

Curiosity-Driven Change: Evaluating AI Tools and Teacher Preparedness in Slovak VET

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Abstract

This article explores the readiness of Slovak vocational education and training (VET) teachers to integrate artificial intelligence (AI) into their practice, as part of the Erasmus+ project VETAssist – Artificial Intelligence as VET Teacher Assistant (No. 2024-1-HU01-KA220-VET000253387). Building on earlier tool evaluations, the study analyses national findings from interviews and questionnaires that reveal stark contrasts between AI pioneers, teachers who actively experiment with tools like ChatGPT, Canva, or Copilot, and non-pioneers, who remain cautious due to lack of training, infrastructure, or institutional support. A key outcome of the project is the evaluation of 37 AI tools across categories such as chatbots, lesson design, assessment, collaboration, and media creation. Tools like Padlet, Fobizz, Miro, and Microsoft Copilot stood out for their pedagogical relevance and ease of use. While many tools offer free access, concerns persist about data privacy, limited non-English functionality, and reliance on premium features. In response to these gaps, the project has developed a modular training programme to be piloted in autumn 2025, aimed at equipping VET teachers with AI literacy, ethical awareness, and practical skills. The article argues that a structured, context-sensitive approach, combining professional development with critical reflection, is essential for responsible AI adoption in Slovak VET schools.

Keywords: Artificial Intelligence, Vocational Education and Training (VET), AI Literacy, Teacher Readiness, Educational Technology

1 Introduction

Artificial intelligence (AI) is increasingly influencing teaching and learning worldwide, offering new possibilities for personalisation, material creation and administrative efficiency (Tan, Cheng, & Ling, 2025; Moroianu, Iacob, & Constantin, 2023). Research shows that teachers'

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confidence, digital skills and institutional support strongly determine whether AI becomes a meaningful part of everyday practice (Granström & Oppi, 2025). These issues are particularly relevant in vocational education and training (VET), where teachers must respond to technological change while supporting diverse learners and industry-linked curricula (Cedefop, 2022; Jeon, 2025).

In Slovakia, discussions around AI in education are growing, yet empirical insights from the VET sector remain limited. Recent work by Pondelíková (2025) shows that AI tools can enrich university teaching and enhance students' engagement, but similar evidence from VET is still lacking. The Erasmus+ project *Artificial Intelligence as VET Teacher Assistant* (VETAssIst) aims to address this gap by exploring how AI can support VET teachers' work and by developing training resources that reflect their needs and levels of readiness.

This study therefore examines how Slovak VET teachers perceive AI, what motivates or discourages them from using it, and how the experiences of active AI users ("pioneers") differ from those of teachers with limited AI engagement. By addressing these questions, the paper contributes to understanding the conditions necessary for responsible and effective AI integration in Slovak VET.

2 Theoretical background

2.1 AI in VET and Teacher Readiness

Artificial intelligence (AI) has become a significant driver of change in teaching and teacher professional development. Recent systematic reviews show that AI is mainly used to personalise learning, automate routine tasks (e.g., grading, feedback), and generate analytics that can guide instructional decisions (Tan & Cheng, 2025). In vocational education and training (VET), these functions are closely tied to labour-market demands: AI is used to simulate authentic workplace scenarios, monitor practical skills, and support practice-oriented learning pathways (Ghosh & Ravichandran, 2024; Jeon, 2025).

A growing body of VET literature emphasises that the impact of AI depends strongly on teacher agency. Studies on emerging technologies in VET argue that AI, along with VR, robotics and other tools, can enhance engagement and skills development only when teachers have the competences and time to redesign tasks and assessments, and when infrastructure is reliable (Ghosh & Ravichandran, 2024; Jeon, 2025). Research on AI-supported teacher teams in Chinese vocational schools similarly highlights the need for institutional strategies, intelligent training platforms and supportive evaluation systems if AI is to contribute to "high-quality development" rather than remain a series of isolated pilots (Yao, 2025).

Across education systems, teacher readiness has emerged as a key predictor of whether AI is actually taken up in classrooms. A large-scale Estonian survey (N = 3,848) found that teachers who already use AI tools report significantly higher readiness and perceived usefulness, whereas non-users most often cite lack of knowledge, guidance and infrastructure as reasons

for not adopting AI (Granström & Oppi, 2025). Complementary work using a compartmental mathematical model conceptualises teachers as moving between states such as "unaware", "aware", "adopter" and "discontinued user". The model suggests that adoption can be fragile: without sustained support, some teachers revert from adopters to non-users, which underlines the importance of long-term resource provision and professional development rather than one-time initiatives (Ayanwale et al., 2025).

These findings resonate with qualitative and review studies showing that teachers often fall into two broad groups: early adopters or "pioneers", who experiment with AI, and non-pioneers, who remain hesitant due to limited training, ethical concerns or perceived misalignment with curriculum demands (Tan & Cheng, 2025; Jeon, 2025). In VET, this divide may be even sharper, because teachers must track both educational and technological developments in specific sectors (e.g., manufacturing, logistics, health care). The Slovak context discussed in this article aligns with these international trends and allows a more fine-grained analysis of how pioneers and non-pioneers position themselves toward AI tools in VET practice.

2.2 AI Literacy, Competency Frameworks and Professional Development for VET Teachers

As AI becomes embedded in education systems, there has been a shift from viewing AI use as an individual teacher choice towards conceptualising AI literacy and competencies as part of professional standards. AI literacy is generally understood as a combination of knowledge, skills and attitudes that enable individuals to use AI tools critically, understand how they work, recognise their limitations and societal impact, and make responsible decisions about when and how to rely on them (OECD, 2025).

At policy level, the UNESCO AI Competency Framework for Teachers (AI-CFT) defines 15 competencies across five dimensions: human-centred mindset, ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning (UNESCO, 2024). The framework stresses that AI should strengthen rather than replace teachers, and that educators need not only technical skills but also ethical awareness and reflective capacity to work within a "teacher - AI - student" triangle. Building on similar principles, the ALLit Framework developed by the OECD and European Commission proposes AI literacy domains such as understanding, using, creating with and evaluating AI, again emphasising critical thinking and responsible use (OECD, 2025).

From a more bottom-up perspective, Filo, Rabin and Mor (2024) co-created an AI competency framework for teachers and students with practising educators. Their design-based study identifies competencies such as explaining AI mechanisms at a basic level, integrating AI into learning activities, exercising agency in co-creating value with AI, and addressing ethical issues explicitly in the classroom (Filo et al., 2024). This work underscores that AI competences must be contextualised in local school cultures, rather than imported as purely technical standards.

For VET, these generic frameworks meet the broader digitalisation strategies. European policy analyses argue that VET teachers need "dual" competences: the ability to integrate digital and AI tools into practice-oriented pedagogy and work-based learning, and the capacity to keep up with AI-driven changes in their occupational fields (Jeon, 2025; Cedefop, 2025). Reports stress that large-scale, sustained professional development (PD) and upgraded infrastructure are necessary to avoid widening gaps between well-resourced and under-resourced VET institutions.

Evidence from AI-related PD research supports this view. Tan and Cheng's (2025) systematic review shows that brief, tool-centred workshops rarely change practice; more effective are modular programmes that combine technical training with pedagogical design and ethical reflection (Tan & Cheng, 2025). Studies of VET teacher teams similarly recommend collaborative PD models that build shared resources, intelligent training platforms and supportive evaluation mechanisms (Yao, 2025). Instruments such as readiness scales and AI-related self-efficacy measures are now being used to track how PD influences teachers' willingness and capacity to work with AI over time (Granström & Oppi, 2025; Ayanwale et al., 2025).

Against this backdrop, the modular training programme developed in the VETAssist project can be positioned as a context-sensitive attempt to translate international AI competency frameworks into the specific realities of Slovak VET: balancing technical tool use (e.g., chatbots, lesson-design tools, media creation) with pedagogical redesign, ethical awareness and differentiated support for AI pioneers and non-pioneers.

3 Project Context and Summary of AI Tool Evaluation

The Erasmus+ project *Artificial Intelligence as VET Teacher Assistant* (VETAssist; Project No. 2024-1-HU01-KA220-VET-000253387) was launched to support vocational education and training (VET) teachers in adapting to the rapid spread of artificial intelligence (AI) in education. The project aims to strengthen teachers' digital and pedagogical capacities by promoting AI as a supportive assistant in lesson planning, content creation, assessment, classroom interaction, and administration. The broader intention is not to replace educators, but to provide tools that reduce routine workload, encourage innovative practices, and support more inclusive and personalised forms of learning.

To support these aims, the project partners from Hungary, Serbia, Germany and Slovakia conducted a structured evaluation of **37 AI tools** to determine which applications are most suitable for VET contexts. The evaluation was carried out collaboratively across all partner institutions and focused on tools that were freely available or low-cost, user-friendly, and relevant for teachers across different vocational fields. The tools were grouped into several functional categories, including:

- *Chatbots*: ChatGPT, Microsoft Copilot, Perplexity, Pi, Claude, DeepSeek, Gemini, Grok AI

- *Collaboration and brainstorming tools:* Miro, Padlet, Jambot (Figma), Canva for Education
- *Lesson and content generators:* Fobizz, SchoolAI, MagicSchool, Eduaide, Curipod, TeachAid, Diffit, Twee, Roshi
- *Assessment creators:* Quizizz, Conker AI, Formative AI
- *Design and media tools:* Canva, Freepik, Adobe Firefly, Microsoft Designer, Gamma, AutoDraw

Several key insights emerged from the partner evaluation. **Chatbots** were identified as the most versatile category, offering support for designing lesson plans, creating handouts, drafting quizzes, summarising documents, and generating administrative communication. Collaboration platforms such as **Miro** and **Padlet** were highlighted for encouraging interactive brainstorming and group work - an asset for practical, project-based VET learning. Lesson-design platforms like **Fobizz** were appreciated for their comprehensive free access, while others (e.g., Eduaide, TeachAid, Twee) restricted generation volume or advanced features in their free versions. Assessment tools (such as Quizizz and Conker AI) enabled quick creation of quizzes and formative tasks, though usage caps were common. Media-creation tools like **Canva for Education** stood out for ease of use and strong support materials.

At the same time, project partners identified several barriers to sustainable use. Many platforms offered **limited free functionality**, often requiring mandatory registration or paid upgrades. **Language support** varied significantly: while tools like ChatGPT and DeepSeek handled non-English input effectively, other platforms produced inconsistent translations - a challenge for Slovak VET environments. Concerns were also raised regarding **data privacy**, **integration with existing learning management systems**, and the long-term reliability of free plans. Tools that offered clear tutorials and help resources, such as Canva and Formative AI, were perceived as easier to adopt, particularly for teachers with lower digital confidence.

The evaluation resulted in a curated, category-based overview of AI tools with strong pedagogical potential for VET. These findings informed the selection of tools to be showcased in upcoming project outputs, including a multilingual e-book and a modular online training programme. Importantly, the evaluation also highlighted areas where teachers may need additional support, such as ethical and privacy considerations, language-related challenges, and strategies for critically interpreting AI-generated content.

With this foundation in place, the project proceeded to examine how VET teachers themselves perceive AI. The next chapter therefore presents the methodological approach used to analyse interview data collected from Slovak VET teachers, both AI pioneers and non-pioneers, regarding their readiness, attitudes, and support needs in adopting AI tools.

4 Methodology

4.1 Research design

This study employed a **qualitative research design** using semi-structured interviews to explore how Slovak vocational education and training (VET) teachers perceive and use artificial intelligence (AI) in their pedagogical practice. The qualitative approach was chosen to gain an in-depth understanding of teachers' motivations, experiences, challenges, and expectations related to AI integration, and to allow meaningful comparison between two teacher groups: **AI pioneers** and **non-pioneers**. Semi-structured interviews enabled participants to express their views freely while ensuring consistency across interviews through a shared set of guiding questions.

The interview protocol was jointly designed within the VETAssist project and focused on four thematic areas: (1) AI adoption and motivation, (2) practical use of AI in teaching, (3) institutional conditions and barriers, and (4) future perspectives on AI in VET.

4.2 Research Questions

This study was guided by the following research questions, which reflect the aim to understand how Slovak VET teachers perceive and integrate artificial intelligence in their professional practice and how these experiences differ between teacher groups:

RQ1: How do Slovak VET teachers perceive the opportunities and challenges associated with the use of artificial intelligence in their teaching practice?

RQ2: What factors motivate or hinder VET teachers in adopting AI tools for lesson preparation, classroom activities, and administrative tasks?

RQ3: How do the experiences, attitudes, and support needs of AI pioneers differ from those of non-pioneers in Slovak vocational education?

4.3 Participants – Research Sample

The research sample consisted of ten vocational education and training (VET) teachers from Slovak secondary schools. Participants represented a range of school types, including vocational secondary schools, industrial schools, specialised technical schools, and combined secondary schools. For the purposes of the study, teachers were categorised into two groups based on their self-reported experience and engagement with artificial intelligence tools: AI pioneers and non-pioneers.

AI Pioneers

The pioneer group comprised five teachers, predominantly women (4 women, 1 man), aged between 31 and 60 years. Their teaching experience ranged from 6 to 30 years. These teachers

worked at schools specialising in electrical engineering, industrial informatics, information and digital technologies, agriculture, and services and hospitality. Subjects taught included:

- Programming, applied informatics, networking technologies, and technical graphics
- English language
- Slovak language and literature, biology
- Economic and IT-related subjects (e.g., project management, innovation and entrepreneurship)
- Digital communication and practical vocational training

This group represented a diverse set of disciplinary backgrounds, though with a notable concentration in technical and IT-oriented fields.

Non-Pioneers

The non-pioneer group also consisted of five teachers, all over the age of 41, with a predominance in the 51–60+ age range. All were women except one male participant. Their teaching experience varied from 4 to 33 years. These teachers were employed at schools specialising in electro energetics and industrial informatics, construction and geodesy, agriculture, and hospitality and food industry. Subjects taught included:

- Operating systems, server and network technologies
- Mathematics
- Economics, accounting, English language, physical education
- Chemistry and food-processing technologies
- English language

Compared to pioneers, the non-pioneer group also represented a wide range of vocational domains, with some overlap in technical specialisations but generally showing a stronger presence of traditional academic and vocational subjects.

4.4 Data Collection

Given the exploratory nature of the study, **semi-structured qualitative interviews** were selected as the primary data collection method. According to Creswell (2013), qualitative interviews are particularly suitable when the goal is to understand participants' experiences, perceptions, and meaning-making processes within their real-life contexts. This approach aligns with the study's aim to examine how Slovak VET teachers interpret the role of AI in their work, what motivates or constrains their adoption of AI tools, and how these experiences differ between AI pioneers and non-pioneers.

The interview protocol was jointly developed within the VETAssist project and structured into four thematic sections:

- sociodemographic background;

- AI adoption, motivation, and challenges;
- practical use of AI in teaching and administration; and
- future perspectives on AI integration.

Interviews were conducted individually, either online or in person, depending on participant availability. Each interview lasted approximately 30–45 minutes. The semi-structured format ensured comparability across participants while allowing flexibility for follow-up questions and deeper exploration of relevant issues. All participants provided informed consent prior to the interview and were assured confidentiality and voluntary participation.

4.5 Ethical Considerations

The study adhered to the ethical guidelines of the VETAssIst project and the University of Ss. Cyril and Methodius in Trnava. No personal data were collected, and participants were assured of anonymity and confidentiality. Interviews were conducted only after obtaining explicit consent, as documented in the interview introduction. All data were stored securely and used exclusively for research purposes.

4.6 Data Analysis

All ten interviews, five with AI pioneers and five with non-pioneers, were analysed using reflexive thematic analysis (Braun & Clarke, 2006). The transcripts from both groups were reviewed repeatedly to ensure familiarisation, including the pioneer interviews from Prešov, Žilina, Nitra and Košice and the non-pioneer interviews from Nitra, Prešov, Trenčín and Košice. Initial codes were generated inductively and focused on recurring ideas such as teachers' motivations, perceived benefits of AI, barriers to adoption, ethical concerns, school-level conditions, and expectations for professional development. These codes were then grouped into broader thematic categories, which were compared across both teacher groups to identify convergences and differences. Themes were subsequently refined to ensure internal coherence and clear relevance to the research questions.

The final themes serve as the basis for presenting the findings in the next chapter, with explicit comparison between pioneers and non-pioneers.

5 Results

This section presents a thematic analysis of qualitative data gathered through semi-structured interviews conducted with Slovak vocational education and training (VET) teachers participating in the Erasmus+ VETAssIst project (Project No. 2024-1-HU01-KA220-VET-000253387). The interviews aimed to explore current practices, motivations, challenges, and contextual conditions shaping the integration of artificial intelligence (AI) in VET. The sample

comprises two contrasting teacher profiles: AI pioneers, who actively experiment with AI tools, and non-pioneers, who demonstrate limited or hesitant engagement with AI.

5.1 Motivations for Engaging with AI

A clear divergence emerged between the two groups.

AI pioneers frequently described their motivation as rooted in professional curiosity, intrinsic interest in innovation, and the desire to streamline everyday tasks. Many highlighted a personal commitment to "keeping up with technology" and improving workflow efficiency. Their initial engagement with AI stemmed from informal experimentation, peer exchange, or participation in training opportunities.

In contrast, **non-pioneers** expressed a more distant interest in AI, typically influenced by media, colleagues, or general social discourse rather than active professional motivation. Their interviews reflected uncertainty, lack of confidence, and limited knowledge, which impeded further exploration despite a generally positive attitude toward technological progress.

5.2 Types of Tools and Extent of Use

The difference in AI adoption translated directly into tool usage.

Pioneers reported frequent use of generative chatbots (ChatGPT, Copilot, Perplexity), visual design tools (Canva, Adobe Firefly), and specialised educational platforms (Diffit, Curipod, Quizizz). They described using AI to create lesson plans, worksheets, exam materials, programming explanations, or project-based tasks. Some ICT teachers also used AI to support debugging or code explanation.

Non-pioneers demonstrated minimal use of AI beyond basic functionalities embedded in standard software (Microsoft 365, translation tools). When AI was used, it typically served simple tasks such as searching for information, summarising text, or generating images. Most non-pioneers emphasised that they do not feel sufficiently competent to integrate AI into teaching activities.

5.3 Pedagogical Applications and Classroom Practices

Among pioneers, AI was integrated into multiple dimensions of teaching practice. Teachers reported using AI for:

- generating differentiated materials for students with varying abilities,
- creating visual resources (diagrams, posters, illustrated explanations),
- developing quizzes and formative assessments,
- supporting project-based learning,
- preparing templates, rubrics, and administrative documents.

Some pioneers also experimented with student-facing activities, such as guided prompting, creative tasks, or demonstrations of AI-generated solutions, always accompanied by discussions of verification and reliability.

Among non-pioneers, pedagogical use remained sporadic. Teachers described limited experimentation and stated that they would require greater confidence and training before involving students in AI-supported tasks. Their classroom references to AI were mostly conceptual rather than procedural.

5.4 Perceived Outcomes and Added Value

Pioneers consistently emphasised the **time-saving** dimension of AI, explaining that AI "reduces preparation workload" and "quickly produces materials that would otherwise take hours." They also highlighted improved quality of learning resources and increased creativity in lesson design. Some pioneers observed greater student motivation when AI-supported visuals or interactive tasks were incorporated.

Non-pioneers acknowledged the theoretical advantages of AI but lacked concrete experiences to evaluate its value. Their expectations centred on potential time savings or new approaches to content delivery, yet these benefits remained mostly unrealised in practice.

5.5 Barriers to AI Adoption

Barriers differed substantially between the two groups.

Pioneers reported:

- the financial limitations of premium tools,
- uneven technical infrastructure,
- varying quality of Slovak-language output,
- the need to verify AI-generated information,
- lack of systematic training in advanced AI use.

Non-pioneers, however, described more fundamental obstacles:

- insufficient training and lack of step-by-step guidance,
- uncertainty about how to begin using AI,
- fear of misusing the technology or giving students incorrect information,
- concerns about plagiarism and students' over-reliance on automation,
- inadequate digital infrastructure in some schools.

Several non-pioneers noted that rapidly evolving technologies make it "difficult to keep up," reinforcing their reluctance to adopt AI independently.

5.6 Institutional and Environmental Factors

The organisational context played a significant role in shaping teacher engagement with AI.

Pioneers frequently worked in environments that encouraged innovation or where digital technologies were well integrated into school culture. Some had colleagues who experimented with AI, creating informal support networks.

Non-pioneers tended to come from schools where digitalisation was inconsistent or where professional development opportunities were limited. They expressed a need for clear school-level strategies, more structured training, and leadership support before they would feel comfortable integrating AI into their teaching practice.

5.7 Ethical and Pedagogical Concerns

Ethical considerations appeared in both groups but were interpreted differently.

Pioneers showed an awareness of data privacy, academic integrity, and the need for verification of outputs. They tended to address these issues proactively, encouraging students to engage critically with AI content and emphasising responsible use.

Non-pioneers expressed stronger apprehensions. They feared that AI could reduce students' critical thinking, increase dependency, and facilitate plagiarism. Many stated that they lacked the competence to guide students in ethical use and therefore avoided AI altogether.

6 Discussion

The findings show a clear divide between Slovak VET teachers who actively use AI and those who do not. AI pioneers approached the technology with curiosity, confidence, and a desire to improve efficiency, which aligns with international research highlighting self-efficacy and openness to innovation as key drivers of early adoption. They used AI regularly for lesson planning, material creation, and administrative tasks, and reported benefits such as time savings and increased creativity. Non-pioneers, however, expressed interest in AI only at a general level and lacked the training or confidence needed for practical implementation. Their concerns, particularly about plagiarism, misinformation, and student dependency, reflect global debates on the risks of AI in education. The interviews also showed that school context plays an important role: pioneers often worked in digitally supportive environments, while non-pioneers described insufficient infrastructure and unclear institutional strategies. Both groups expressed a need for professional development, but at different levels of complexity. Overall, the results suggest that although Slovak VET teachers recognise the potential of AI, its integration remains uneven and depends on the interplay of teacher readiness, school conditions, and access to structured, practical training.

7 Recommendations

The findings indicate the need for differentiated professional development that recognises the varying levels of teacher readiness. Non-pioneers would benefit from introductory, practice-oriented training that allows them to experiment with AI tools in a guided and supportive environment, while pioneers require more advanced and subject-specific opportunities to deepen their expertise. Strengthening institutional support is equally important; schools should develop clear strategies for the pedagogical and ethical use of AI and create conditions that encourage experimentation and collaboration. Improving digital infrastructure would further help address disparities between schools and ensure that teachers can access and use AI tools effectively. Finally, both teachers and students should be supported in developing responsible and critical approaches to AI, with an emphasis on verifying information, understanding limitations, and engaging with AI outputs thoughtfully and ethically.

8 Limitations

This study is based on a small sample of ten Slovak VET teachers, which limits the generalisability of the findings. The data reflect self-reported experiences that may not capture the full complexity of classroom practice. Additionally, the rapidly evolving nature of AI means that teachers' perceptions and available tools may change quickly. Future research should include larger samples, quantitative components, and longitudinal perspectives to better understand how AI integration develops over time.

9 Conclusion

This study set out to explore three core questions: how Slovak VET teachers perceive the opportunities and challenges of using artificial intelligence in their teaching; which factors motivate or hinder the adoption of AI tools; and how the experiences of AI pioneers differ from those of non-pioneers. The findings show that while teachers generally recognise the potential benefits of AI, their readiness to use it varies considerably. Pioneers, driven by curiosity, digital confidence and supportive school environments, integrate AI into lesson planning, content creation and everyday tasks, reporting clear advantages such as time savings and improved material quality. Non-pioneers, on the other hand, face fundamental barriers including limited training, low confidence and concerns about ethical and pedagogical risks, which prevent them from moving beyond initial awareness. These differences confirm that successful AI integration in Slovak VET depends not only on individual motivation but also on access to appropriate training and supportive institutional conditions. Strengthening these

areas will be essential for ensuring that AI becomes a meaningful and responsibly used component of vocational education.

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