



STIAEM

Slow Tech Innovation

AI, Ethics and
New Teaching Methods

NATIONAL REPORT LITHUANIA



Università di Foggia
Studi Umanistici, Lettere, Beni Culturali,
Scienze della Formazione



İSTANBUL - ESENLER
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1474



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Preface

This volume offers the first systematic, empirically grounded, and large-scale mapping of Artificial Intelligence within the Lithuanian school context developed under the Erasmus+ STIAEM project (Slow Tech Innovation: AI, Ethics, and New Teaching Methods - 2025-1-IT02-KA220-SCH-000365213). This National Report constitutes a scientific and strategic deliverable developed under Action 2 of Work Package 2 (WP2) of the international consortium. Through a computational and psychometric survey conducted among 139 students and 41 teachers from Panevėžys “Vyturys” Progymnasium, this research directly responds to the priorities of the European Commission’s Digital Education Action Plan (2021–2027), contributing to the development of evidence-based knowledge on the opportunities, risks, and ethical implications of Artificial Intelligence in education. While rooted in the Lithuanian educational context, the report also contributes to the broader comparative framework of the STIAEM project, providing valuable insights into how AI is perceived, adopted, and governed within schools.

The epistemological horizon guiding the entire architecture of this research breaks with technological determinism and with narratives that reduce educational innovation to efficiency, acceleration, or technological performance. The conceptual framework of the report is firmly anchored in the Slow Tech paradigm and the human-in-the-loop pedagogical approach, which promote a reflective, critical, and ethically sustainable integration of technology centred on human agency. The primary objective is to challenge the assumption that AI Literacy can be reduced to technical proficiency in the use of commercial generative software. Instead, literacy is conceptualised as a multidimensional competence encompassing affective, cognitive, behavioural, and ethical dimensions, understood as a fundamental prerequisite for active, democratic, and responsible digital citizenship capable of engaging with emerging technologies without passively surrendering to automation or algorithmic decision-making.

On a methodological level, the rigor of the work is guaranteed by an integrated approach that combines the precision of quantitative analysis with the depth of qualitative inquiry. The research moves beyond the simple description of percentages and averages by employing advanced statistical techniques to identify patterns, relationships, and predictors associated with AI literacy, digital literacy, and ethical awareness. This quantitative framework is complemented by qualitative evidence collected through focus groups and interviews, allowing statistical findings to be interpreted through the lived experiences, concerns, expectations, and educational realities of Lithuanian teachers and students. In this way, numerical data become not merely indicators of technological adoption but instruments for understanding the cultural and pedagogical transformations associated with the emergence of Artificial Intelligence in schools.

To move beyond declarative attitudes and explore actual ethical reasoning, the project incorporates Situational Judgment Tests (SJTs). Participants were presented with realistic educational dilemmas and forced-choice scenarios designed around three major international challenges that currently shape debates on AI and education.

Autonomy in the face of automation. This dimension examines the risk of excessive reliance on technology. On the student side, it assesses the capacity to critically evaluate AI-generated information, identify inaccuracies, and resist the temptation to delegate cognitive effort to automated systems. On the teacher side, it investigates concerns related to the delegation of pedagogical tasks to AI and the potential impact of automation on professional autonomy, instructional planning, and educational judgement.

The educational relationship and online privacy. This dimension explores the protection of personal data and the preservation of meaningful human interactions within increasingly digital learning environments. It investigates students’ attitudes towards privacy and data sharing, as well as teachers’ willingness to maintain the human dimension of education in contexts where intelligent systems increasingly mediate communication, feedback, and learning support.

Civic and ecological responsibility. This area measures awareness of the social, environmental, and ethical consequences of technological development. It examines students’ sensitivity to issues such as electronic waste, sustainability, and the ecological footprint of AI systems, while also exploring teachers’ attitudes towards emerging educational practices such as AI-assisted writing, automated feedback, and inclusive assessment.

The results emerging from this national mapping reveal a context characterised by both opportunity and challenge. On the one hand, Lithuanian teachers demonstrate relatively high levels of digital

literacy and a generally positive orientation towards educational technology. More than half of the participating teachers report regularly using digital technologies in their teaching practice, indicating that technology integration is already embedded in everyday educational activities. Similarly, Lithuanian students display widespread familiarity with Artificial Intelligence tools, with almost all respondents reporting some degree of AI use and the majority employing such technologies for translations, brainstorming, idea generation, or homework support.

On the other hand, the findings reveal important pedagogical and ethical tensions. While students show positive attitudes towards AI and frequently perceive it as a useful educational resource that enhances understanding and learning efficiency, ethical awareness and ethical decision-making emerge as comparatively weaker dimensions among both students and teachers. The data suggest that practical engagement with AI technologies often develops more rapidly than the capacity to critically reflect on their ethical implications. In this regard, schools face the challenge of moving beyond the mere availability of digital tools towards the development of structured educational pathways that explicitly address responsible, ethical, and reflective AI use.

The statistical analyses further challenge several assumptions frequently present in public discourse. Among students, age and gender appear to play a relatively limited role in explaining differences in AI literacy and ethical awareness. Instead, actual patterns of AI use emerge as the most influential factor associated with cognitive, affective, behavioural, and ethical dimensions of AI literacy. Students who engage more frequently with AI technologies tend to demonstrate higher levels of familiarity, confidence, and digital competence. However, increased use alone does not automatically guarantee stronger ethical reasoning, highlighting the importance of educational interventions that connect technological competence with ethical reflection.

Among teachers, AI competence emerges as a positive predictor of ethical decision-making, while AI anxiety is associated with lower levels of ethical engagement. These findings suggest that confidence and familiarity with AI technologies may foster more responsible and reflective forms of use, whereas uncertainty and apprehension may hinder teachers' ability to engage critically with the ethical challenges posed by AI. Notably, general digital literacy alone does not appear sufficient to explain variations in ethical decision-making, reinforcing the need for targeted professional development focused specifically on AI-related competencies and ethical issues.

Ultimately, this report seeks to provide reliable evidence and practical guidance for educators, school leaders, policymakers, and educational stakeholders navigating the challenges of digital transformation. Its findings align with the principles of transparency, accountability, human oversight, and risk awareness established by the European Artificial Intelligence Act (AI Act). Rather than advocating the uncritical adoption of technological solutions, the report offers a methodological compass for integrating Artificial Intelligence into educational settings in ways that strengthen pedagogical quality, ethical responsibility, and human development.

The evidence gathered throughout these pages rejects the vision of education as a domain subordinated to the commercial logic of technological acceleration and instead reaffirms the necessity of a human-centred, ethically governed, and socially responsible approach to innovation. In this light, the data presented in this report should not be understood as a final destination but as a foundation for future action. They provide the empirical basis upon which the STIAEM project will design educational materials, teacher training activities, and pedagogical interventions aimed at fostering a sustainable, replicable, and ethically robust model of Artificial Intelligence integration in Lithuanian schools.

1. Introduction and Methodology

1.1 Objectives of the National Report

The STIAEM project aims to strengthen teachers' digital, methodological, and pedagogical competences, promoting the ethical, critical, and informed integration of Artificial Intelligence and emerging technologies in educational settings. Within this framework, the Lithuanian National Report seeks to provide an evidence-based understanding of how digitalisation and AI are currently perceived and used by teachers and students in the national educational context. The main objectives of this report are: (1) to examine the current state of AI and digital technology use in Lithuanian schools; (2) to assess levels of AI literacy, digital literacy, and ethical awareness among teachers and students; (3) to explore attitudes towards AI and its role in teaching and learning processes; and (4) to identify opportunities, challenges, and training needs associated with the responsible integration of AI in education. The report also aims to investigate the extent to which educational actors are prepared to engage critically with AI technologies while maintaining autonomy, ethical responsibility, and informed decision-making. The study is guided by the principles of the Slow Tech paradigm (Patrignani & Whitehouse, 2014) and the human-in-the-loop approach (Benanti, 2022), which advocate for a responsible and human-centred use of technology. From this perspective, digital transformation should not be understood merely as technological adoption, but as a process that requires critical thinking, ethical reflection, and the preservation of human agency. Particular attention is given to the ethical dimensions of AI use, including issues related to privacy, trust, autonomy, and responsible technology adoption. By analysing the Lithuanian data, the report aims to identify current trends, strengths, and areas for development in relation to AI integration in schools. The findings provide valuable insights for educators, school leaders, and policymakers while also contributing to the comparative European perspective of the STIAEM project. Ultimately, the evidence gathered through this research will support the development of future training activities, educational resources, and pedagogical models designed to foster ethical, sustainable, and effective uses of Artificial Intelligence in education.

1.2 Description of the Sample

The Lithuanian component of the STIAEM project was conducted at Panevėžys "Vyturys" Progymnasium and involved a total of 180 participants, comprising 139 students and 41 teachers. Although more limited in size than some of the other national samples within the project, the dataset provides a valuable snapshot of how Artificial Intelligence, digital technologies, and ethical issues are perceived and experienced within the Lithuanian educational context. To ensure methodological clarity and facilitate comparative analyses, the collected demographic information has been organised into two principal groups corresponding to the student and teacher cohorts. The following sections present the main demographic characteristics of both groups, including gender, age, educational level, professional experience, and other relevant background variables. The following figures provide an initial visual overview of the main demographic and background characteristics of the Spanish teacher sample, including the educational levels taught and participants' relationship with technology. These descriptive results offer a preliminary understanding of the profile of the respondents and the context in which AI-related perceptions and practices are situated. However, a more detailed presentation and analysis of the quantitative findings, including frequencies, inferential statistics, and relationships between variables, will be provided later in Section 3. Data Standardization and Quantitative Analysis.

Figure 1. Gender distribution of the Lithuanian teachers' sample (N=41)

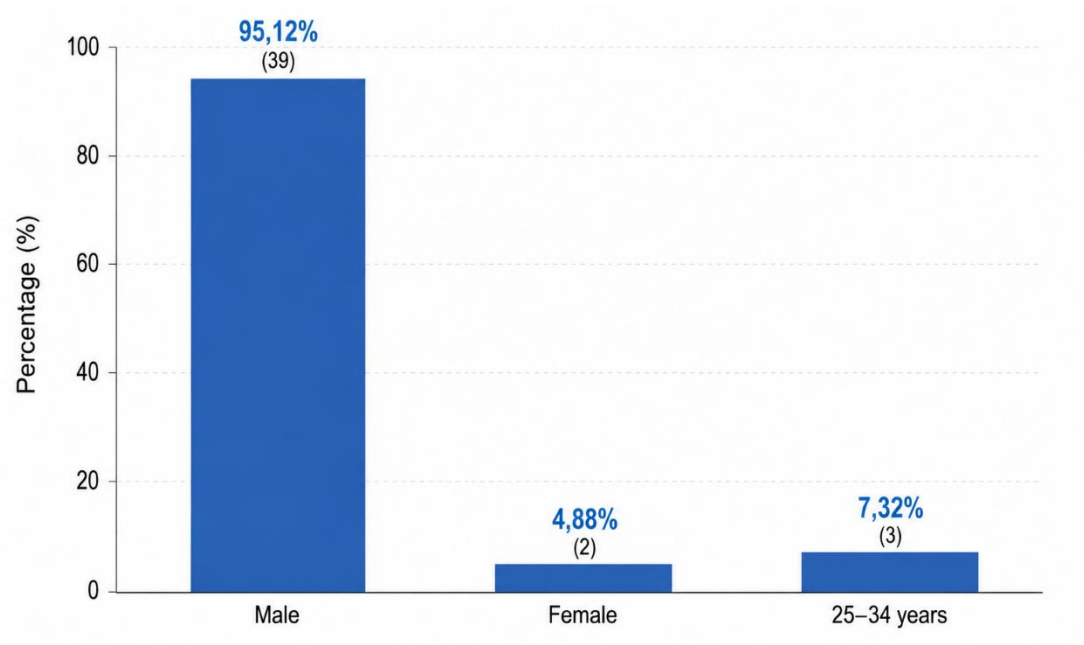


Figure 2. Age distribution of the Lithuanian teachers' sample (N=41)

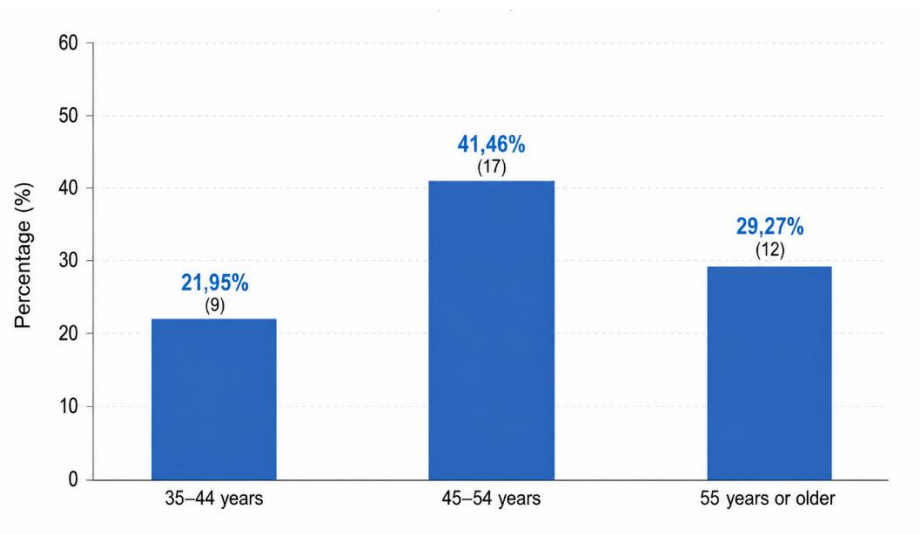
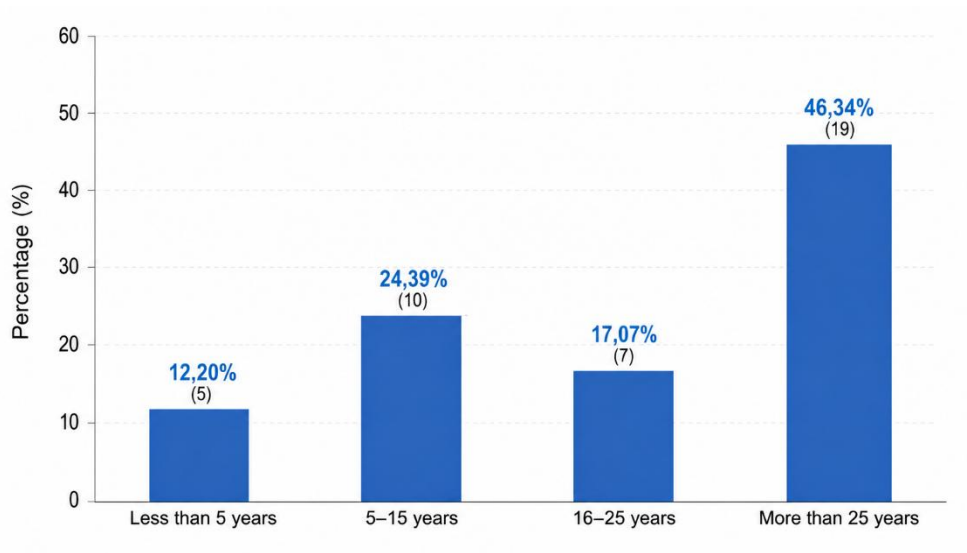


Figure 3. Teaching experience of the Lithuanian teachers' sample (N= 41)



Figures 4 and 5. Educational profile and relationship with technology among Lithuanian teachers

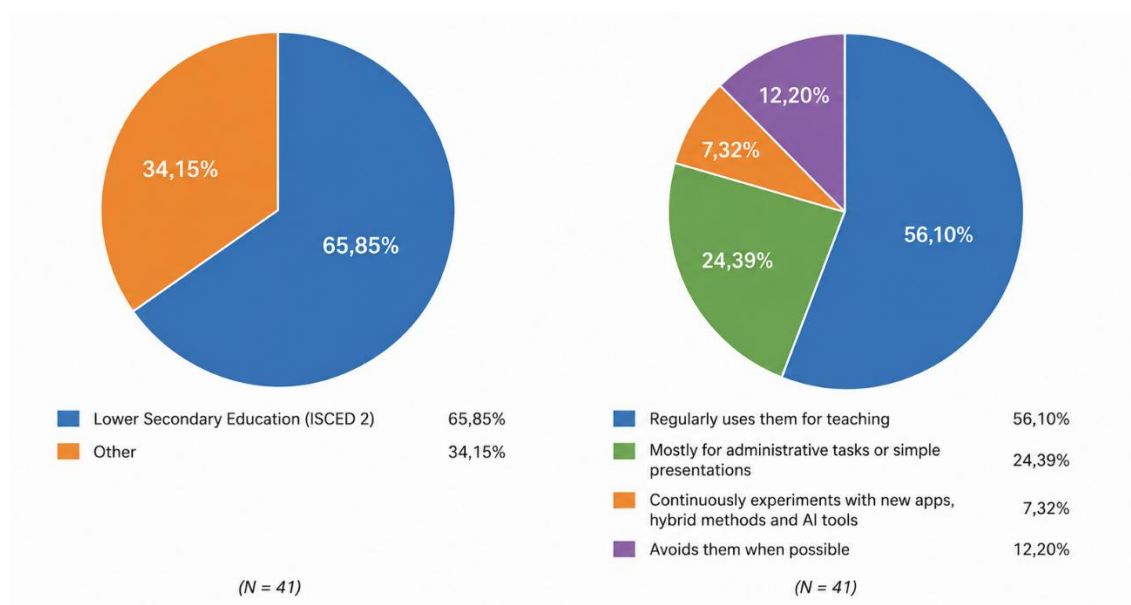


Figure 6. Gender distribution of the Lithuanian students' sample (N=139)

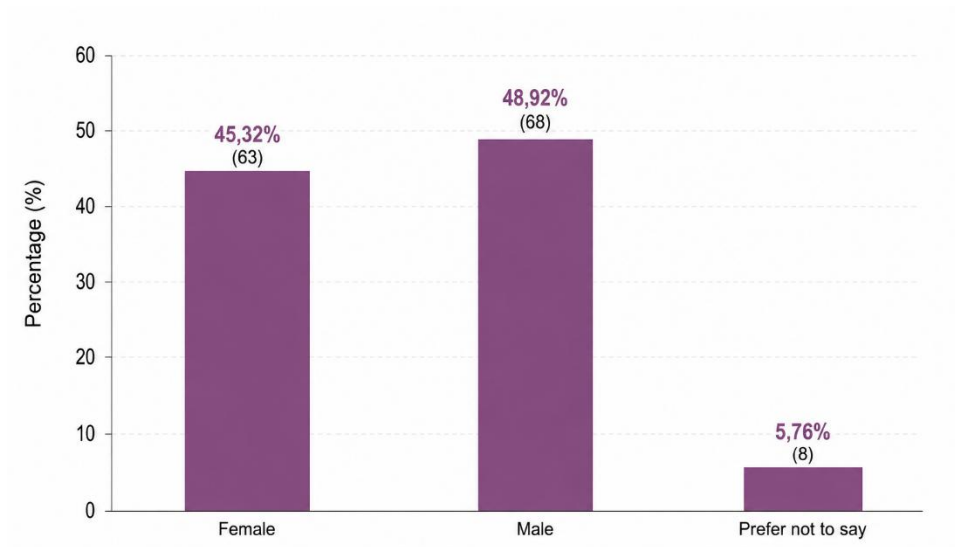
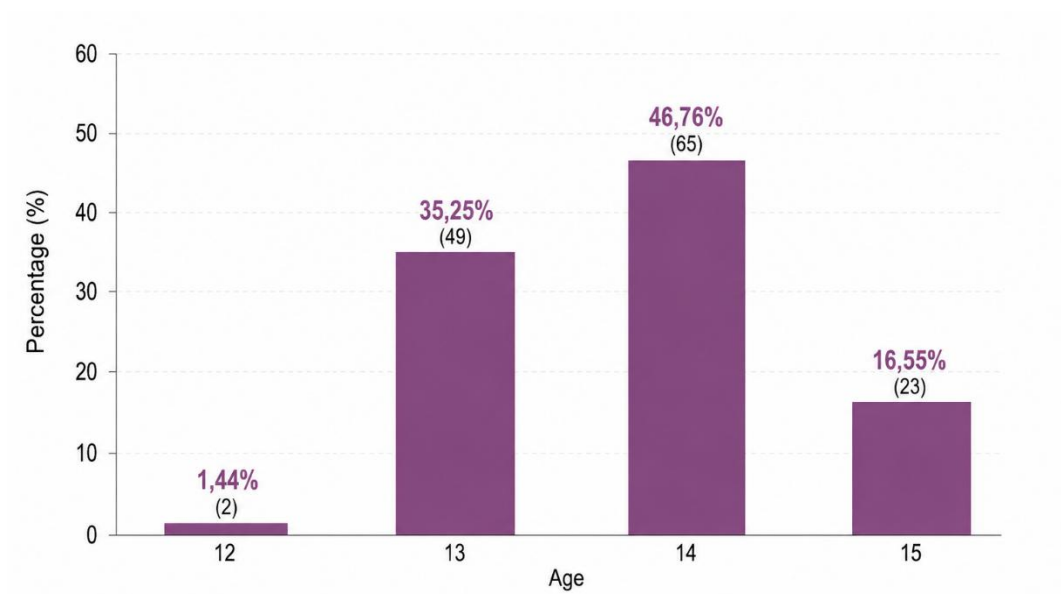


Figure 7. Age distribution of the Lithuanian students' sample (N=139)



Figures 8 and 9. AI use and relationship with technology among Lithuanian students

Figure 8. AI use among the Lithuanian students' sample

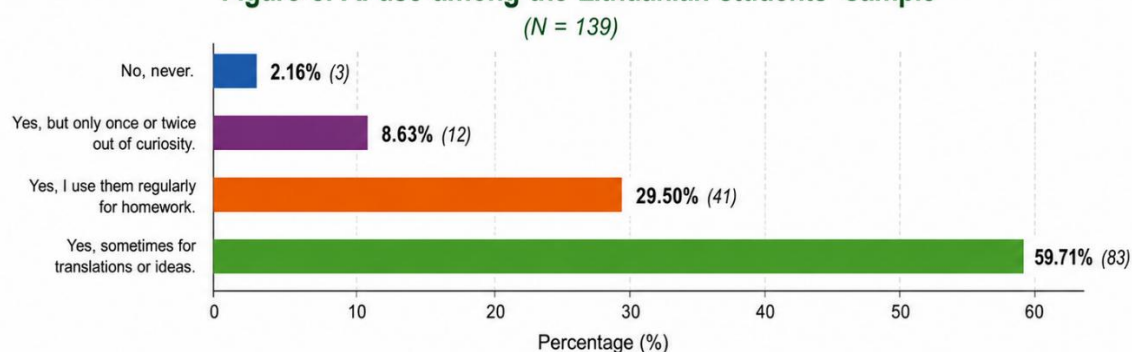
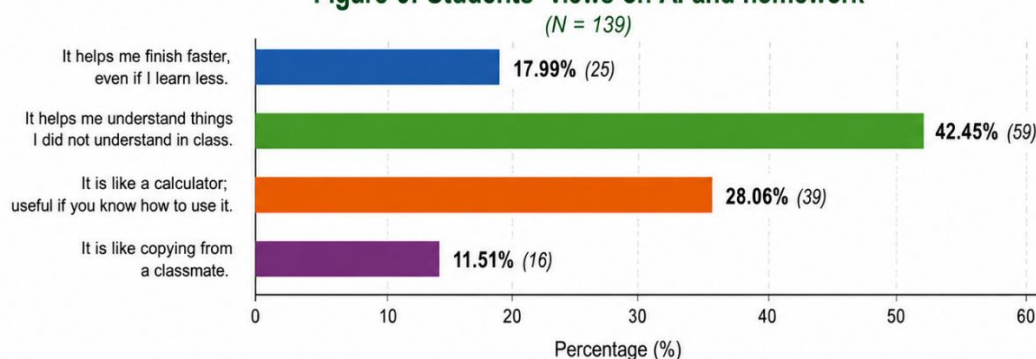


Figure 9. Students' views on AI and homework



1.3 Data Collection Tools (Surveys, semi-structured interview protocols)

The Surveys and semi- structured interview protocols were translated to Lithuanian language. The teachers and students had possibility to answer in their native language.

2. National Context of AI in Education

2.1 Current Policies, Regulations, and Ministerial Guidelines

National Policy on the Use of Artificial Intelligence (AI) in Education in Lithuania

Artificial intelligence (AI) is rapidly making its way into various areas of life, and education is one of the key sectors where it is receiving particular attention. Lithuania is developing a clear national policy to ensure that AI is used safely, responsibly, and meaningfully in the classroom. It is based not only on our country's decisions but also on the EU's (<https://www.consilium.europa.eu/lt/policies/artificial-intelligence-act/>), which strictly protects human rights, data, and security.

Position of the Ministry of Education, Science, and Sports

The Ministry of Education, Science, and Sports maintains a clear stance that the use of AI in education is inevitable and must be purposefully integrated into the educational process. They have developed guidelines for the use of AI (https://emokykla.lt/upload/media/public/EDTECH/Mokykla%20DI%20amz%CC%8Ciuje_bukletas_01-15.pdf) so that each school can establish its own rules. The Ministry emphasizes that AI should only be used in cases where it creates clear added value for teaching and learning. AI is considered a supportive tool that helps reduce routine tasks, differentiate instruction, and foster creativity; however, decisions regarding its use are always made by the teacher. An important emphasis by the Ministry is the responsible use of AI. This means that schools must ensure academic integrity, transparency (clearly indicating when AI was used), and

strict compliance with data protection requirements. It is prohibited to use AI tools that do not meet security standards.

What is happening now and what measures are already in place AI is already being actively used in education in Lithuania. Some teachers use AI tools in their work—both for lesson preparation and for assessing student work or developing educational content.

The following measures are being implemented at the national level:

- Schools have been provided with software licenses featuring integrated AI solutions (e.g., “Copilot Chat”), which are accessible to both students and teachers.
- Remote training sessions for educators on the application of AI in the educational process are being organized.
- The National Education Agency provides consultations to schools through the EdTech Center.

Each school develops AI policy guidelines in accordance with national guidelines. The key principles include transparency, ethics, critical thinking, and data protection. Rules for students and teachers are clearly defined. The key message is that AI cannot replace a person’s personal contribution to their work or be used fraudulently.

Involvement of Institutions and Organizations

The implementation of DI in education is carried out through collaboration among various institutions. The Ministry of Education, Science, and Sports, the National Education Agency (https://www.nsa.smsm.lt/wp-content/uploads/2025/10/DI_taikymas.pdf), the Ministry of Economy and Innovation (<https://eimin.lrv.lt/lt/veiklos-sritys/skaitmenine-politika/dirbtinis-intelektas/>), universities, associations of teachers and school administrators, organizations in the technology sector, and non-governmental initiatives.

Key players include:

- universities, which conduct research and develop didactics for AI applications;
- the Lithuanian Science Council, which funds projects related to the impact of AI on learning;
- the National Education Agency, which provides methodological and practical support;
- EdTech organizations, which develop tools and advise schools.

Innovative tools are also being developed, such as pilot AI platforms to monitor student learning progress or chatbots designed for inclusive education. <https://unicorns.lt/naujienos/nauja-edukacine-programa-pades-40-tukst-lietuvos-mokiniu-pazinti-dirbtini-intelekta> https://di-ma.lt/learnlab-platforma/?utm_source=chatgpt.com <https://editai.co/lt/> <https://eduten.com/>

Long-Term Outlook

Lithuania is transitioning from isolated initiatives to systematic AI development. National AI Strategic Guidelines for 2026–2035 are currently being drafted, which outline the long-term development of the AI ecosystem at the national level (<https://vssa.lrv.lt/lt/naujienos/nacionaliniu-dirbtinio-intelekto-strateginiu-gairiu-2026-2035-m-pristatymas-ir-aptarimas-RpN/>). One of the most important planned projects is the national AI competence and technology center “LitAI,” which is set to establish modern infrastructure (<https://inovacijuagentura.lt/news/2025/10/lietuva-laimejo-65-mln.-euru-es-konkursa---bus-steigiamas-pirmasis-dirbtinio-intelekto-centras-salyje.html?lang=lt>). This infrastructure will be accessible to institutions in the fields of science, education, business, and the public sector, thereby creating conditions for developing innovations and strengthening competencies.

In the long term, the goals are to ensure that:

- AI is integrated into educational content and teaching methods;
- learning becomes more personalized;
- teachers have clear competencies in the application of AI;
- Lithuania becomes a leading country in the application of AI technologies.

Summary

Lithuania’s national policy on the use of AI in education is being consistently developed and implemented. The Ministry’s position is clear: AI must be integrated responsibly, ensuring educational quality, data security,

and academic integrity. Specific measures are already in place to provide schools with technological tools, methodological support, and professional development for teachers. At the same time, a long-term strategic direction is being developed, focused on the transformation of the entire education system, in which AI becomes not only a technological innovation but also a key factor in improving the quality of education.

2.2 Digital Infrastructure and Technological Readiness of Experimental Schools

Panevezys “Vyturys” progymnasium have 2 computer classes (for 28 students). 15 laptops and 25 tablets.

3. Data Standardization and Quantitative Analysis

3.1 Data Pre-processing (Alignment with the Master Codebook, variable harmonization via ISCED)

3.1.1. Alignment with the Master Codebook

For both the teachers’ and students’ samples, the datasets were standardized in accordance with the Master Codebook. Variable names were reviewed to ensure they were suitable for quantitative analysis. Likewise, sociodemographic and educational variables were harmonized, incorporating references based on the ISCED classification.

3.1.2. Variable harmonization and scale preparation

For the teachers’ sample, the scales and composite variables were prepared following the framework proposed by Işık et al. (2024). Accordingly, the dimensions AI Competence, AI Anxiety, AI Usefulness, General Digital Literacy, and Ethical Decision Making were identified. In this process, item TCH_ANX_30 was reverse-coded prior to the analysis, and scenarios SD01–SD03 were recoded on a 0–3 scale for descriptive and inferential analyses.

As for the students’ sample, scale preparation followed the ABCE model proposed by Ng et al. (2024), resulting in a grouping of variables into the dimensions Affective, Behavioural, Cognitive, Ethical, Digital Literacy, and Ethical Awareness. As in the teachers’ sample, scenarios SD04–SD06 were transformed into ordinal variables with scores ranging from 0 to 3.

Table 1. Summary of data pre-processing steps

Sample	Step	Variables / dimensions
Teachers	Alignment with the Master Codebook	TP, TCH, DIG, SD variables
Teachers	Variable harmonization	Background variables

Teachers	Scale preparation	AI Competence, AI Anxiety, AI Usefulness, General Digital Literacy, Ethical Decision Making
Teachers	Reverse coding	TCH_ANX_30
Teachers	Scenario recoding	SD01–SD03
Students	Alignment with the Master Codebook	SP, AILQ, DIG, SD variables
Students	Variable harmonization	Background variables
Students	Scale preparation	Affective, Behavioural, Cognitive, Ethical, Digital Literacy, Ethical Awareness
Students	Scenario recoding	SD04–SD06

3.2 Descriptive Analysis (Frequencies, means, standard deviations for AI Literacy and Ethical Awareness)

3.2.1. Frequencies of the main background variables

Frequencies and percentages were calculated in both samples for the main background variables. In the case of the teachers' sample, the variables considered were gender, age, teaching experience, the educational level at which they teach, specialty, and relationship with technology. For the students' sample, gender, age, frequency of AI tool use, and perceptions of AI use in academic tasks were analysed.

Tables 2 and 3 present the results for teachers and students, respectively. The teachers' sample shows a predominance of women and a concentration of participants in the 45–54 age group. Most teachers reported using technology regularly to support their teaching, and Humanities and Arts was the most represented specialty area. The students' sample also shows a slight female majority, as well as a notable presence of 15- and 18-year-old students. Most students reported using AI at least occasionally, mainly to obtain ideas, translations, or support with schoolwork.

Table 2. Main background characteristics of the Lithuanian teachers' sample

Variable	Category	n	%
Gender	Male	39	95,12
	Female	2	4,88
	25–34 years	3	7,32

Age group	35–44 years	9	21,95
	45–54 years	17	41,46
	55 years or older	12	29,27
Teaching experience	Less than 5 years	5	12,2
	5–15 years	10	24,39
	16–25 years	7	17,07
	More than 25 years	19	46,34
Education level taught	Lower Secondary Education (ISCED 2)	27	65,85
	Other	14	34,15
Specialty	Humanities and Arts	16	39,02
	Other	10	24,39
	Special Education / Student Support	12	29,27
	STEM	3	7,32
Relation with technology	Avoids them when possible	5	12,2
	Continuously experiments with new apps, hybrid methods and AI tools	3	7,32
	Mostly for administrative tasks or simple presentations	10	24,39
	Regularly uses them for teaching	23	56,1

Table 2 presents the main background characteristics of the Lithuanian teacher sample (N = 41). The sample is overwhelmingly composed of male teachers (95.1%), with female participants representing only 4.9% of respondents. In terms of age, the largest group is between 45 and 54 years old (41.5%), followed by teachers aged 55 years or older (29.3%), indicating that the sample is predominantly made up of experienced and mature professionals. This pattern is further reflected in teaching experience, as nearly half of the respondents (46.3%) report more than 25 years of professional experience, while only 12.2% have been teaching for less than five years.

Regarding educational level, most participants teach in Lower Secondary Education (ISCED 2) (65.9%), suggesting that the findings mainly reflect the perspectives of teachers working with adolescents. The distribution of specialties shows a predominance of Humanities and Arts teachers (39.0%), followed by Special Education and Student Support professionals (29.3%), while STEM teachers account for a relatively small proportion of the sample (7.3%). This disciplinary composition should be considered when interpreting the results, as attitudes and practices related to technology may vary across subject areas.

Concerning the relationship with technology, the results reveal a generally positive orientation towards digital tools. More than half of the respondents (56.1%) report regularly using technology for teaching purposes, whereas only 12.2% state that they avoid technology whenever possible. Nevertheless, relatively few teachers (7.3%) describe themselves as active innovators who continuously experiment with new applications, hybrid methods, and AI tools. This suggests that, while technology has become integrated into everyday teaching practices for most participants, the adoption of more advanced or innovative digital approaches remains limited. Overall, the sample can be characterised as an experienced teaching workforce with moderate to high levels of technology use, providing a relevant context for examining teachers' perceptions and practices within the STIAEM project.

Table 3. Main background characteristics of the Lithuanian students' sample

Variable	Category	n	%
Gender	Female	63	45,32
	Male	68	48,92
	Prefer not to say	8	5,76
Age	12	2	1,44
	13	49	35,25
	14	65	46,76
	15	23	16,55
AI use	No, never.	3	2,16
	Yes, but only once or twice out of curiosity.	12	8,63
	Yes, I use them regularly for homework.	41	29,5
	Yes, sometimes for translations or ideas.	83	59,71

AI and homework	It helps me finish faster, even if I learn less.	25	17,99
	It helps me understand things I did not understand in class.	59	42,45
	It is like a calculator; useful if you know how to use it.	39	28,06
	It is like copying from a classmate.	16	11,51

Table 3 presents the main background characteristics of the Lithuanian student sample (N = 139). The gender distribution is relatively balanced, with male students representing 48.9% of the sample and female students 45.3%, while 5.8% preferred not to disclose their gender. In terms of age, the majority of respondents are 14 years old (46.8%), followed by 13-year-olds (35.3%). Students aged 15 account for 16.6% of the sample, whereas only a small proportion are 12 years old (1.4%). This age profile indicates that the findings primarily reflect the perspectives of students in the middle years of lower secondary education.

The results reveal a widespread familiarity with artificial intelligence tools among Lithuanian students. Nearly all respondents report some level of AI use, with only 2.2% indicating that they have never used such tools. The most common pattern of use is occasional engagement for translations, brainstorming, or generating ideas (59.7%), followed by regular use for homework-related tasks (29.5%). A smaller group (8.6%) report having experimented with AI only once or twice out of curiosity. These findings suggest that AI technologies have already become integrated into students' everyday learning practices, although their use is generally oriented towards support and assistance rather than intensive academic reliance.

Students' perceptions of AI in relation to homework are predominantly positive and pragmatic. The largest proportion of respondents (42.4%) believe that AI helps them understand concepts they did not fully grasp in class, highlighting its perceived educational value as a learning support tool. Furthermore, 28.1% compare AI to a calculator, viewing it as a useful resource when used appropriately. At the same time, 18.0% acknowledge that AI helps them complete tasks more quickly, even if it may reduce learning opportunities, while only 11.5% equate AI use with copying from a classmate. Overall, these results indicate that Lithuanian students tend to perceive AI as a legitimate educational aid that can enhance understanding and efficiency, rather than as a form of academic dishonesty.

3.2.2. Means and standard deviations for AI Literacy and Ethical Awareness

Means and standard deviations were calculated for the main dimensions in both the teachers' and students' samples. In the teachers' sample, the descriptive statistics were organized around the dimensions of AI Competence, AI Anxiety, AI Usefulness, Digital Literacy, and Ethical Decision Making. In the students' sample, the dimensions considered were Affective, Behavioural, Cognitive, Ethical, Digital Literacy, and Ethical Awareness.

Table 4. Means and standard deviations for AI literacy and ethical awareness dimensions

Sample	Dimension	n	Mean	SD
Teachers	AI Competence	41	2,94	0,85
	AI Anxiety	41	2,76	0,75
	AI Usefulness	41	2,86	0,78
	Digital Literacy	41	3,33	0,71
	Ethical Decision Making	41	1,76	0,67
Students	Affective	139	3,05	0,84
	Behavioural	139	2,45	0,85
	Cognitive	139	3,16	0,75
	Ethical	139	3,65	0,82
	Digital Literacy	139	3,48	0,67
	Ethical Awareness	139	1,78	0,73

Table 4 presents the mean scores and standard deviations for the dimensions related to AI literacy, digital literacy, and ethical awareness among Lithuanian teachers and students. Among teachers, the highest mean score is observed for Digital Literacy ($M = 3.33$, $SD = 0.71$), indicating a relatively strong perception of their digital skills and confidence in using digital technologies. Moderate scores are reported for AI Competence ($M = 2.94$, $SD = 0.85$) and AI Usefulness ($M = 2.86$, $SD = 0.78$), suggesting that teachers generally feel capable of engaging with AI technologies and recognize their potential value in educational contexts. AI Anxiety ($M = 2.76$, $SD = 0.75$) also reaches a moderate level, indicating that some concerns or uncertainties about AI remain present among participants. In contrast, Ethical Decision Making records the lowest mean score ($M = 1.76$, $SD = 0.67$), pointing to comparatively limited confidence or engagement with ethical aspects related to AI use.

For students, the highest score is found in the Ethical dimension ($M = 3.65$, $SD = 0.82$), followed by Digital Literacy ($M = 3.48$, $SD = 0.67$). These results suggest that students generally demonstrate a strong awareness of ethical considerations and perceive themselves as competent users of digital technologies. The Cognitive ($M = 3.16$, $SD = 0.75$) and Affective ($M = 3.05$, $SD = 0.84$) dimensions also show relatively positive levels, indicating a satisfactory understanding of AI-related concepts and generally favourable attitudes towards AI. By contrast, the Behavioural dimension obtains a lower mean score ($M = 2.45$, $SD = 0.85$), suggesting that students' actual engagement in AI-related practices may be less developed than their knowledge or attitudes.

A comparison between teachers and students reveals some notable patterns. Both groups report relatively high levels of digital literacy, highlighting a favourable context for the integration of AI technologies in educational settings. Students tend to demonstrate stronger scores in cognitive,

affective, and ethical dimensions than teachers do in AI-specific competence-related dimensions, reflecting their greater familiarity with AI as part of their everyday digital environment. However, both teachers and students report similarly low scores in Ethical Decision Making/Ethical Awareness (teachers: $M = 1.76$; students: $M = 1.78$), suggesting that the practical application of ethical principles when using AI remains an area requiring further development. Overall, the findings indicate a generally positive foundation for AI literacy within the Lithuanian sample, while also highlighting the need for targeted educational initiatives that strengthen ethical reasoning and responsible AI use.

3.3 Comparative and Correlational Analysis (ANOVA, T-test, Pearson/Regression models)

3.3.1. Pearson correlations

Pearson correlations were calculated to examine the relationship between the main AI literacy dimensions and the ethical outcome variables in both samples. In the teachers' sample, the associations between AI Competence, AI Anxiety, AI Usefulness, and Digital Literacy and Ethical Decision Making were analysed. In the students' sample, the relationships between the Affective, Behavioural, Cognitive, Ethical, and Digital Literacy dimensions and Ethical Awareness were examined.

Table 5. Pearson correlations between the main dimensions and the ethical outcome variables

Sample	Outcome variable	Predictor	r	p
Teachers	Ethical Decision Making	AI Competence	0,41	0.008
		AI Anxiety	-0,56	<.001
		AI Usefulness	0,27	0.093
		Digital Literacy	0,03	0.831
Students	Ethical Awareness	Affective	-0,26	0.002
		Behavioural	-0,31	<.001
		Cognitive	-0,27	0.001
		Ethical	0,05	0.545
		Digital Literacy	-0,06	0.473

3.3.2. Multiple linear regression models

Multiple linear regression models were estimated to examine the extent to which the main AI literacy dimensions predicted the ethical outcome variables in both samples. In the teachers' sample, the dependent variable was Ethical Decision Making, whereas in the students' sample the outcome variable was Ethical Awareness.

Table 6. Multiple linear regression models

Sample	Outcome variable	Predictor	B	SE	t	p
Teachers	Ethical Decision Making	AI Competence	0,371	0,167	2,219	0.033
		AI Anxiety	-0,531	0,155	-3,433	0.002
		AI Usefulness	-0,354	0,174	-2,039	0.049
		Digital Literacy	-0,112	0,152	-0,739	0.465
Students	Ethical Awareness	Affective	-0,073	0,127	-0,576	0.565
		Behavioural	-0,104	0,118	-0,878	0.382
		Cognitive	-0,239	0,124	-1,926	0.056
		Ethical	0,219	0,104	2,096	0.038
		Digital Literacy	-0,023	0,134	-0,174	0.862

Table 6 presents the results of the multiple linear regression analyses examining the predictors of Ethical Decision Making among teachers and Ethical Awareness among students in the Lithuanian sample. For teachers, the model identifies several significant relationships between AI-related dimensions and ethical decision-making. AI Competence emerges as a positive predictor ($B = 0.371$, $p = .033$), indicating that teachers who perceive themselves as more competent in using AI technologies are also more likely to demonstrate stronger ethical decision-making. This finding suggests that greater familiarity and confidence with AI may facilitate a more critical and responsible approach to its use in educational contexts.

In contrast, AI Anxiety is negatively associated with Ethical Decision Making ($B = -0.531$, $p = .002$), representing the strongest predictor in the model. Teachers who experience higher levels of anxiety regarding AI tend to report lower levels of ethical decision-making. Similarly, AI Usefulness shows a small but statistically significant negative relationship with the outcome variable ($B = -0.354$, $p = .049$). Although somewhat unexpected, this result may indicate that perceiving AI primarily as a useful tool does not necessarily translate into greater ethical reflection and could even be associated with a more instrumental approach to technology use. Digital Literacy does not significantly predict Ethical Decision Making ($p = .465$), suggesting that general digital skills alone are insufficient to explain variations in ethical decision-making related to AI.

For students, the regression analysis reveals a more limited set of significant predictors of Ethical Awareness. Among the dimensions examined, only the Ethical dimension shows a statistically significant positive effect ($B = 0.219$, $p = .038$), indicating that students who report stronger ethical attitudes and values related to AI are more likely to demonstrate higher levels of ethical awareness. This result highlights the importance of ethical dispositions as a key factor in shaping students' understanding of responsible AI use.

The remaining predictors do not reach conventional levels of statistical significance. Affective ($p = .565$), Behavioural ($p = .382$), and Digital Literacy ($p = .862$) dimensions show no meaningful association with Ethical Awareness. The Cognitive dimension approaches significance ($B = -0.239$, $p = .056$), suggesting a possible relationship between AI-related knowledge and ethical awareness that may warrant further investigation in larger samples. Overall, the findings indicate that ethical outcomes are influenced less by general digital literacy and more by AI-specific competencies and ethical orientations. These results underline the importance of incorporating explicit ethical training and reflection into AI education initiatives for both teachers and students within the STIAEM project.

3.3.3. Group comparisons: t-test and ANOVA

Group comparison tests were conducted using t-tests and ANOVA in order to explore possible differences in the main dimensions according to background variables. In the teachers' sample, the t-test was applied by gender, while ANOVA was conducted according to age, teaching experience, educational level, and specialty. In the students' sample, the t-test was used for gender comparisons, whereas ANOVA was performed according to age, frequency of AI use, and perceptions of AI use in schoolwork.

In the teachers' sample, no statistically significant differences were observed either in the gender comparisons or in the analyses of variance conducted for the remaining background variables. Consequently, the dimensions of AI Competence, AI Anxiety, AI Usefulness, Digital Literacy, and Ethical Decision Making showed a relatively homogeneous pattern across the different groups considered.

Table 7. Summary of significant group comparisons in the students' samples

Grouping variable	Dependent variable	Test	Statistic	p
Gender	Affective	t-test	-1,921	0.057
Gender	Behavioural	t-test	-3,202	0.002
Gender	Cognitive	t-test	-1,589	0.115
Gender	Ethical	t-test	1,842	0.068
Gender	Digital Literacy	t-test	0,669	0.505
Gender	Ethical Awareness	t-test	0,77	0.442
Gender	Affective	t-test	-1,921	0.057
Age	Behavioural	ANOVA	0,241	0.868
Age	Cognitive	ANOVA	1,172	0.323
Age	Ethical	ANOVA	0,195	0.900
Age	Digital Literacy	ANOVA	0,125	0.945

Age	Ethical Awareness	ANOVA	0,275	0.844
AI Use	Affective	ANOVA	10,722	<.001
AI Use	Behavioural	ANOVA	5,442	0.001
AI Use	Cognitive	ANOVA	3,767	0.012
AI Use	Ethical	ANOVA	5,008	0.003
AI Use	Digital Literacy	ANOVA	6,144	<.001
AI Use	Ethical Awareness	ANOVA	4,068	0.008
AI Homework Opinion	Affective	ANOVA	5,515	0.001
AI Homework Opinion	Behavioural	ANOVA	2,608	0.054
AI Homework Opinion	Cognitive	ANOVA	1,841	0.143
AI Homework Opinion	Ethical	ANOVA	0,79	0.501
AI Homework Opinion	Digital Literacy	ANOVA	0,798	0.497
AI Homework Opinion	Ethical Awareness	ANOVA	2,427	0.068

Table 7 summarizes the results of the group comparison analyses conducted among Lithuanian students. Overall, the findings indicate that students' AI use patterns are more strongly associated with differences in AI literacy and ethical awareness dimensions than demographic characteristics such as gender or age. Regarding gender, a statistically significant difference was found only for the Behavioural dimension ($t = -3.202$, $p = .002$), suggesting that male and female students differ in the extent to which they engage in AI-related practices. No significant gender differences were observed for Cognitive, Digital Literacy, or Ethical Awareness dimensions. Although the results for the Affective ($p = .057$) and Ethical ($p = .068$) dimensions approached statistical significance, they did not meet the conventional threshold of $p < .05$. These findings suggest that gender plays a relatively limited role in shaping students' AI literacy and ethical awareness profiles. Age was not significantly associated with any of the dimensions examined. The ANOVA results indicate no meaningful differences across age groups in Behavioural, Cognitive, Ethical, Digital Literacy, or Ethical Awareness scores (all $p > .05$). This suggests that students within the sampled age range exhibit relatively similar levels of AI-related knowledge, attitudes, behaviours, and ethical awareness.

In contrast, AI use emerged as a highly relevant factor. Significant differences were found across all dimensions, including Affective ($F = 10.722$, $p < .001$), Behavioural ($F = 5.442$, $p = .001$), Cognitive ($F = 3.767$, $p = .012$), Ethical ($F = 5.008$, $p = .003$), Digital Literacy ($F = 6.144$, $p < .001$), and Ethical Awareness ($F = 4.068$, $p = .008$). These results indicate that students' frequency and type of AI use are closely related to their perceptions, knowledge, behaviours, and ethical understanding of AI. Students with greater experience using

AI tools are likely to display higher levels of AI literacy and ethical awareness, highlighting the importance of practical engagement with these technologies.

Students' opinions about AI use for homework also show some influence on the results. Significant differences were identified for the Affective dimension ($F = 5.515$, $p = .001$), indicating that students' attitudes towards AI vary according to how they perceive its role in homework and learning. Although the Behavioural dimension ($p = .054$) and Ethical Awareness ($p = .068$) approached significance, no statistically significant differences were found for Cognitive, Ethical, or Digital Literacy dimensions. This pattern suggests that students' beliefs about the educational value of AI may primarily affect their attitudes and perceptions rather than their knowledge or digital competencies. The findings demonstrate that direct experience with AI technologies is the most influential factor associated with differences in AI literacy and ethical awareness among Lithuanian students. Demographic variables such as gender and age appear to have a comparatively limited impact, whereas patterns of AI use and perceptions of AI in learning contexts play a more substantial role in shaping students' engagement with and understanding of artificial intelligence.

4. Qualitative Analysis and Dilemma Scenarios (SJT)

4.1 Thematic Analysis and Content Coding of Focus Groups/Interviews

The interviews were taken from teachers and students. 2 focus groups.

1 st focus group teachers- participated school headmaster, headmaster substitute and primary school teacher.

2 nd focus group students – participated 2 students from 7 th grade (14 years old) and 1 student – 8 th grade (15 years old).

4.2 Dilemma Scenarios Analysis

Teachers and students worrying that using of AI decrease critical thinking and increase addiction for using AI in every situation.

Both – teachers and students agreed that AI tools save time, give wider possibilities and ideas.

Teachers paid opinion to the ethics and standards for using AI, they should be clearly defined.

Both teachers and students said that we must think about safety and be careful with personal data.

4.3 Triangulation (Integration of qualitative results with quantitative trends)

At the current stage of the research, full triangulation between the qualitative findings and the quantitative results cannot yet be carried out due to the limited size of the qualitative sample. Since the qualitative phase has so far been developed as a pilot analysis, the available data are not sufficient to establish robust comparisons or identify consistent convergences and divergences between both methodological approaches. Therefore, a more comprehensive triangulation process will be done once the qualitative dataset has been expanded. A larger and more representative sample would allow for a more reliable integration of qualitative insights with the quantitative trends identified in the study, thereby strengthening the validity and interpretative depth of the National Report.

5. Case Studies

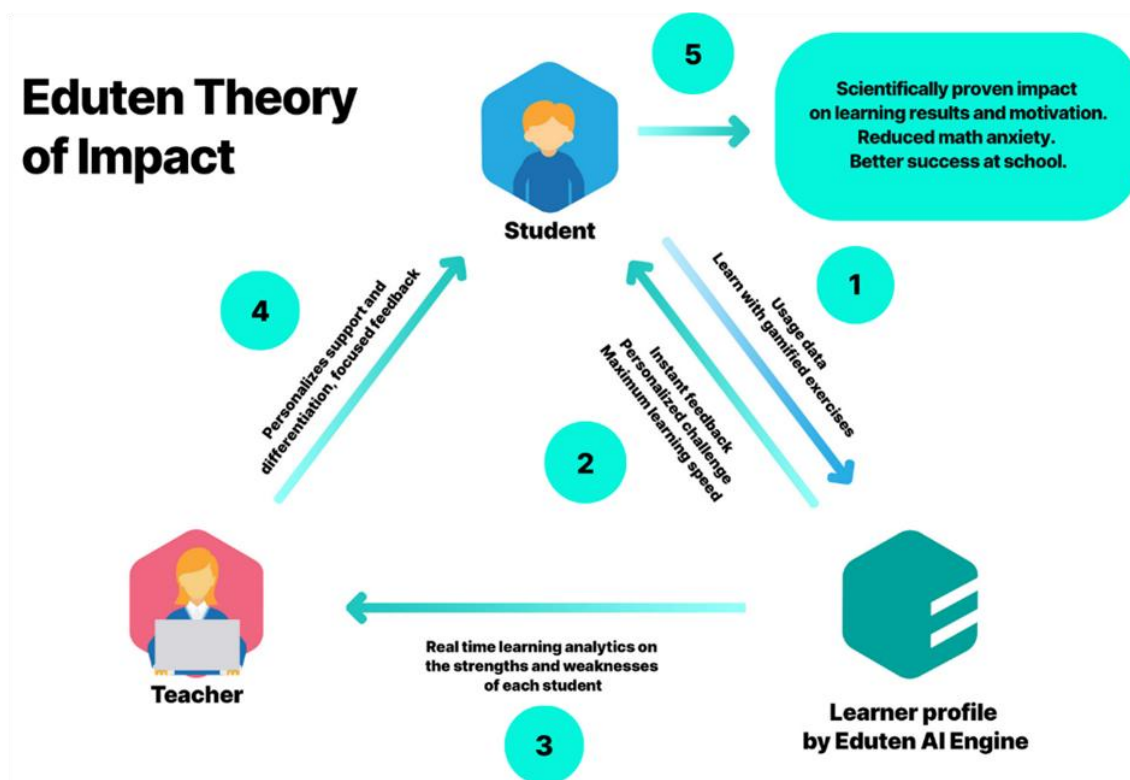
5.1 Selection and Description of 2-3 National Good Practices on AI Use

EDUTEN

Eduten is based on almost two decades of research and development at Turku Research Institute for Learning Analytics (TRILA), a unit of the University of Turku, Finland.

Eduten is one of the few truly research-based learning platforms in the world. Eduten Ltd. is a Finnish company that was established in 2017 to provide this platform internationally. To date, Eduten Ltd. has spread the Eduten platform to hundreds of thousands of teachers and students in more than 50 countries. Eduten Ltd. possesses deep expertise and experience in cooperating with education institutions and experts from other countries to adapt the Eduten platform for the schools in their countries.

What is the Eduten Platform?



Eduten Ltd. has deep experience in nationwide digital transformation projects that bring practical Finnish educational excellence to many nations and cultures. After working with education experts in more than 50 countries it is clear that while education systems main purpose is similar to all countries, there also are many differences.

EDUKA

Eduka class – is the most popular Lithuanian digital teaching and learning platform designed to facilitate, modernize and personalize the education process for primary and secondary education (grades 1-12).

Key features of EDUKA class include:

- Digital Textbooks and Materials: Access to over 60 digital textbook sets, including interactive tasks, infographics, presentations and audio/video materials.
- Automatic Grading: teachers can assign automatically corrected or differentiated tasks, divided according to different student abilities and learning levels.
- Differentiation: Features that allow teachers to assign tasks tailored to different student ability levels.
- Progress Tracking: Tools to analyze student progress and monitor results.
- Methodological Support: Resources for teachers, including teacher books, lesson plans and recommendations.
- Subject Coverage: Covers various subjects (Lithuanian language, History, Math, Science) for grades 1–12.

It is commonly integrated with the TAMO electronic diary system in Lithuania.

5.2 Analysis of Pedagogical Results and Student Engagement in the Presented Cases

44 perc of teachers and 50 perc. of students are capable to search for information online using advanced strategies (e.g., operators, filters) rather than just the first page of Google? How well can you manage privacy setting on social media and protect your sensitive data online? 44 perc. of teachers totally agree with the statement. 20 perc. disagree. 37 perc. In the middle.

To distinguishing fake news from real news and verifying the reliability of a source – 51 of teachers and 66 perc of students.

Only 19 perc. of teachers are capable to avoiding "technostress" and maintaining a healthy balance between online and offline life, 50 perc. Of students think that they can avoid "technostress".

6. Conclusions and Recommendations

6.1 Main Training Gaps and Identified Needs

The findings indicate that, despite teachers' generally positive attitudes towards technology and their regular use of digital tools, important training gaps remain. The greatest needs relate to the pedagogically effective integration of digital technologies, particularly AI-based tools, innovative teaching methodologies, and the development of digital competencies that support student-centred learning. Teachers also express a need for more practical, hands-on professional development that enables them to confidently apply these approaches in authentic classroom settings. Overall, the results suggest that future training initiatives within the STIAEM project should move beyond basic digital literacy and focus on strengthening teachers' capacity to integrate emerging technologies in pedagogically meaningful, ethical, and sustainable ways.

Overall, the findings indicate that AI has become a familiar and widely accepted component of students' learning practices. Most respondents use AI as a supportive educational resource, particularly for understanding difficult concepts, generating ideas, and completing academic tasks more efficiently. Although some students recognise the potential risk of overreliance on AI, relatively few associate its use with academic dishonesty. These results suggest that students generally adopt

a balanced and pragmatic view of AI, perceiving it as a tool that complements rather than replaces learning. Consequently, the findings highlight the importance of developing AI literacy and responsible use guidelines that help students maximise the educational benefits of AI while maintaining critical thinking, independent learning, and academic integrity.

A comparison between teachers and students reveals some notable patterns. Both groups report relatively high levels of digital literacy, highlighting a favourable context for the integration of AI technologies in educational settings. Students tend to demonstrate stronger scores in cognitive, affective, and ethical dimensions than teachers do in AI-specific competence-related dimensions, reflecting their greater familiarity with AI as part of their everyday digital environment. However, both teachers and students report similarly low scores in Ethical Decision Making/Ethical Awareness (teachers: $M = 1.76$; students: $M = 1.78$), suggesting that the practical application of ethical principles when using AI remains an area requiring further development. Overall, the findings indicate a generally positive foundation for AI literacy within the sample, while also highlighting the need for targeted educational initiatives that strengthen ethical reasoning and responsible AI use.

The findings demonstrate that ethical and responsible AI use depends primarily on AI-specific competencies and ethical dispositions rather than on general digital literacy alone. For teachers, AI competence positively supports ethical decision-making, while AI anxiety represents a substantial barrier, suggesting that confidence in using AI is essential for its responsible educational application. The negative association between perceived AI usefulness and ethical decision-making further indicates that viewing AI primarily as a tool for efficiency may reduce opportunities for critical ethical reflection.

Among students, ethical awareness is influenced mainly by their ethical values and attitudes towards AI, whereas cognitive knowledge, behavioural engagement, affective factors, and general digital literacy show limited predictive value. This highlights the importance of fostering ethical reasoning alongside technical AI skills, ensuring that students are equipped to evaluate AI critically and use it responsibly.

Overall, these findings suggest that future AI education should move beyond developing technical competence alone. The AI-based pedagogical model developed within the STIAEM project should integrate AI literacy, pedagogical innovation, and ethical education as complementary components of a comprehensive competence framework. Particular attention should be given to strengthening teachers' confidence in AI use, reducing AI-related anxiety, and embedding ethical reflection throughout teaching and learning activities. Such an approach will better prepare both teachers and students to engage with AI technologies in ways that are effective, critical, and ethically responsible.

The results also reveal gaps in digital safety and privacy competencies, particularly among teachers. While many educators report confidence in managing privacy settings and protecting personal data, a considerable proportion express uncertainty or lack confidence in these areas. Training should therefore include practical guidance on data protection, digital security, privacy management, and the responsible handling of information when using AI-supported technologies.

Another important training need concerns critical media and AI literacy. Although many respondents report being able to distinguish reliable information from misinformation, the findings suggest that these competencies should be further strengthened through systematic instruction in source evaluation, bias detection, fact-checking, and the critical assessment of AI-generated outputs. Developing these skills will support more informed and responsible use of AI in educational contexts.

The greatest training gap is evident in digital well-being. The low proportion of teachers who feel capable of managing technostress highlights the need for professional development that addresses sustainable technology use, workload management, healthy online–offline balance, and strategies for preventing digital fatigue. Supporting teachers' digital well-being is likely to enhance both their confidence in using AI and their capacity to integrate it effectively into teaching.

Overall, the findings indicate that future training within the STIAEM project should move beyond developing technical digital skills alone. Professional development should adopt a comprehensive approach that integrates advanced digital literacy, AI literacy, digital safety, critical information evaluation, ethical awareness, and digital well-being. Such an approach will better prepare teachers and students to use AI technologies confidently, critically, and responsibly in educational settings.

6.2 Operational Suggestions and Requirements for the Development of AI-based Pedagogical Models

The findings suggest that the AI-based pedagogical model should be designed to address the differing levels of AI competence among teachers and students while building on their generally positive attitudes towards technology. For teachers, the model should prioritise practical, classroom-oriented training that demonstrates how AI can be integrated into teaching, assessment, lesson planning, and personalised learning in pedagogically meaningful ways. Particular emphasis should be placed on developing confidence in the use of AI tools, promoting innovative teaching practices, and supporting the adoption of emerging technologies beyond basic digital applications.

Given that both teachers and students demonstrated comparatively low levels of ethical awareness in AI use, ethical competence should constitute a core component of the pedagogical model. This should include guidance on academic integrity, data privacy, transparency, bias detection, copyright, responsible prompting, and the critical evaluation of AI-generated content. Learning activities should encourage reflection on the ethical implications of AI-supported decision-making and foster responsible digital citizenship.

The model should also adopt a learner-centred and competence-based approach that positions AI as a tool to enhance, rather than replace, learning. AI-supported activities should promote higher-order thinking skills, creativity, collaboration, problem-solving, and self-regulated learning instead of focusing solely on task completion. Authentic classroom scenarios, project-based learning, and formative assessment strategies should be incorporated to demonstrate effective and responsible AI integration across different educational contexts.

Given the identified gaps in digital safety, the model should include practical guidance on cybersecurity, privacy management, and the protection of personal and institutional data. Teachers and students should develop the skills needed to configure privacy settings, recognise digital risks, and use AI applications in accordance with ethical and legal requirements.

The findings also highlight the need to support teachers' professional confidence in AI use. The model should therefore include hands-on training, authentic classroom examples, collaborative learning opportunities, and ready-to-use instructional resources that demonstrate how AI can enhance teaching, assessment, differentiation, and student engagement. These activities should help reduce uncertainty and encourage the pedagogically meaningful integration of AI.

Digital well-being should constitute another core component of the model. Given the low proportion of teachers who report being able to manage technostress, the pedagogical framework should incorporate strategies for maintaining a healthy balance between technology use and well-being. This should include guidance on managing digital workload, preventing technology-related stress,

promoting mindful AI use, and encouraging sustainable digital practices for both teachers and students.

Finally, the AI-based pedagogical model should be flexible, inclusive, and adaptable to different levels of digital and AI competence. Modular learning pathways, differentiated learning activities, continuous formative assessment, and opportunities for reflection should enable participants to progressively develop their competencies. By combining technical AI skills with critical thinking, ethical reasoning, digital safety, and well-being, the model can support the effective and sustainable integration of AI into educational practice while preparing teachers and students for the evolving demands of digital education.



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AI, Ethics and
New Teaching Methods



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