pursue further education (Figure 3). We structured this question to allow multiple selections, letting teachers choose from four offered options or write in their own answer.

Figure 3*Motivation to learn***4.1 Regarding question Q1**

The most dominant factor driving teachers was intrinsic motivation—specifically, the belief that they need to continually educate themselves within their professional field. Ranking second was extrinsic motivation in the form of financial rewards, such as the possibility of promotion to a higher career level and the corresponding salary increase. Unfortunately, sixteen respondents indicated that nothing motivates them to pursue further education. These individuals are likely older teachers who lack the drive for continued growth, whether it be intrinsic (personal interest) or extrinsic (salary benefits). Reasons listed in the "other" category mainly included: meeting other teachers, having satisfied and happy pupils, and encountering an interesting training offer.

4.2 Regarding question Q2

We investigated how respondents evaluate the educational offerings provided by NIVAM (the National Institute of Education and Youth, an organization overseen by the Ministry of Education, Research, Development and Youth of the Slovak Republic) and other relevant organizations (Table 2).

Only 21 % of respondents are completely satisfied with the offer of NIVAM, an organisation providing teacher training. NIVAM often uses resources from EU funds for implementation and therefore focuses on courses that most teachers can use in their

teaching practice. There is only a small number of subject-specific courses to be found on its website.

Table 2

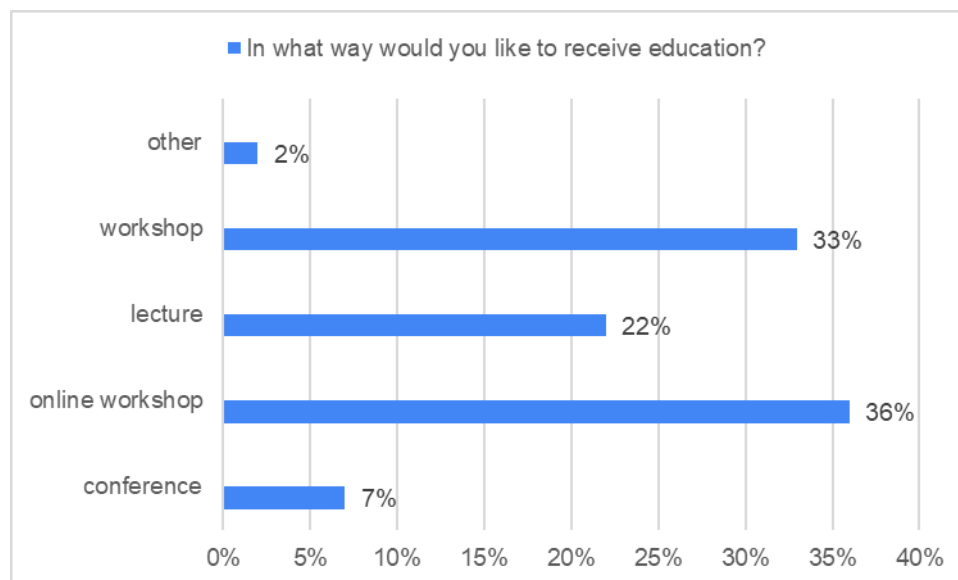
Training Offer Evaluation

Response	How do you evaluate NIVAM's training offer?	What is your opinion of the educational opportunities offered by other providers?
I don't have any information about it	21 %	14 %
I'm not interested	3 %	2 %
the offer is sufficient for me	21 %	25 %
the offer is partially sufficient for me	32 %	42 %
the offer is insufficient for me	23 %	16 %

The other item of the questionnaire specified the organisational form of training (Figure 4). Teachers could choose one of the suggested options or propose an alternative.

Figure 4

Organisational forms of preferred education



4.3 Regarding question Q3

Respondents were most interested in online workshops, workshops and lectures. From the selected forms of learning, it can be assumed that most of the teachers want to

be educated in topics where some practical skills are needed, and therefore they chose workshops or online workshops. The lowest preference was recorded for conferences. In the 'other' option, the responses were: a combination of several, none.

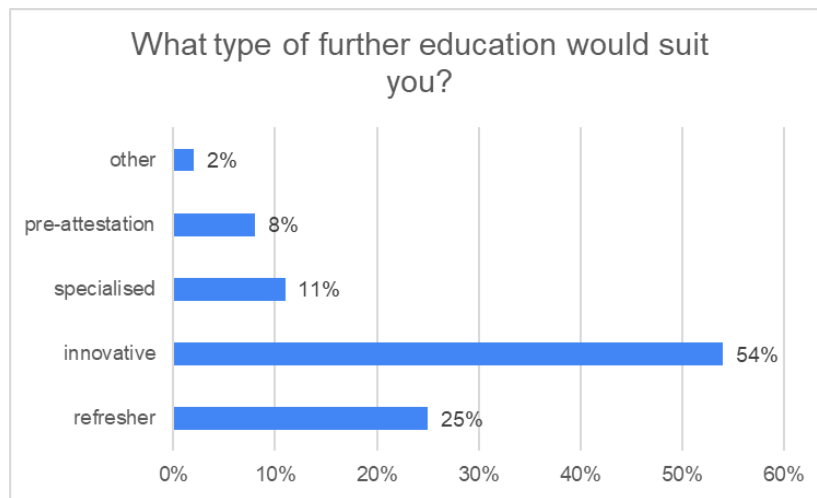
In the next part of the questionnaire, we explored what topics would be of interest to respondents (Table 3). The item was open-ended, and respondents could enter more requests. We sorted the responses into categories.

4.4 Regarding question Q4

We surveyed what type of education respondents would prefer (Figure 5). They had a choice of five responses, including 'other'. Most teachers prefer innovative education during selection. Following it is refresher education. Other types of education included: functional, qualification, and extension education. Respondents clearly prefer either combined learning (43%) or distance learning (39%) for their professional development. This preference likely depends on the specific topic:

- For more theoretical subjects that do not require the acquisition of practical motor skills, teachers probably choose entirely distance learning.
- However, for topics focused on gaining practical skills, teachers tend to prefer the combined form (blending online and in-person instruction).

This strong preference for combined learning may also indicate a desire for in-person meetings and networking, which aligns with the motivation to "meet other teachers" found in an earlier question.

Figure 5*Types of preferred education***4.5 Regarding question Q5**

The top interests among respondents for further training were new teaching methods and forms, alongside general innovations and opportunities for exchanging experiences with colleagues who teach the MWW educational area. Regarding specific skills, teachers indicated a need to acquire new competencies in digital literacy, including the use of mobile phones, 3D modeling, and robotics. The "other" category represents respondents who either chose not to answer, indicated they did not know, or did not wish to state a preference.

Table 3*Areas of educational interest*

What would you like to learn in continuing education?	
methods and forms	13.9 %
innovations in teaching, exchange of experiences with colleagues	9.5 %
guidance on practical activities	8.2 %
working with materials, creative activities	5.4 %
motivation	4.8 %
new skills	4.5 %
3D printing, robotics	2.6 %
electronics, electrical engineering	2.4 %
modern technologies	2.2 %
ICT	1.9 %
how to obtain materials for teaching	0.9 %
traditional crafts	0.6 %
ecology, recycling	0.4 %
housing installations	0.4 %
how to assess pupils' skills	0.4 %

other

17.3 %

4.6 Regarding question Q6

The remaining questionnaire items assessed how ready teachers are to cover the various thematic units defined by the new state educational program for MWW, which begins in Slovakia in September 2026. We investigated how respondents assess their abilities to teach the components of the educational area of MWW: the component Technology, the component Career Education and the component Entrepreneurship and Initiative. In each component, we looked at teachers' competencies concerning specific thematic units. Respondents could rate their competence to teach a given thematic unit on a scale of 1–5: (1 –outstanding, 5 – unacceptable).

We calculated basic statistical indicators for each thematic unit to make the differences between thematic units easier to compare (Table 4).

Teachers reported their highest levels of competency in subjects that are already stable themes within the MWW curriculum. Specifically, the best ratings were in: History of technology and technical drawing (mean: 2.09, mode: 1), Use of technical materials (mean: 2.08, mode: 2).

In contrast, the topics Decision-making and Creating an Action Plan (mean 2.47, mode 2), Work-life Balance and Wellbeing (mean 2.36, mode 2), and Sources of Funding for Ideas (mean 2.43, mode 2) are the topics for which they are least competent. These are topics new to the proposed curriculum, and teachers will need effective and targeted support to be well prepared to teach them by 2026.

Table 4

Descriptive statistics for thematic units

	<i>M</i>	<i>SE</i>	<i>Mdn</i>	<i>Mode</i>	<i>SD</i>	<i>SV</i>
Technology						
Exploring Engineering Materials and Their Properties	2.18	0.05	2	2	1.03	1.05
Constructions Around Us	2.30	0.05	2	2	1.02	1.05
Exploring Traditional and Modern Engineering Environments	2.35	0.05	2	2	1.01	1.02
Exploring the History of Technology and the Graphic Communication	2.09	0.05	2	1	1.03	1.07
Using the Properties of Engineering Materials	2.08	0.05	2	2	0.99	0.97

Exploring the Use of Simple Machines and Mechanisms	2.19	0.05	2	2	0.99	0.99
Career Education						
Self-reflection and Feedback	2.10	0.04	2	2	0.86	0.74
Career Portfolio as a Tool for Developing Student's Potential	2.35	0.04	2	2	0.93	0.86
Decision-making and Creating an Action Plan	2.47	0.04	2	2	0.93	0.87
Education and the Labour Market	2.13	0.04	2	2	0.93	0.87
Work-life Balance and Wellbeing	2.36	0.04	2	2	0.94	0.88
Entrepreneurship and Initiative						
Selection of Ideas	2.02	0.04	2	2	0.91	0.82
Human Work and Its Influences	2.00	0.04	2	2	0.90	0.80
Implementation of an Idea and Verification of Its Functionality	2.14	0.04	2	2	0.93	0.87
Problem Solving	2.14	0.04	2	2	0.90	0.81
Sources of Funding for Ideas	2.43	0.04	2	2	0.96	0.91

The thematic units from the components Career Education and Entrepreneurship and Initiative: Sources of Funding for Ideas (mean 2.43), Work-life Balance and Wellbeing (mean 2.36), Decision-making and Creating an Action Plan (mean 2.47) had the highest mean, i.e., teachers rated their competencies in these thematic units as the weakest. These thematic units are new to the teachers, and this is likely why they feel insecure when evaluating their own professional competence to teach these topics.

5 DISCUSSION AND CONCLUSION

When analyzing the research questions, we found that intrinsic motivation—the belief in the need for continuous professional education—dominated the respondents' answers. This is a positive sign for the reform, as motivated teachers are essential for its successful implementation (Borko, Elliott & Uchiyama, 2002; Dostál & Prachagool, 2016). Motivation in the form of financial rewards—placing the teacher in a higher career level and thus his/her salary advancement—ranked second. Unfortunately, the responses also included 16 respondents who were no longer motivated by anything to further their education. These are probably older teachers who no longer have the motivation for further growth (either intrinsic or extrinsic – salary).

Although most teachers feel motivated to support the intended reforms, they perceive a lack of necessary support from state-run institutions, particularly concerning

in-service training courses. This is reflected in the fact that only 21 % of respondents are completely satisfied with the offerings provided by NIVAM, the organization responsible for teacher training. Similarly, the offers of other institutions offering further training are only partially satisfactory for technology teachers (42 % of respondents).

There are currently three courses for teachers in the MWW education area on the NIVAM website, and all three are for primary teachers. There is no course offered for secondary teachers (NIVAM, 2025).

Similarly, the offers of other institutions that provide continuing education courses are only partially suitable for teachers of the educational area of MWW. This may also be due to the fact that this is a relatively young subject, although it has been taught in this form since 2015, and institutions do not have enough qualified lecturers. The data incidentally shows a deficiency of qualified teachers within the schools. This observation is critical, considering that several authors assert the success of curriculum changes relies fundamentally on professionally and methodologically prepared educators (Putnam & Borko, 2000).

Most teachers prefer innovative learning when planning their professional growth. Respondents prefer distance or combined forms of learning for further education. Respondents are most interested in online workshops, workshops and lectures, with conferences being the least appealing form of learning for teachers.

The findings suggest that despite the general presence of both intrinsic and extrinsic (financial) motivation, a dedicated portion of the teaching staff lacks the motivation for continuous education. Although most teachers show a willingness to the reform intentions, they experience a significant lack of relevant and accessible offer of in-service training courses by state institutions, especially for secondary teachers in the area of MWW. The current offer of NIVAM and other institutions only partially covers the needs of teachers of technology and the educational area of MWW.

Teachers prefer innovative, distance or combined forms of learning, with the greatest interest in online workshops, workshops and lectures. Key areas of interest for learning were identified, such as new methods and forms of teaching technology, innovation and exchange of experiences, as well as the need to develop digital competences, use of mobile phones, 3D modelling and robotics. Teachers perceived the biggest gaps in their competencies to be in the areas of decision-making, action plan creation and sources of funding for ideas in the upcoming curriculum. These findings

were subsequently reflected in their requirements for the content of further education, where suggestions for students' practical activities in technology and topics in electrical and electronics engineering dominated.

In conclusion, it can be recommended that government institutions, especially NIVAM, should review and expand their offer of in-service training courses for teachers of technology and the educational area of MWW at the secondary level of education. Emphasis should be placed on innovative and practically oriented courses, using preferred distance and combined forms of learning, and focusing on teachers' identified needs in the areas of new teaching methods, digital competences and specific professional topics such as electrical and electronic engineering, the creation of an action plan, and sources of funding. An increased and relevant supply of training could contribute to enhancing teacher motivation and the successful implementation of education reform intentions.

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Authors' Contributions

All authors contributed equally to the development of this article.

Data Availability

All datasets relevant to the results of this study are available in full in the article.

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