

DigiSET – The Academy of Digitally Sustainable European Teacher

Project Number: 101249272

ERASMUS-EDU-2025-PEX-TEACH-ACA

Teachers' Competences for Digital Sustainability in Bulgaria

A survey amongst (future) teachers

Authors: Anastasia Savova (Sindikatsno Obrazovanie kam KT "Podkrepa", Sofia),
Deyana Peykova (Osnovno uchilishte "Hristo Smirnenski", Rakovski)

Date: 15.09.2026

Version: 0.2



Licence: This report is available under CC BY 4.0 International
(see <https://creativecommons.org/licenses/by/4.0/>)

License



This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0 International), see <https://creativecommons.org/licenses/by/4.0/deed>. When using this work, you must provide appropriate credit by including the name of the original author(s), the title of the work, the year of publication, and a clear reference to the project DigiSET (Erasmus+ 101249272). Particularly images and figures originating from third parties that are properly cited are excluded from this license.

Funding



Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or EACEA. Neither the European Union nor the granting authority can be held responsible for them.

Project contribution to Agenda 2030



Acknowledgment

This report is a deliverable of the project 'DigiSET - The Academy of Digitally Sustainable European Teacher', funded within the Erasmus+ Programme with applicant Universität für Weiterbildung Krems and Grant Agreement No. 101249272.

Disclaimer on Methodology and Authorship

The development of the survey instrument was a collaborative effort involving the entire consortium. However, the selection of scales and the final composition of the questionnaire were done by Dila Ora, Sezin Esfer and Sabiha Dulay (all BAU), Filiz Keser Aschenberger (UWK), Erina Guraziu (OpenCom), and Sandra Schön (TU Graz). The analysis template as well as the data analysis process — including data cleaning, selection, and the creation of all charts and diagrams — were carried out by Bettina Mair and Sandra Schön (both TU Graz). The textual descriptions, interpretations, and conclusions presented in this report reflect the views of the respective authors listed herein and are their sole responsibility. In addition, please note that certain descriptive and introductory sections of this report are based on consortium-wide templates applied uniformly across all country reports to ensure comparability. The specific analyses, interpretations, and country-specific findings remain the responsibility of the respective national teams.

Disclaimer on AI usage

Based on Academic Integrity and Transparency in AI-assisted Research and Specification Framework (Bozkurt, 2024, DOI: 10.55982/openpraxis.16.1.654), the authors of this report acknowledge that it was drafted with the assistance of Claude (Anthropic) (version as of September 2026), complementing the human editorial process. The human authors critically assessed and validated the content to maintain academic rigor. The authors also assessed and addressed potential biases inherent in the AI-generated content. The final version of the paper is the sole responsibility of the human authors.

Recommended Citation

Savova, A., & Peykova, D. (2026). *Teachers' competences for digital sustainability in Bulgaria: A survey amongst (future) teachers*. DigiSET project (WP2). September 15, 2026. DOI: 10.5281/zenodo.22792634

Abstract

This report presents the results of the DigiSET teacher survey conducted in Bulgaria, as part of the Erasmus+ project “DigiSET – The Academy of Digitally Sustainable European Teacher” (101249272). The survey aimed to assess (future) teachers' self-perceived competences in digital teaching, artificial intelligence (AI), education for sustainable development (ESD), and open educational resources (OER), as well as their perceptions on four DigiSET-specific topics: adaptive AI use, gender bias in AI, inclusive practices for students with learning difficulties, and systems thinking for sustainability. Data were collected between May 2026 and June 2026 using an online questionnaire based on existing scales (DigCompEdu Check-In, TAICS, ATOER) and project-specific items. A total of 318 responses were received, of which 223 were included in the analysis following data cleaning procedures. Respondents were primarily female, experienced teachers (82.96% women; mean age 49.5 years) working mainly in public schools.

Key findings indicate that participants reported the highest confidence in professional engagement and protecting learners' data (over 80%), and the lowest in using dedicated digital assessment tools and in practices that give learners an active, self-directed role (33–36%). Regarding AI competence, confidence was highest in explaining what AI is (59.8%) but considerably lower for AI-based assessment and for protecting sensitive content from AI tools (around 22–30%). For ESD, teachers showed consistently high confidence regarding values and responsibility (up to 84.8%), but lower confidence in facilitating discussion of controversial sustainability issues (59.2%). In terms of OER, competence was moderate and fairly uniform across items (52–58%), with many respondents reporting only partial familiarity. Among the four DigiSET-specific topics, respondents showed the highest confidence in systems and critical thinking for sustainability (up to 79.5%) and the lowest in gender bias in AI and adaptive AI use (as low as 21%). The most pressing professional development needs identified were using adaptive learning tools, using AI in teaching, and ethical/responsible AI use, while the most frequently reported barriers were lack of time and lack of available training.

The findings should be interpreted in light of the non-probability, convenience-based sampling strategy and the fully self-reported nature of the competence measures. Despite these limitations, the results provide valuable evidence for the design of the DigiSET Teacher Academy and the development of targeted training modules tailored to the national context of Bulgaria.

Content

Abstract	3
1. Introduction.	6
2. Methodology.....	7
2.1. Survey development, ethics and analysis	7
2.2. Sampling strategy and data collection	8
2.2.1. Target population and recruitment process	8
2.2.2. Data Collection Period and Sample Overview.....	8
3. Demographic profile of respondents.....	9
3.1. Gender and age (B6, B7)	9
3.2. Status of respondents (B1)	10
3.3. School levels taught or expected to teach (B2)	10
3.4. Subjects currently taught or expected to be taught (B3)	11
3.5. Teaching Experiences (B4).....	12
4. Results	13
4.1. Self-perceived digital teaching competence.....	13
4.1.1. Professional engagement (D1-D4).....	13
4.1.2. Digital resources (D5-D7).....	13
4.1.3. Teaching and learning (D8-D11).....	14
4.1.4. Assessment (D12-D14).....	15
4.1.5. Empowering learners (D15-D17).....	15
4.1.6. Facilitating learners' digital competence (D18-D22)	16
4.2. Self-perceived AI competence	17
4.2.1. AI knowledge (A1-A4)	17
4.2.2. AI pedagogy (A5-A8).....	18
4.2.3. AI assessment (A9-A12)	19
4.2.4. AI ethics (A13-A16)	19
4.2.5. AI human-centred education (A17-A20).....	20
4.2.6. AI professional engagement (A21-A24)	21
4.3. Self-perceived education for sustainable development (ESD) competence...	22
4.3.1. Systems and critical thinking (S1-S3).....	22
4.3.2. Pedagogical practice for ESD (S4-S7)	22
4.3.3. Values and responsibility (S8-S10)	23
4.3.4. Reflective and action-oriented practice (S11-S13)	23
4.4. Self-perceived Open Educational Resource (OER) competence (O1-O5).....	24

4.5. Self-perceived competences for specific DigiSET topics	25
4.5.1. Adaptive AI use (AD1, AD2).....	25
4.5.2. Gender bias in AI (GD1, GD2)	26
4.5.3. Inclusive practices for students with learning disabilities (I1, I2)	26
4.5.4. System Thinking (S1-S3)	27
4.6. Challenges faced in integrating digital teaching and sustainability in teaching, needed competences and existing barriers	27
4.6.1. Challenges faced in integrating digital technologies and sustainability into teaching (Q1)	27
4.6.2. Competences that would help to address these challenge (Q2)	28
4.6.3. Professional development needs related to digital and sustainable teaching (P1).....	28
4.6.4. Main barriers to professional development (P2).....	29
4.6.5. Additional Insights and comments (if) (Q3)	30
5. Discussion	30
5.1. Key results concerning teachers' competences	30
5.1.1. Teachers' competence in digital teaching, AI, ESD and OER	30
5.1.2. Teachers' competence concerning the four DigiSET topics	31
5.1.3. Teachers' learning needs and interest	31
5.2. Contextualisation within the national framework and current state of research	31
5.3. Limitations.....	32
6. Implications	32
6.1. Implication for DigiSET	33
6.2. Additional insights	33
References.....	35

1. Introduction.

This section provides the background and rationale for the DigiSET survey conducted in Bulgaria, situating the study within the national context and outlining its purpose and scope.

The DigiSET project (The Academy of Digitally Sustainable European Teacher) represents a transformative initiative addressing the urgent need for digital upskilling among European educators within a cross-border framework. The primary objective of DigiSET is to develop and implement a European Academy for teachers, equipping them with the knowledge, skills, and competences to create, use, and adapt Open Educational Resources (OERs), digital technologies, and AI algorithms. DigiSET aims to enhance the digital skills of European educators, aligning with the DigCompEdu, LifeComp, and GreenComp frameworks. It addresses the specific need for teacher upskilling in digital technologies through comprehensive training and a supportive community of practice, fostering a sustainable education system across Europe.

To ensure that the training program effectively meets the needs of educators across diverse national contexts, needs analysis were conducted via a comprehensive teacher survey in all DigiSET countries. So, the presented survey in Bulgaria serves as the empirical foundation for understanding the status of digital and sustainability teaching competences, identifying specific barriers to integration, and validating the requirements for the targeted training modules.

Following this introduction, Section 2 outlines the research methodology, detailing the sampling strategy, and data collection processes specific to the national context. Section 3 provides a comprehensive demographic profile of the respondents, offering essential context regarding their professional status, teaching experience, and subject specializations. The core empirical findings are presented in Section 4. This section systematically analyses teacher competences across four primary domains: Digital Teaching Competence, AI Competence, Education for Sustainable Development (ESD), and Open Educational Resources (OER). Furthermore, it examines specific competence requirements regarding adaptive AI use, gender bias, inclusive practices, and systems thinking, alongside an analysis of faced challenges and professional development needs. Section 5 synthesizes these results through a critical discussion, contextualizing the findings within the national framework and current state of research while addressing the generalizability and limitations of the study. Finally, Section 6 delineates the implications derived from the data, offering evidence-based recommendations for the development of the DigiSET Framework of Learning Outcomes and proposing strategies for the integration of these outcomes into national teacher training provisions.

In Bulgaria, the digital transformation of education is a central strategic priority, formalised in the Strategic Framework for the Development of Education, Training and Learning in the Republic of Bulgaria (2021–2030) and its accompanying Action Plan 2025–2027, which position the development of teachers' digital competences as a key driver of system-wide modernisation (Ministry of Education and Science, 2021). National digital infrastructure, including the Digital Backpack platform and the

national Catalogue of Open Educational Resources, has expanded considerably in recent years, whereas artificial intelligence in education is only beginning to receive dedicated policy attention, most notably through the Draft Vision for the Introduction and Use of Artificial Intelligence in Bulgarian School Education, published for public consultation in January 2026 (Ministry of Education and Science, 2026). Sustainability, by contrast, continues to be addressed mainly as a cross-curricular theme embedded in subjects such as geography, biology and civic education, rather than as an integrated component of teachers' digital competence profiles. The DigiSET Country Desktop Research for Bulgaria identifies the limited integration of the digital and sustainability agendas, and the still-emerging nature of AI-related teacher competences, as key national gaps that the present survey seeks to examine empirically (Savova & Peykova, 2026).

2. Methodology

This section describes the methodological approach underlying the DigiSET teacher survey in Bulgaria, including the survey development, sampling strategy, data collection procedures, and analytical methods employed.

2.1. Survey development, ethics and analysis

A detailed description of the questionnaire design and the analysis is given in a report by DigiSET (Keser Aschenberger et al., 2026).

Beyond the description, interpretation and contextualisation of the centrally processed survey results presented in Sections 4 and 5, the Bulgarian team calculated one additional, country-specific analysis: a domain-level composite indicator derived from the published percentage tables (see below). No further statistical testing - e.g., correlations or cross-tabulations against demographic variables - was possible, as the Bulgarian team did not have access to respondent-level survey data.

To complement the item-level results in Sections 4 and 5, the average share of “high” responses (often/always, agree/strongly agree, or very/completely confident, depending on the response scale used) and the average share of “low” responses (never/rarely, disagree/strongly disagree, or not/slightly confident) was calculated across all items within each subarea, and these subarea averages were then averaged within each domain. This composite analysis confirms and quantifies the pattern discussed qualitatively in Section 5.1: education for sustainable development (ESD) shows by far the strongest self-perceived competence overall, followed by digital teaching competence and OER competence, while AI competence and, in particular, the four DigiSET-specific topics show markedly lower composite competence, confirming these as the clearest overall priority areas for the DigiSET Teacher Academy in Bulgaria (Table 1).

Domain	High-response avg. (%)	Low-response avg. (%)
Education for sustainable development (ESD)	72.4	2.7

Digital teaching competence	62.1	16.6
Open Educational Resources (OER) competence	55.2	7.2
AI competence	37.6	30.7
DigiSET-specific topics (adaptive AI use, gender bias in AI, inclusive practices)	32.9	40.0

Table 1: Domain-level composite competence indicator (Bulgaria), calculated from the centrally processed item-level percentages.

2.2. Sampling strategy and data collection

2.2.1. Target population and recruitment process

The target population comprised (future) teachers in Bulgaria, including in-service teachers employed in public and private schools, as well as pre-service teachers enrolled in teacher education programmes. Recruitment was carried out jointly by the two Bulgarian DigiSET partners, Sindikat Obrazovanie kam KT “Podkrepa” (SEP) and Osnovno uchilishte “Hristo Smirnenski” (OUHS). The survey link was disseminated primarily through trade union channels and teacher professional networks affiliated with SEP, reaching teachers across different school types and regions of the country, and through the professional network of OUHS. The survey was additionally promoted via social media channels to reach a broader group of in-service and pre-service teachers. This combined recruitment strategy relied on convenience and snowball sampling rather than on random or stratified sampling of the national teacher population.

2.2.2. Data Collection Period and Sample Overview

Data collection in Bulgaria took place between 18 May and 9 June 2026.

Error! Reference source not found. details the responses received and the resulting sample used for the analysis.

Table 2: Responses and used entries of the teacher survey in Bulgaria

Responses and used data	
Total	318
No questions answered	93
Only one or two questions	2
Included in the analysis (n)	223

3. Demographic profile of respondents

This section presents the demographic characteristics of the survey participants in Bulgaria, including gender, age, professional status, school levels, subjects taught, and teaching experience, thereby providing the context for interpreting the subsequent findings.

3.1. Gender and age (B6, B7)

Error! Reference source not found. shows the gender distribution of the survey participants. Among the 135 respondents who answered this question, 82.96% (n=112) identified as women, 14.07% (n=19) as men, and 2.96% (n=4) preferred not to say; no respondents identified as non-binary or another gender identity.

Table 3: Gender of participants in the teacher survey in Bulgaria

	How do you identify your gender?	
	Frequency	Percent
Woman	112	83,0
Man	19	14,1
Non-binary / Another gender identiy	0	0,0
Prefer not to say	4	3,0
Total	135	100,0

Figure 1 shows the age distribution of the participants. Among the 119 respondents who provided their age, the mean age was 49.5 years (median = 50 years, SD = 8.8), ranging from 25 to 69 years.

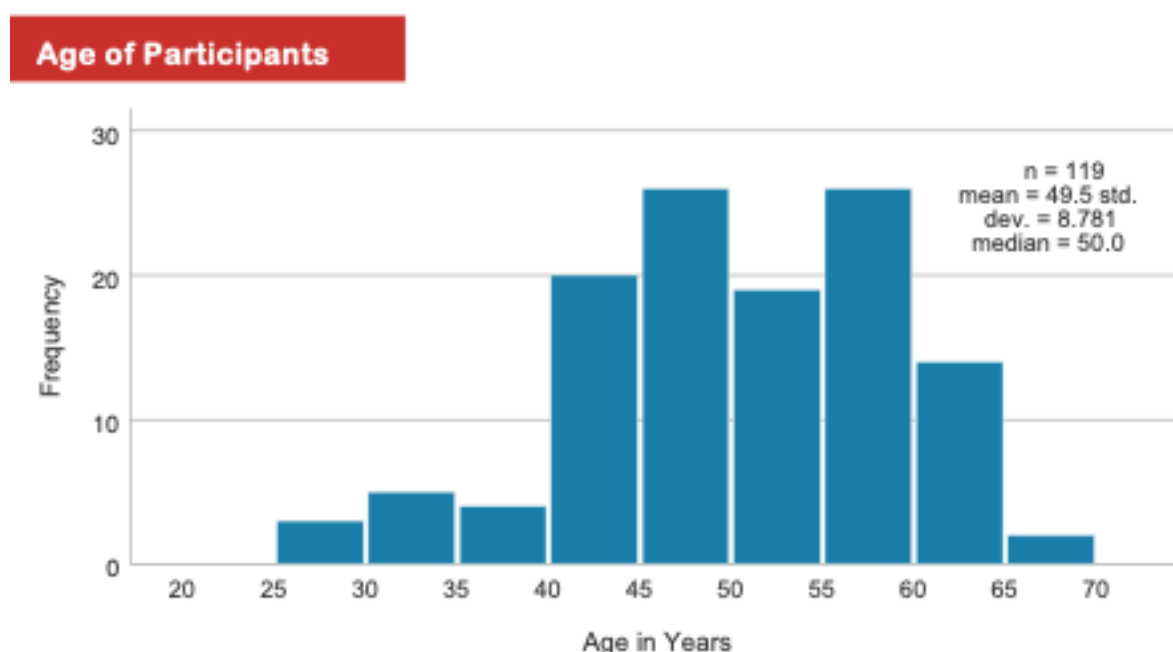


Figure 1: Age of participants in the DigiSET teacher survey in Bulgaria.

3.2. Status of respondents (B1)

Figure 2 shows the current status of participants (multiple responses were possible). The large majority of respondents (91.18%) reported working at a public/state-funded school. Smaller shares reported working at a private/independent school (2.21%), studying to be a teacher (0.74%), or currently looking for a job (0.74%). No respondent reported working at a church/religious-affiliated school. A further 8.09% selected “Other”; the free-text responses under this option most frequently referred to working in kindergartens, a school type not explicitly listed among the response options.

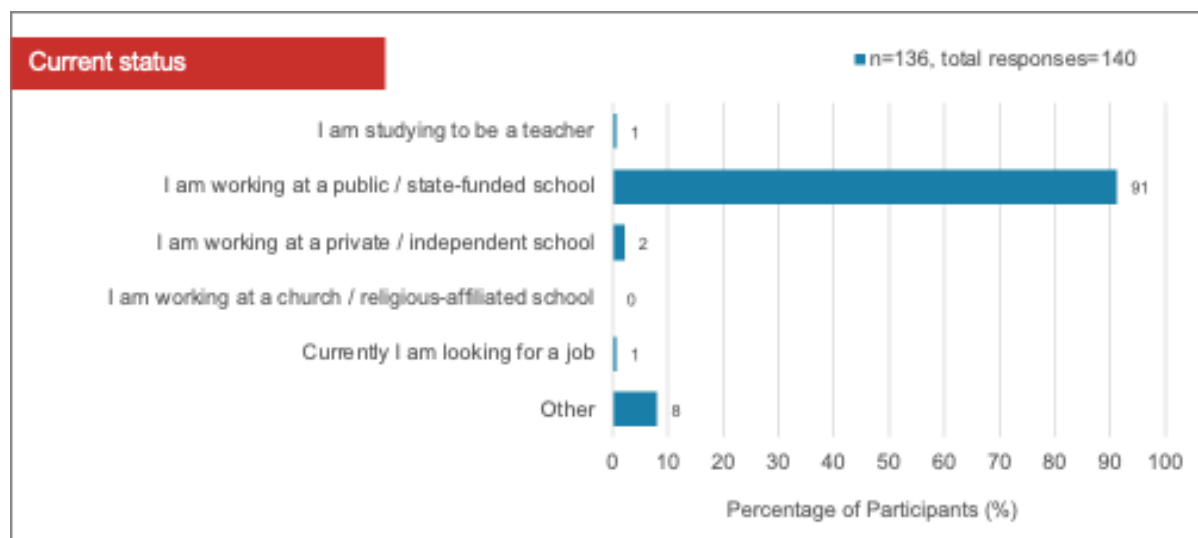


Figure 2: Current status of participants in the DigiSET teacher survey in Bulgaria.

Note: Multiple responses were allowed; therefore, totals exceed 100%.

3.3. School levels taught or expected to teach (B2)

Figure 3 shows the school levels at which participants currently teach or expect to teach (multiple responses were possible). Lower secondary level (ISCED 2) was the most frequently reported level (38.24%), followed by upper secondary level (ISCED 3, 35.29%), primary level (ISCED 1, 32.35%), and vocational education (ISCED 3/4, 18.38%). A further 7.35% selected “Other”; the free-text responses again mostly referred to pre-school/kindergarten education, an ISCED 0 level not included among the predefined options.

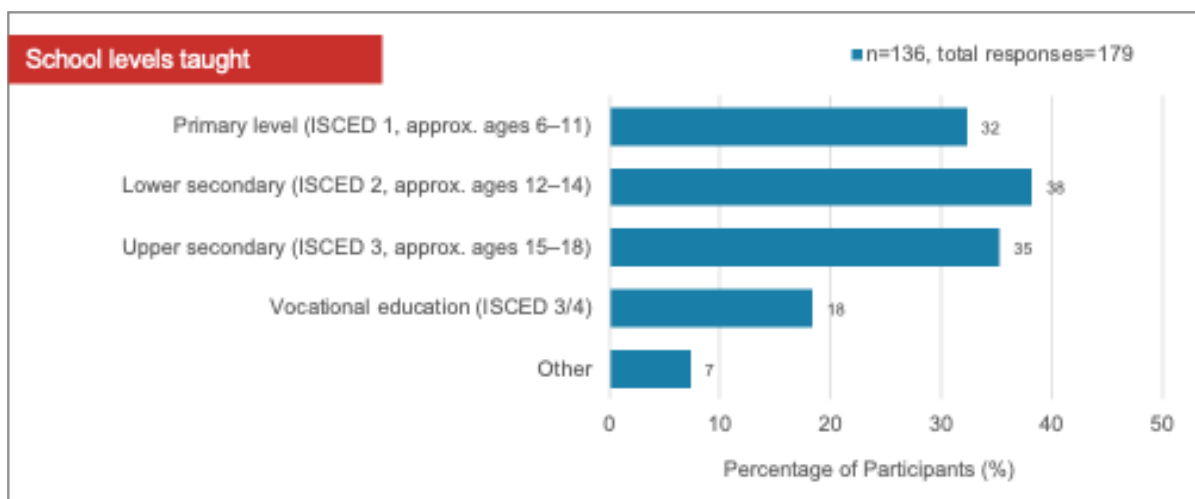


Figure 3: School levels taught or expected to be taught by participants in the DigiSET teacher survey in Bulgaria.

Note: Multiple responses were allowed; therefore, totals exceed 100%.

3.4. Subjects currently taught or expected to be taught (B3)

Figure 4 shows the school subjects that participants currently teach or expect to teach (multiple responses were possible). Mathematics was the most frequently reported subject (28.03%), followed by native language/reading (26.52%), foreign languages (20.45%), social sciences/history and art/music (each 15.91%), natural sciences (15.15%), computer science/digital literacy (12.88%), physical education (12.12%), and vocational subjects (9.85%). A further 12.12% selected “Other”. Analysis of the free-text responses under this option shows that they mainly reflect specialised teaching roles not covered by the predefined subject list, including resource/support teachers, pre-school pedagogues, and subject-specific areas such as computer modelling, programming and robotics, and technology and entrepreneurship.

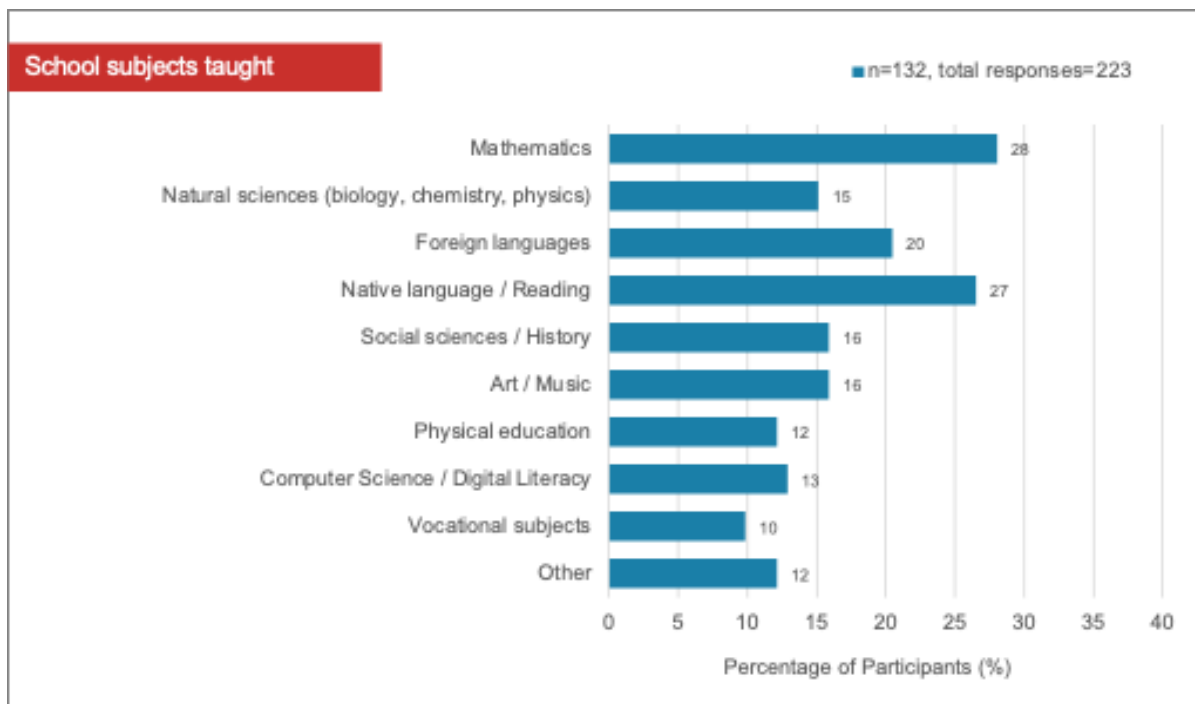


Figure 4: Subjects currently taught or expected to be taught by participants in the DigiSET teacher survey in Bulgaria.

Note: Multiple responses were allowed; therefore, totals exceed 100%.

3.5. Teaching Experiences (B4)

Figure 5 shows the teaching experience of participants. Nearly half of the respondents (49.26%) reported more than 20 years of teaching experience, followed by 6–10 years (15.44%), 11–15 years (13.97%), 1–5 years (13.24%), 16–20 years (6.62%), and less than 1 year (1.47%). No respondent reported having no teaching experience at all. Overall, the sample is characterised by a high share of experienced teachers.

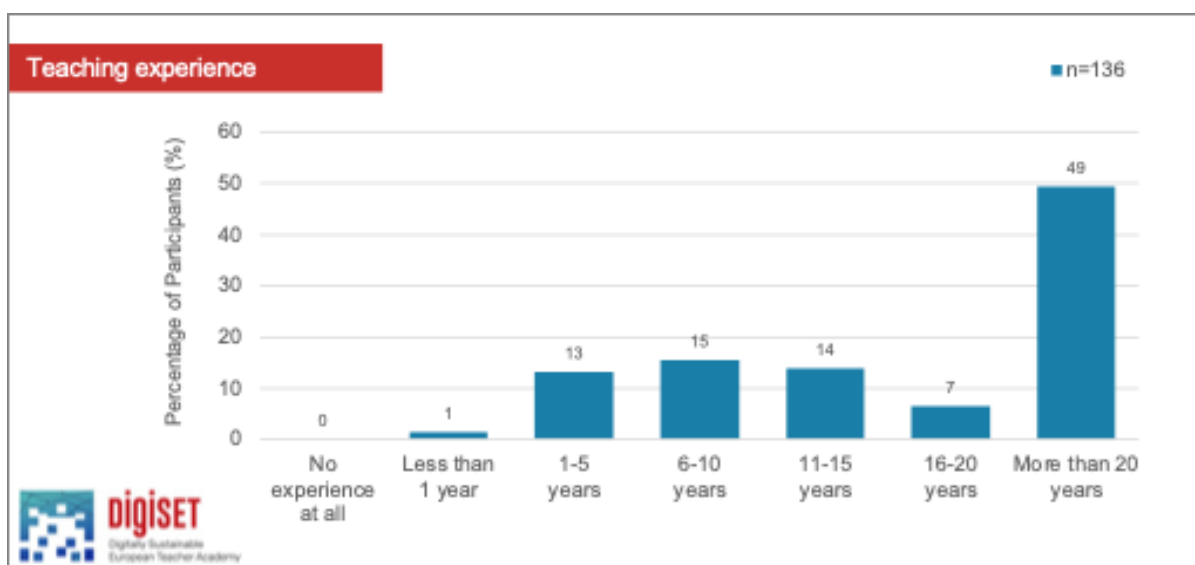


Figure 5: Teaching experiences of participants in the DigiSET teacher survey in Bulgaria.

4. Results

This section reports the findings of the DigiSET teacher survey in Bulgaria across four core competence domains — digital teaching, AI, education for sustainable development (ESD), and open educational resources (OER) — as well as specific DigiSET focus topics, followed by an analysis of challenges faced and professional development needs identified by respondents.

4.1. Self-perceived digital teaching competence

4.1.1. Professional engagement (D1-D4)

Figure 6 shows self-perceived digital competence in the area of professional engagement. Most respondents reported using different digital channels to communicate with learners and colleagues often or always (80.6% combined), and a similarly high share reported actively developing their digital competence for teaching often or always (76.3%). Awareness of and participation in online training opportunities was also frequently reported (70.6% often/always). Collaborating with colleagues inside and outside the educational organisation through digital technologies was somewhat less frequent, though still reported by the majority of respondents (65.6% often/always). Overall, professional engagement was consistently rated positively, with very few respondents reporting never or rarely engaging in these practices.

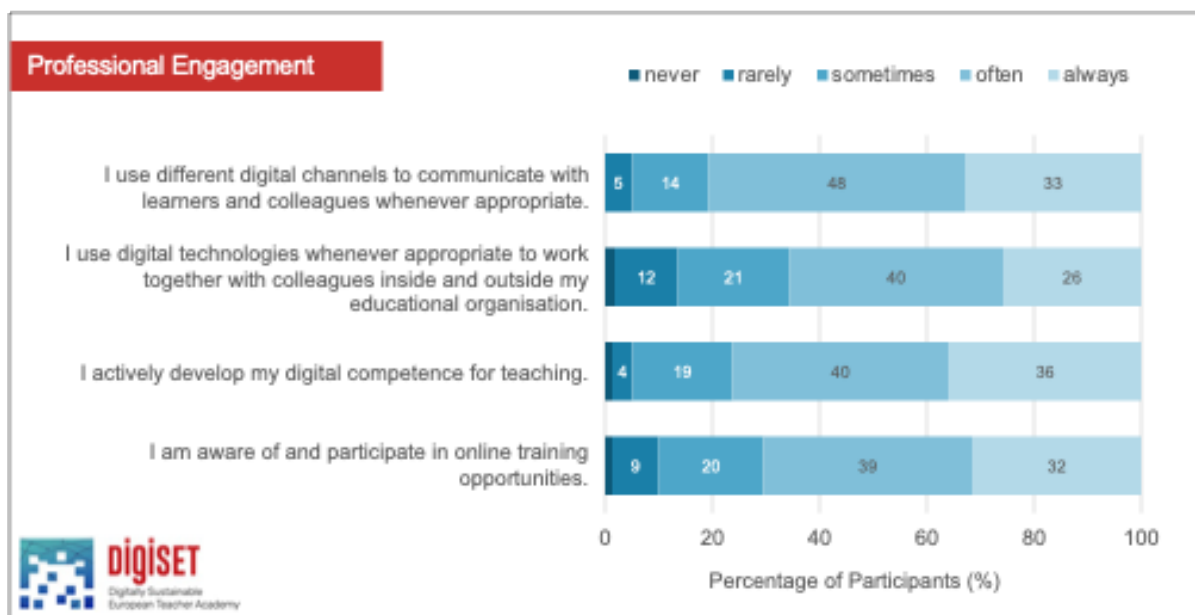


Figure 6: Self-perceived digital teaching competence – professional engagement.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing the items from DigCompEdu CheckIn questionnaire, area “professional engagement”, JRC, n.d., p. 11ff.

4.1.2. Digital resources (D5-D7)

Figure 7 presents self-perceived competence in using digital resources. Protecting personal data (e.g., exam results, learners' grades) was the practice most consistently reported, with 88.7% of respondents doing so often or always. Searching for and selecting digital resources using different internet sites and strategies was also common (84.2% often/always). Creating one's own digital

resources or modifying existing ones to adapt them to specific needs was reported less frequently: just over half of respondents (52.3%) did so often or always, and a notable share (25.2%) did so never or rarely.

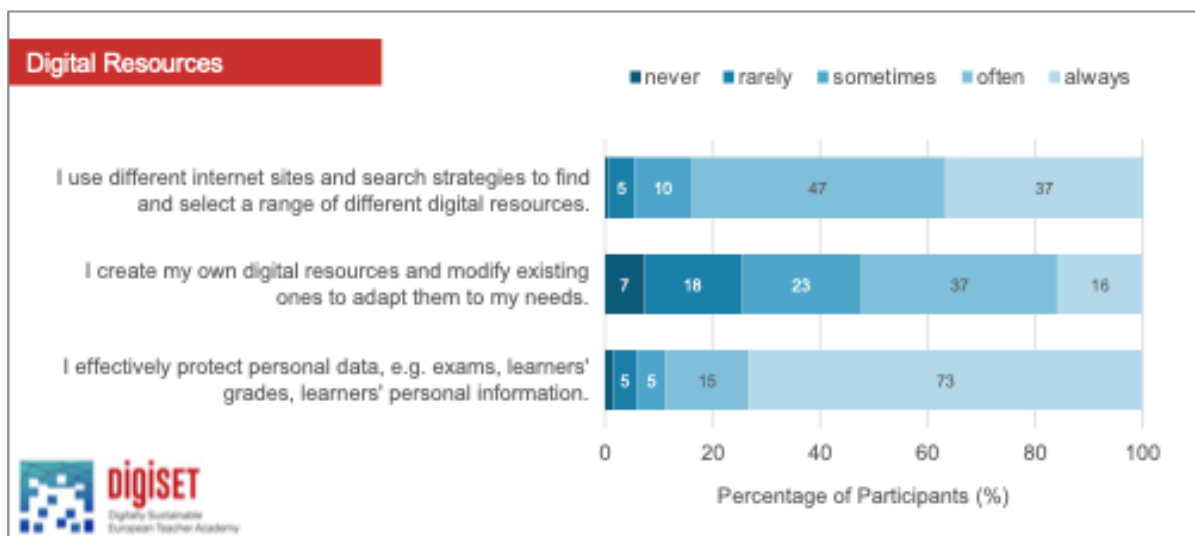


Figure 7: Self-perceived digital teaching competence – digital resources.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing the items from DigCompEdu CheckIn questionnaire, area “digital resources”, JRC, n.d., p. 17ff.

4.1.3. Teaching and learning (D8-D11)

Figure 8 shows self-perceived competence in the area of teaching and learning. A large majority of respondents (86.5%) reported carefully considering how, when and why to use digital technologies with learners often or always, and most (67.4%) also reported following learners' activities and interactions in collaborative online environments often or always. Practices requiring learners to take a more active or self-directed role were reported less frequently: only 45.2% of respondents said learners often or always use digital technologies to accomplish group tasks, and just 36.1% reported often or always using digital technologies to let learners plan, document and monitor their own learning, with 32.8% reporting this never or rarely.

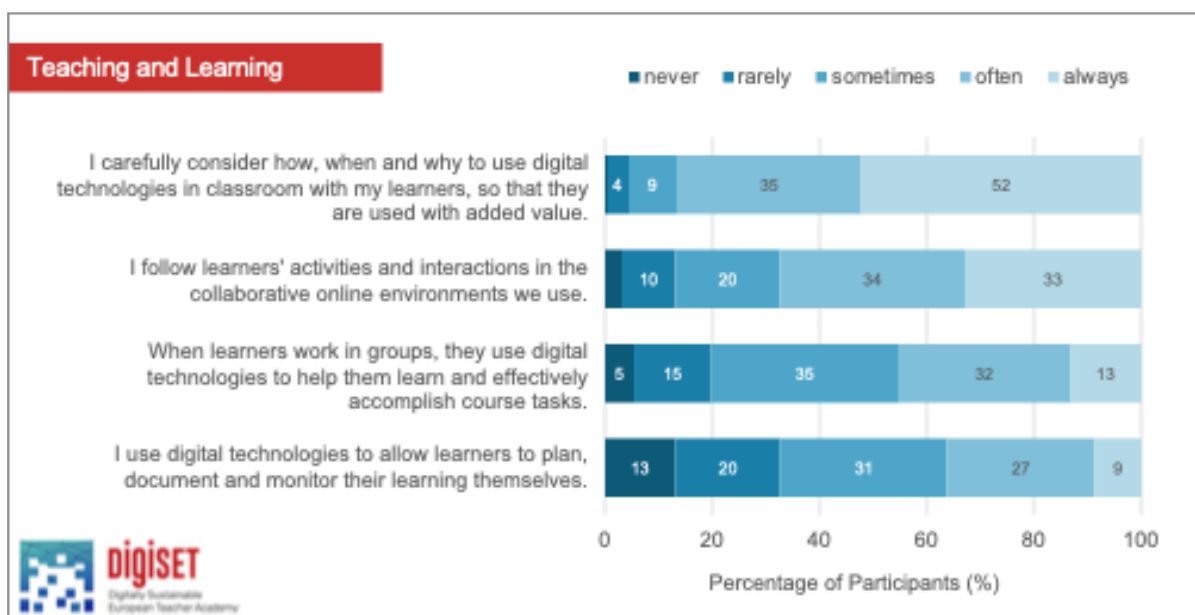


Figure 8: Self-perceived digital teaching competence – teaching and learning.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing the items from DigCompEdu CheckIn questionnaire, area “teaching and learning”, JRC, n.d., p. 21ff.

4.1.4. Assessment (D12-D14)

Figure 9 presents self-perceived competence in the area of assessment. Using digital technologies to provide effective feedback (57.2% often/always) and analysing available data to identify learners who need additional support (61.3% often/always) were relatively common practices. The use of dedicated digital assessment tools to monitor learner progress was less established, with just over a third of respondents (35.3%) reporting often or always doing so, and a substantial share (34.9%) reporting never or rarely using such tools.

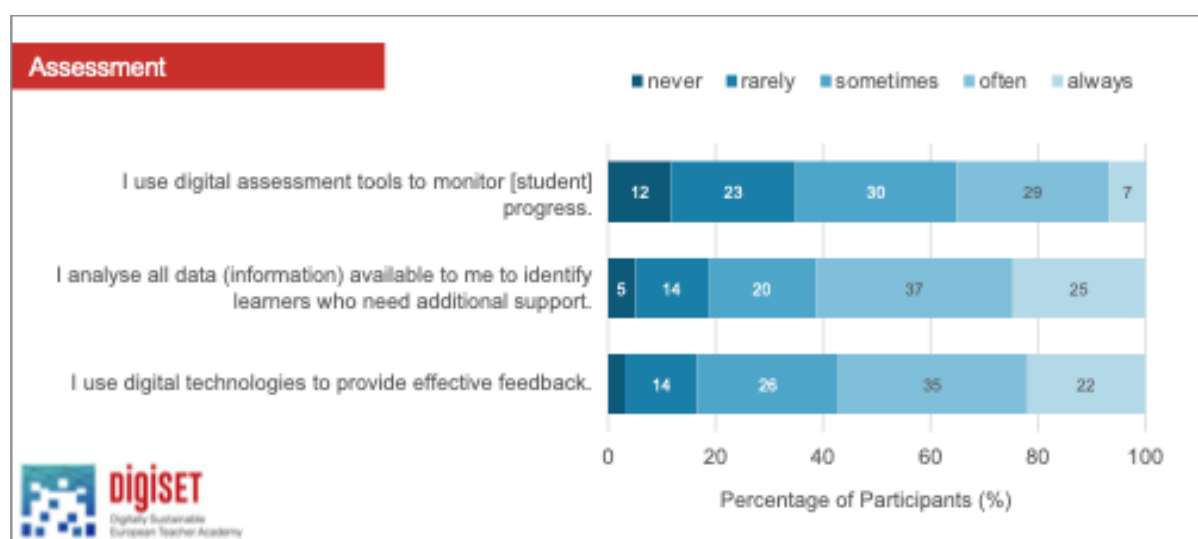


Figure 9: Self-perceived digital teaching competence – assessment.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing the items from DigCompEdu CheckIn questionnaire, area “assessment”, JRC, n.d., p. 27ff.

4.1.5. Empowering learners (D15-D17)

Figure 10 shows self-perceived competence in empowering learners. Most respondents (72.4%) reported often or always taking potential practical or technical difficulties into account when creating digital assignments. Using digital technologies to enable learners' active participation in class or online learning was also fairly common (56.9% often/always). Offering learners personalised learning opportunities through digital technologies was reported less frequently, with less than half of respondents (46.6%) doing so often or always.

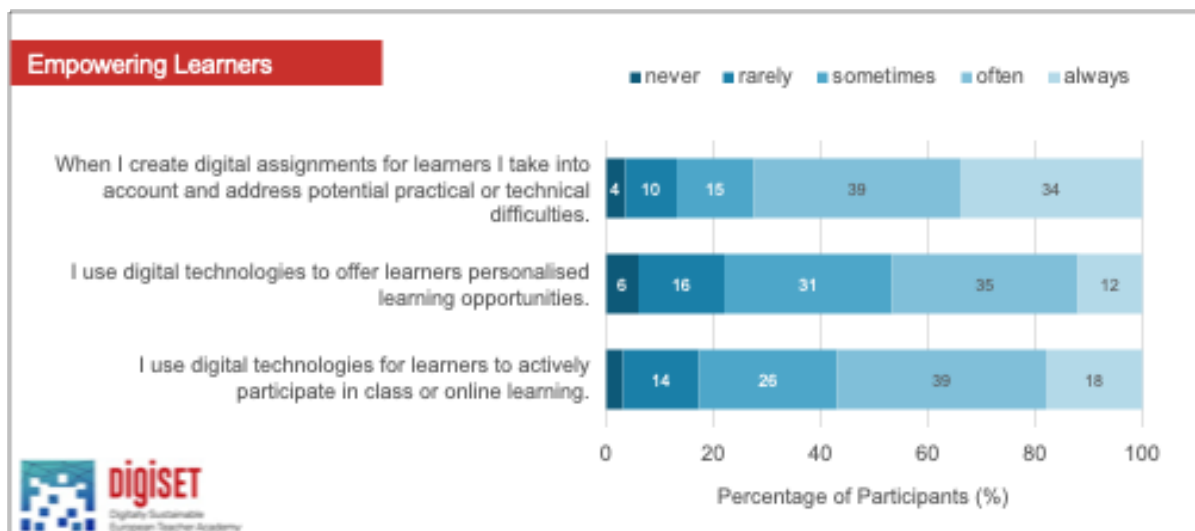


Figure 10: Self-perceived digital teaching competence – empowering learners.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing the items from DigCompEdu CheckIn questionnaire, area “empowering learners”, JRC, n.d., p. 32ff.

4.1.6. Facilitating learners' digital competence (D18-D22)

Figure 11 presents self-perceived competence in facilitating learners' digital competence. Teaching learners to use digital technology safely and responsibly was the most frequently reported practice (75.1% often/always), followed by teaching learners how to assess the reliability of information (68.8% often/always) and encouraging learners to use digital technologies creatively to solve concrete problems (57.9% often/always). Practices that require learners to actively produce digital content or collaborate with an outside audience were less established: only 42.1% of respondents reported often or always setting up tasks requiring digital communication and collaboration with an outside audience, and just 33.1% reported often or always setting up assignments requiring learners to create digital content, with 39.8% reporting this never or rarely.

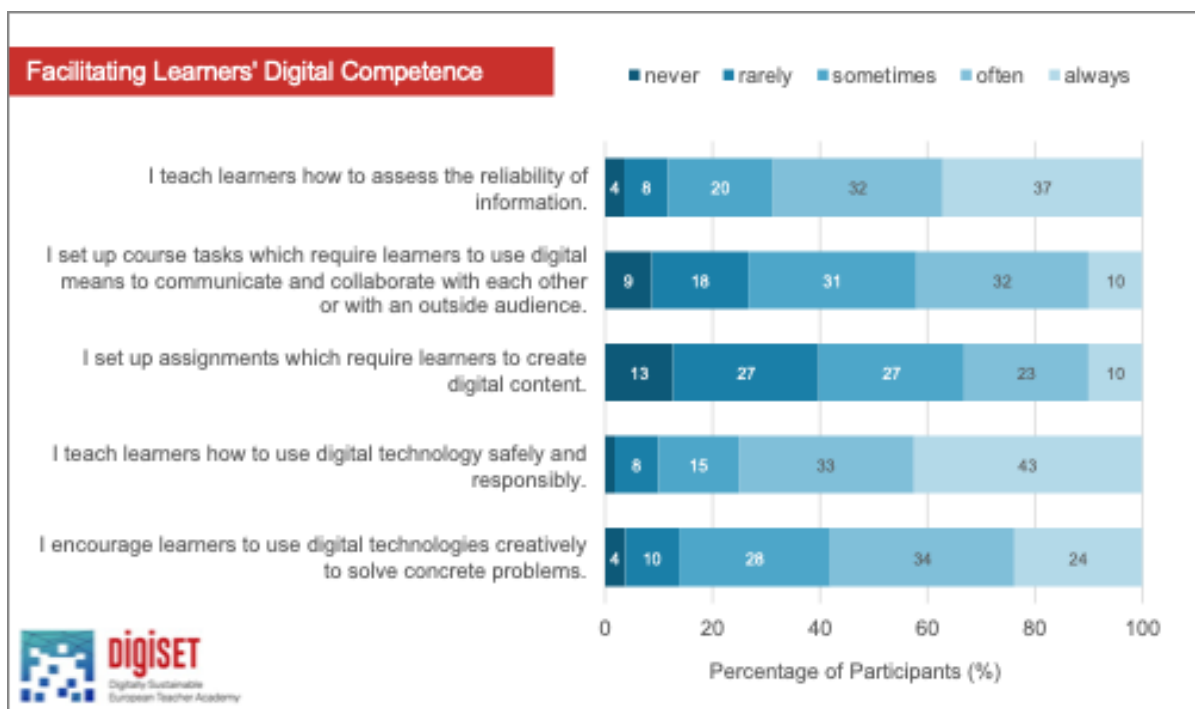


Figure 11: Self-perceived digital teaching competence – facilitating learners' digital competence.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing the items from DigCompEdu CheckIn questionnaire, area “facilitating learners’s digital competence”, JRC, n.d., p. 37ff.

4.2. Self-perceived AI competence

4.2.1. AI knowledge (A1-A4)

Figure 12 shows self-perceived AI knowledge. Respondents felt most confident explaining what AI is, with 59.8% reporting being very or completely confident, followed by creating content with AI (56.1% very/completely confident). Confidence was lower regarding more specific or technical aspects: only 41.5% felt very or completely confident distinguishing whether a tool is AI-based, and just 35% felt very or completely confident explaining what generative AI is, with 30.2% reporting not being confident or only slightly confident in this respect.

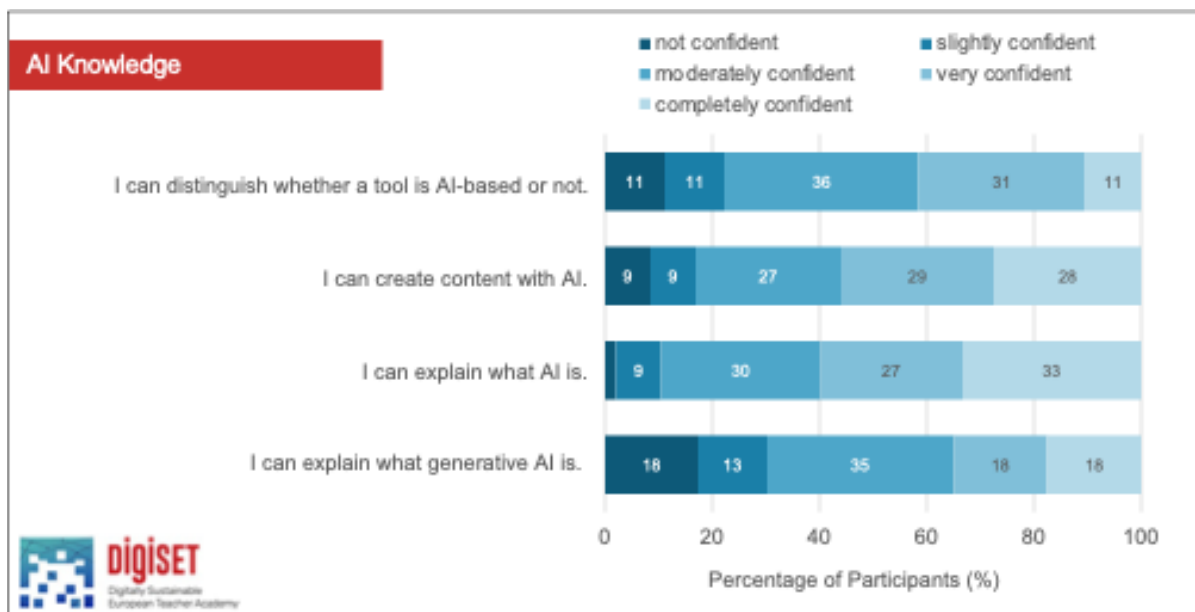


Figure 12: Self-perceived AI competence – AI knowledge.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing items from Chiu, Ahmad, & Çoban (2025) section “AI knowledge”.

4.2.2. AI pedagogy (A5-A8)

Figure 13 presents self-perceived AI pedagogy competence. Confidence levels were broadly similar across the first three items, with around 37–38% of respondents reporting being very or completely confident in choosing an AI tool that enhances their teaching (37.4%), choosing an AI tool suited to their subject content (38.1%), and teaching lessons that appropriately combine subject content, AI tools and teaching approaches (37.9%). Confidence was notably lower when it came to helping colleagues design learning activities that combine subject content, AI tools and teaching approaches, with only 27.5% reporting being very or completely confident and 36% reporting not being confident or only slightly confident.

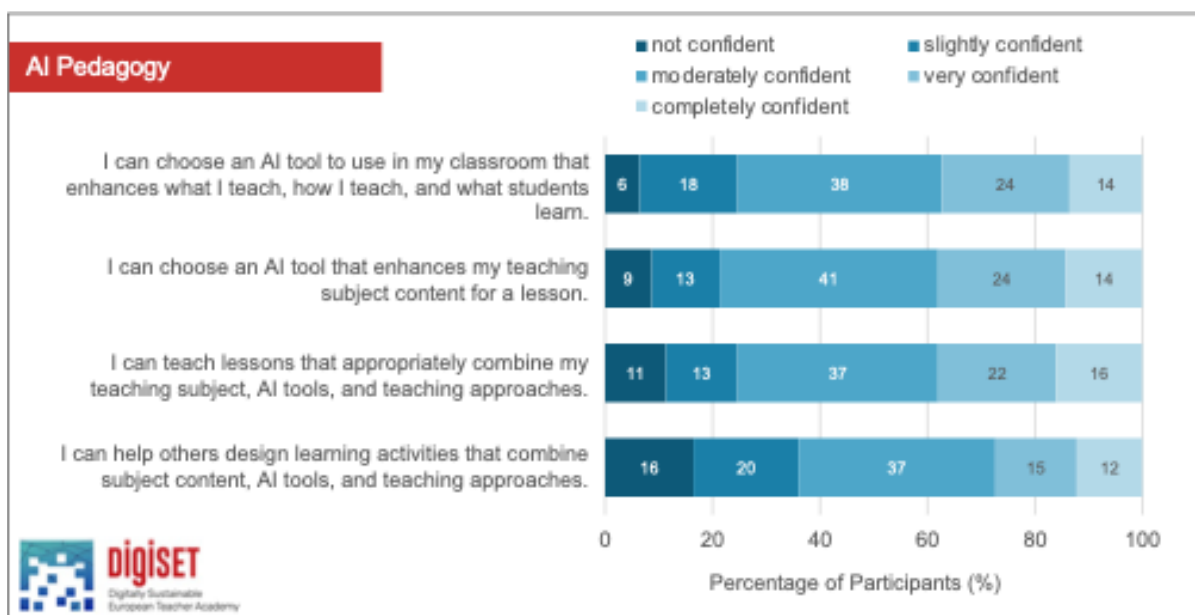


Figure 13: Self-perceived AI competence – AI pedagogy.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing items from Chiu, Ahmad, & Çoban (2025) section “AI pedagogy”.

4.2.3. AI assessment (A9-A12)

Figure 14 shows self-perceived AI assessment competence, which was the lowest-rated of the AI competence areas. Confidence was modest across all four items, with very or completely confident responses ranging from 22.3% (assessing student learning in an AI-based environment) to 30.7% (using an AI tool to foster assessment for learning). Around a quarter of respondents reported not being confident at all in designing an assessment approach for an AI-based environment (23.3%) or in assessing student learning in such an environment (26.6%), pointing to a clear professional development need in this area.

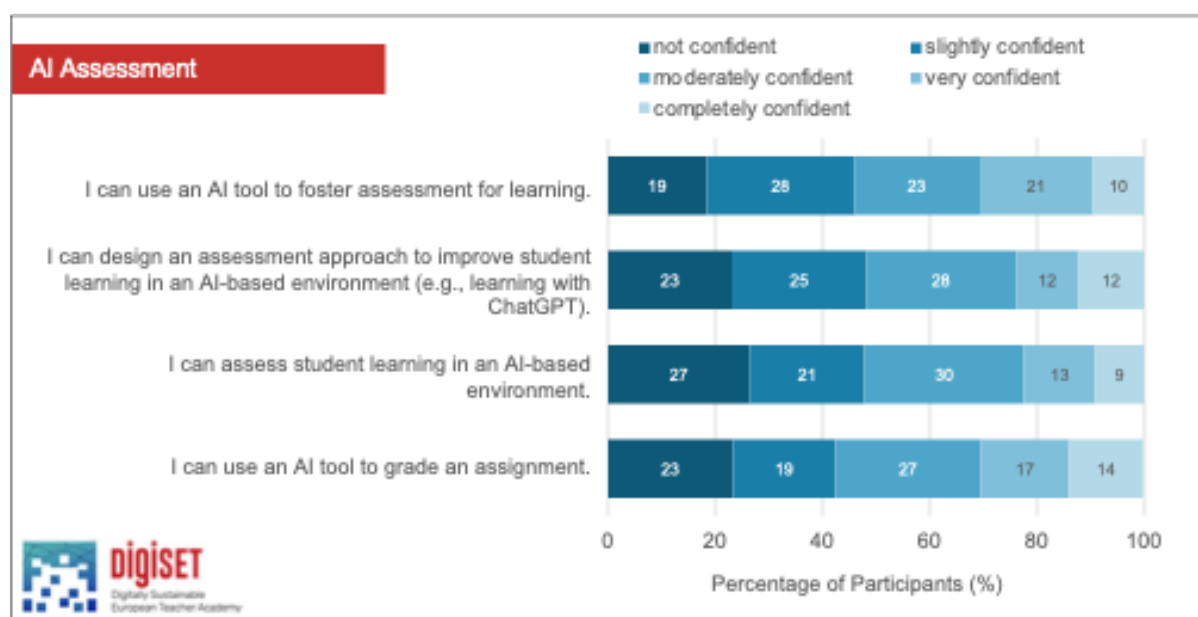


Figure 14: Self-perceived AI competence – AI assessment.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing items from Chiu, Ahmad, & Çoban (2025) section “AI assessment”.

4.2.4. AI ethics (A13-A16)

Figure 15 presents self-perceived AI ethics competence. Respondents felt most confident teaching students how to behave safely and responsibly when learning with AI tools (44.4% very/completely confident) and ensuring their own health and well-being while using AI tools (37.7% very/completely confident). Confidence was lower for teaching students ethics related to AI (27.8% very/completely confident) and, in particular, for protecting sensitive content such as exams or students' grades from AI tools, where less than a quarter of respondents (23.4%) felt very or completely confident and 47.9% reported not being confident or only slightly confident.

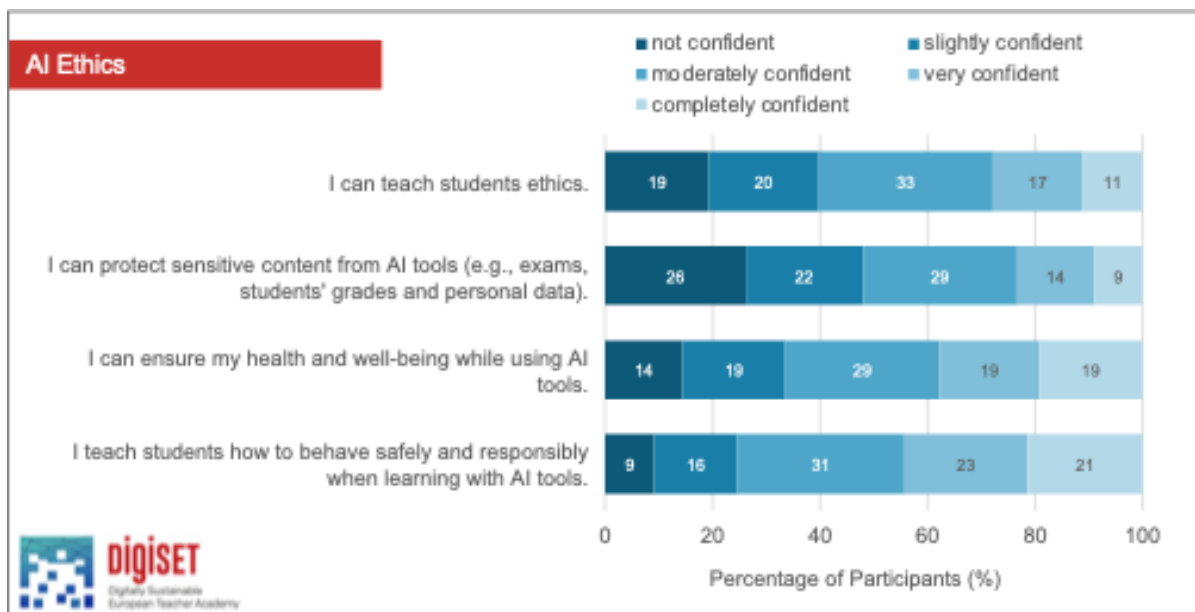


Figure 15: Self-perceived AI competence – AI ethics.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing items from Chiu, Ahmad, & Çoban (2025) section “AI ethics”.

4.2.5. AI human-centred education (A17-A20)

Figure 16 shows self-perceived competence in human-centred AI education. Respondents felt most confident recognising that humans are responsible for AI bias (58% very/completely confident) and explaining how AI impacts society (52.2% very/completely confident). Confidence was somewhat lower for the more evaluative items: 39% felt very or completely confident assessing the benefits of an AI tool, and 37.1% felt very or completely confident assessing its risks, suggesting that critical, evaluative AI skills may need more targeted support than general awareness of AI's societal role.

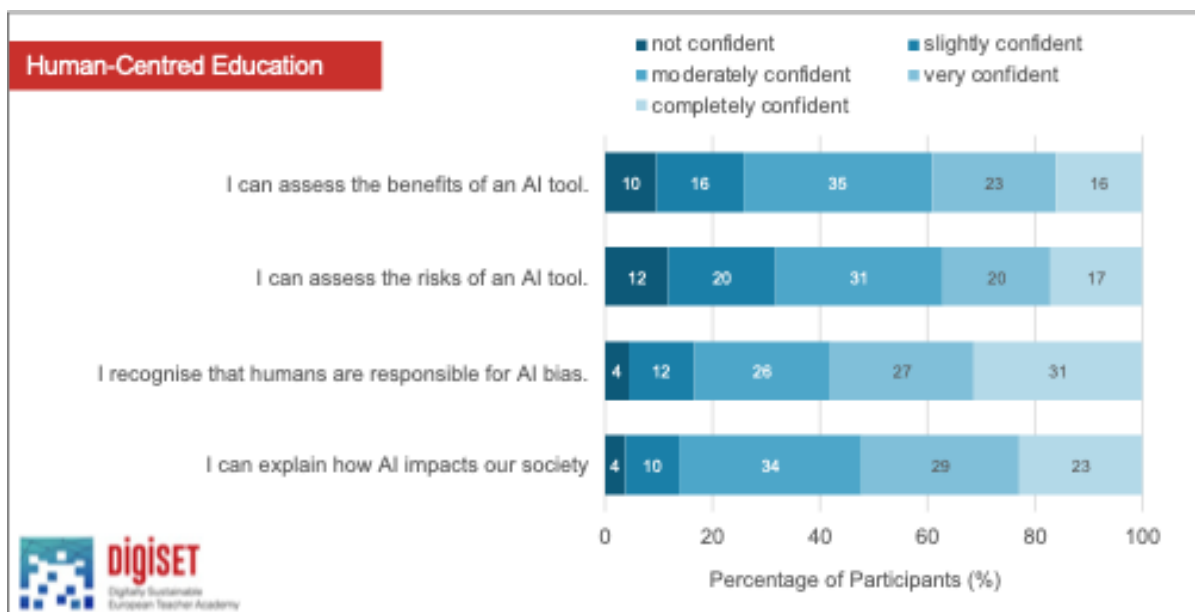


Figure 16: Self-perceived AI competence – human-centred education.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing items from Chiu, Ahmad, & Çoban (2025) section “human-centred education”.

4.2.6. AI professional engagement (A21-A24)

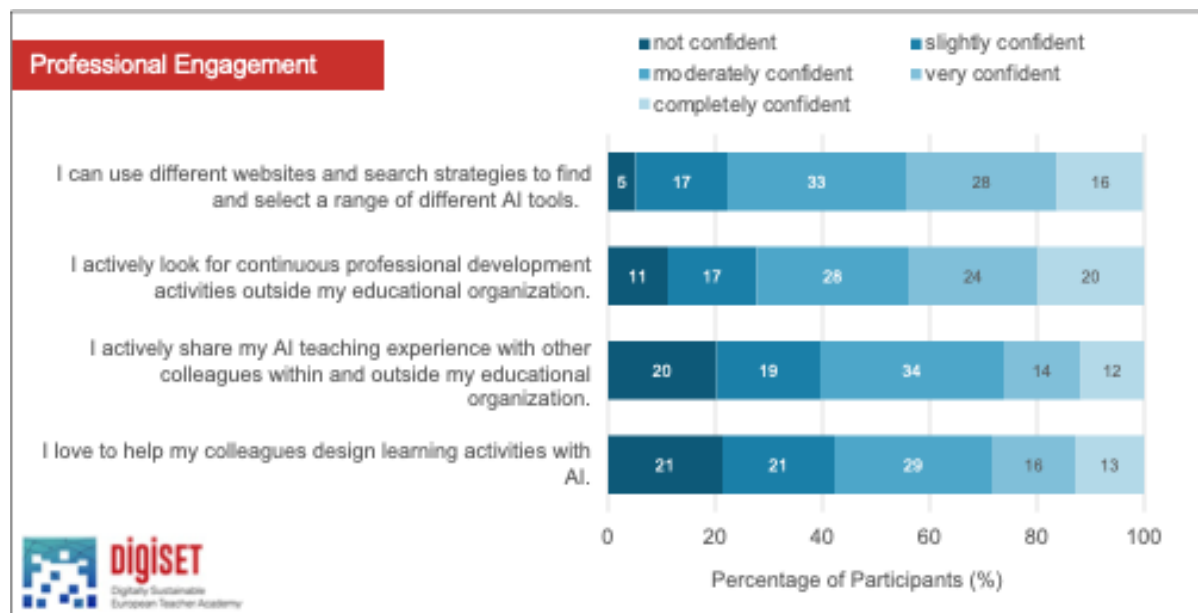


Figure 17 presents self-perceived AI professional engagement. Respondents felt reasonably confident finding and selecting AI tools using different websites and search strategies (44.3% very/completely confident) and in actively seeking continuous professional development opportunities outside their institution (43.9% very/completely confident). Confidence was notably lower for collaborative and mentoring activities: only around a quarter of respondents felt very or completely confident sharing their AI teaching experience with colleagues (26.2%) or helping colleagues design learning activities with AI (28.3%), with around 40–42% reporting not being confident or only slightly confident in each of these two areas.

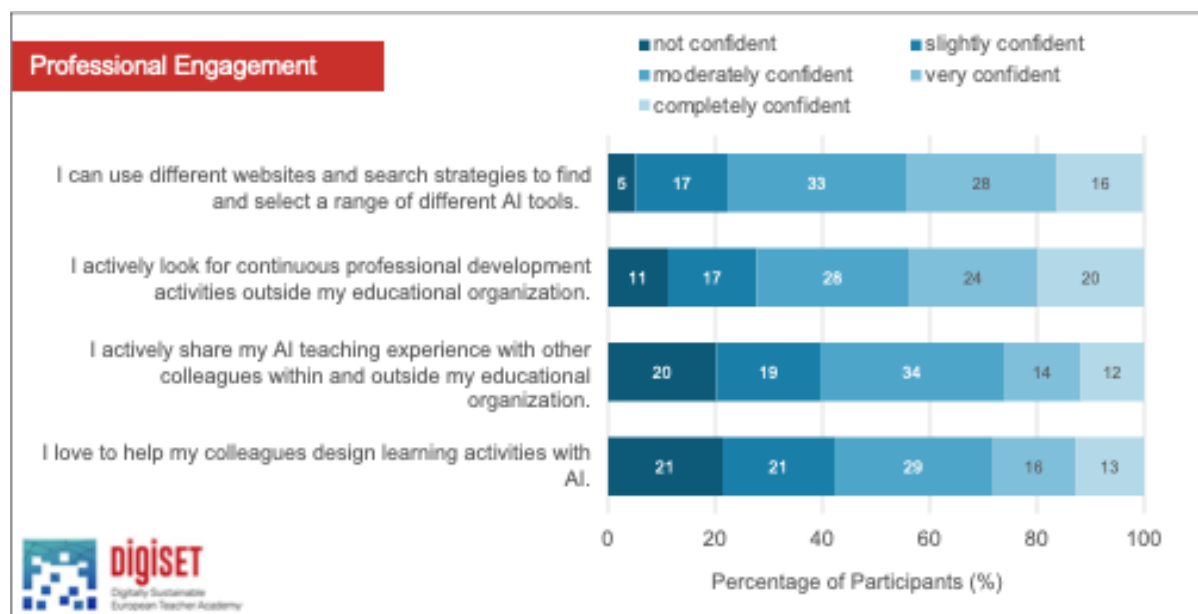


Figure 17: Self-perceived AI competence – professional engagement.

Note: Responses to the DigiSET teacher survey in Bulgaria, utilizing items from Chiu, Ahmad, & Çoban (2025) section “professional engagement”.

4.3. Self-perceived education for sustainable development (ESD) competence

4.3.1. Systems and critical thinking (S1-S3)

The questions on systems and critical thinking are presented in 4.5. (p. 25ff) as they are specifically addressing a DigiSET core topic.

4.3.2. Pedagogical practice for ESD (S4-S7)

Figure 18 shows self-perceived pedagogical practice for ESD. A majority of respondents agreed or strongly agreed that they integrate sustainability topics into their teaching practice (68.2%) and use participatory, learner-centred approaches when addressing sustainability (66.2%). Around half of respondents agreed or strongly agreed that they design learning activities promoting active engagement with sustainability challenges (52.5%) and use digital technologies to engage learners with real-world sustainability challenges (51.9%), with a substantial share of respondents (around 40%) responding neutrally to these two items, suggesting room for development in translating sustainability awareness into concrete, digitally supported learning activities.

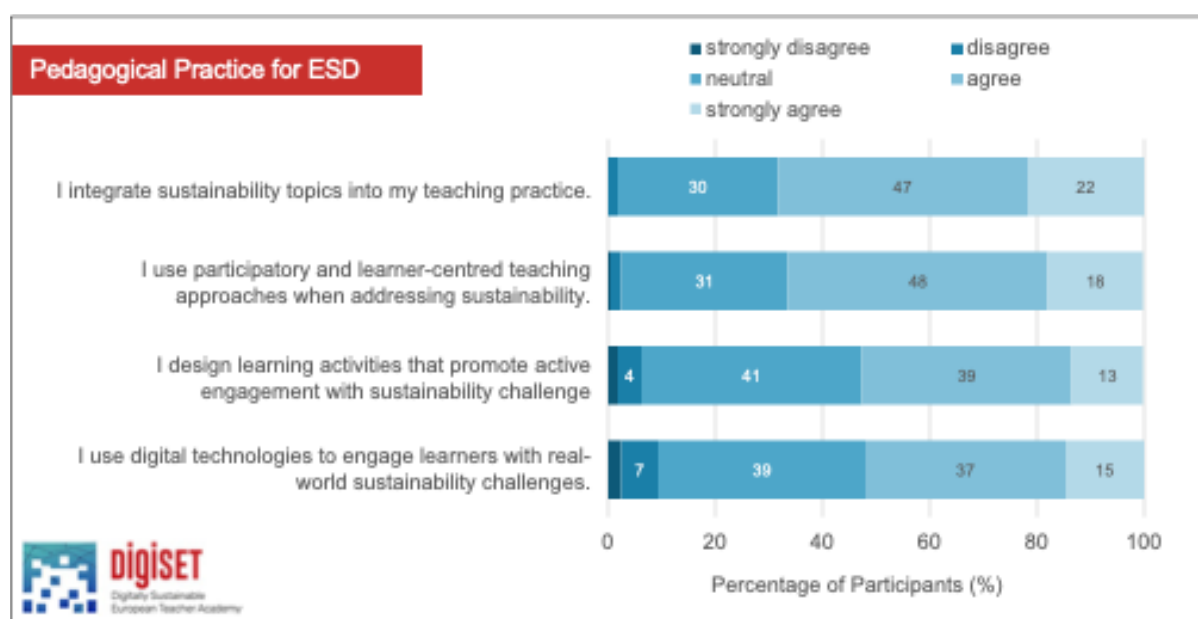


Figure 18: Self-perceived ESD competence – pedagogical practice for ESD.

Note: Responses to the DigiSET teacher survey in Bulgaria, items were created for the DigiSET survey.

4.3.3. Values and responsibility (S8-S10)

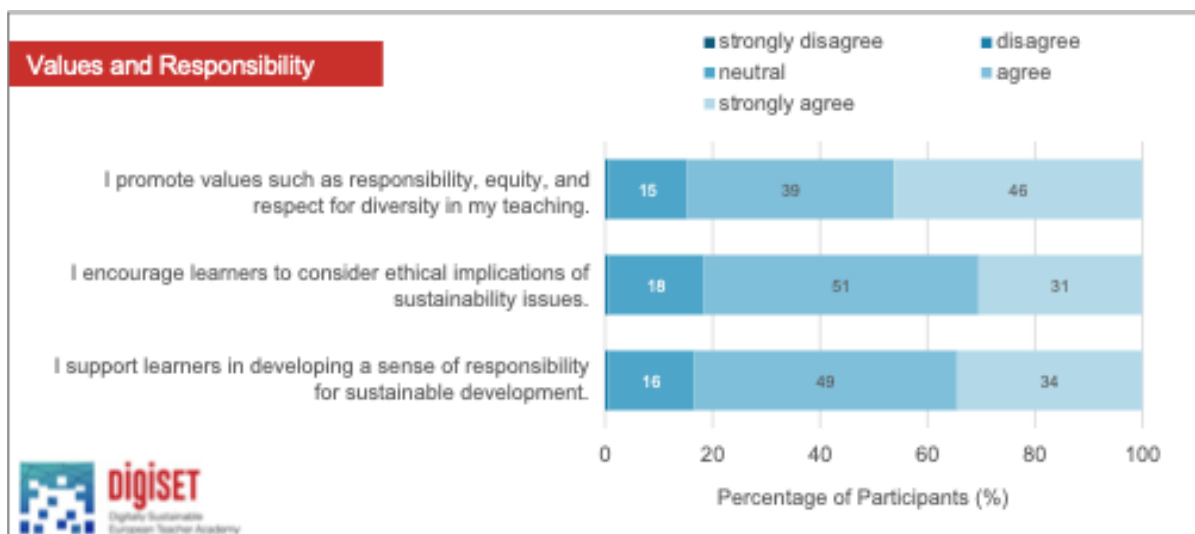


Figure 19 presents self-perceived competence in values and responsibility. Agreement was consistently high across all three items: 84.8% of respondents agreed or strongly agreed that they promote values such as responsibility, equity and respect for diversity in their teaching, 83.4% agreed or strongly agreed that they support learners in developing a sense of responsibility for sustainable development, and 81.6% agreed or strongly agreed that they encourage learners to consider the ethical implications of sustainability issues. Disagreement was negligible across all three items, indicating that values-based aspects of ESD are well internalised among the surveyed teachers.

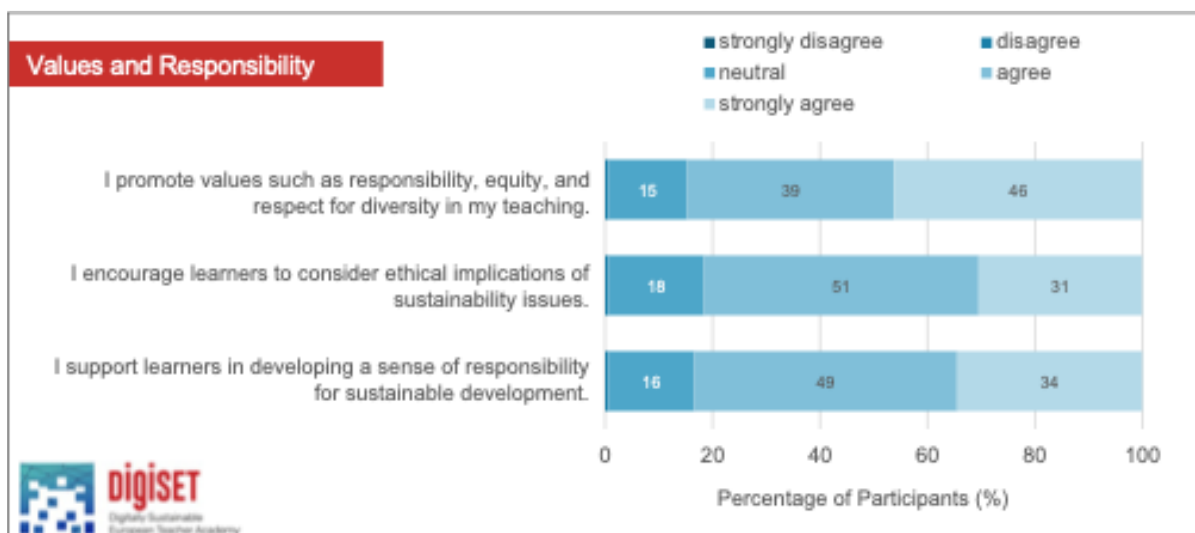


Figure 19: Self-perceived ESD competence – values and responsibility.

Note: Responses to the DigiSET teacher survey in Bulgaria, items were created for the DigiSET survey.

4.3.4. Reflective and action-oriented practice (S11-S13)

Figure 20 shows self-perceived reflective and action-oriented practice. A large majority of respondents (80.3%) agreed or strongly agreed that they reflect on their teaching practice in relation to sustainability and seek continuous improvement, and 75.1% agreed or strongly agreed that they support learners in applying sustainability knowledge to real-life situations. Confidence in facilitating discussions on complex or

controversial sustainability issues was somewhat lower, with 59.2% agreeing or strongly agreeing and 37.6% responding neutrally, suggesting that facilitation skills for contested topics may be an area for further professional development.



Figure 20: Self-perceived ESD competence – reflective and action-oriented practices.

Note: Responses to the DigiSET teacher survey in Bulgaria, items were created for the DigiSET survey.

4.4. Self-perceived Open Educational Resource (OER) competence (O1-O5)

Figure 21 presents self-perceived OER competence. Agreement levels were moderate and fairly consistent across the five items, ranging from 51.7% to 58.2% agreeing or strongly agreeing. Respondents felt most positively about their own competences and knowledge supporting their participation in or adoption of OER (58.2% agree/strongly agree) and about having the ICT skills needed to adopt and use OER (57.7% agree/strongly agree). A substantial share of respondents (around 35–42%) responded neutrally across all five items, and prior experience of using OER specifically was the item with the lowest combined agreement (52.7%), pointing to OER as an area where many teachers have only partial familiarity.

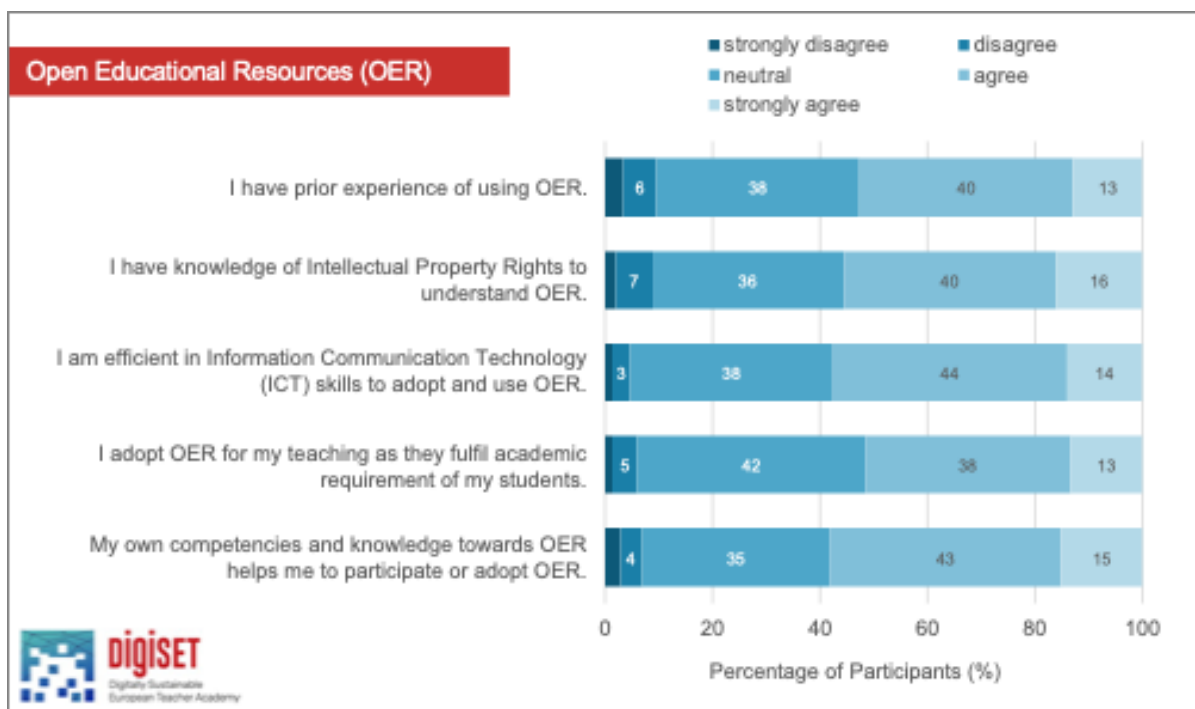


Figure 21: Self-perceived OER competence.

Note: DigiSET teacher survey results for Bulgaria, utilizing a subset of items from Mishra et al. (2016).

4.5. Self-perceived competences for specific DigiSET topics

4.5.1. Adaptive AI use (AD1, AD2)

Figure 22 shows self-perceived competence in adaptive AI use. Around three in ten respondents reported being very or completely confident in using AI tools to personalise learning for individual students (31%) or in using AI for differentiated instruction based on student needs (29.4%). Around 41% of respondents reported not being confident or only slightly confident in each of these two areas, indicating that adaptive and differentiated use of AI remains an emerging area of competence for most respondents.

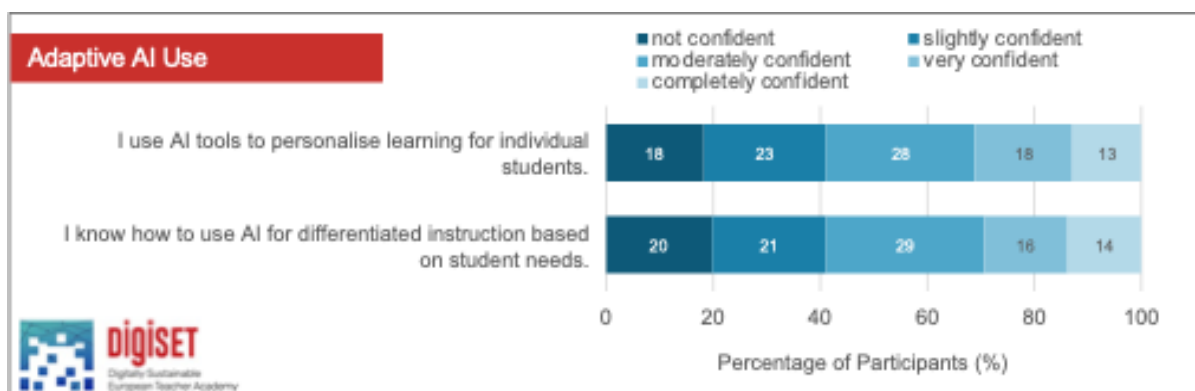


Figure 22: Adaptive AI use.

Note: Responses to the DigiSET teacher survey in Bulgaria, items were created for the DigiSET survey.

4.5.2. Gender bias in AI (GD1, GD2)

Figure 23 presents self-perceived competence regarding gender bias in AI. Confidence was limited on both items: only 26.7% of respondents felt very or completely confident being aware of gender bias in AI-generated content, and just 21.3% felt very or completely confident knowing how to address gender stereotypes when using AI in teaching. Around half of respondents reported not being confident or only slightly confident on each item (45.5% and 52.7% respectively), making gender bias in AI one of the areas with the lowest self-perceived competence in the survey.

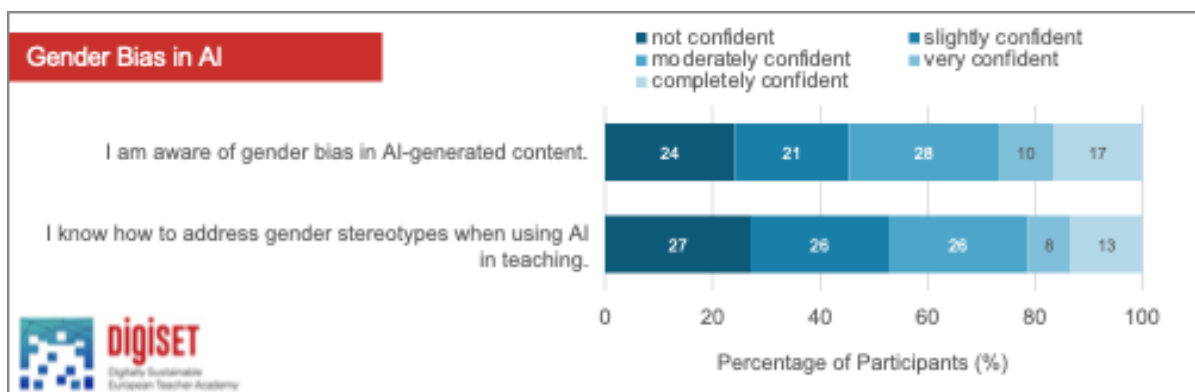


Figure 23: Gender bias in AI.

Note: Responses to the DigiSET teacher survey in Bulgaria, items were created for the DigiSET survey.

4.5.3. Inclusive practices for students with learning disabilities (I1, I2)

Figure 24 shows self-perceived inclusive digital teaching practices. Just under half of respondents reported often or always using digital tools to support students with learning difficulties (42.8%) or adapting digital learning materials for students with special educational needs (46.1%). Around 30% of respondents reported never or rarely engaging in each of these practices, suggesting that inclusive digital teaching for students with additional needs is practised unevenly across the sample.

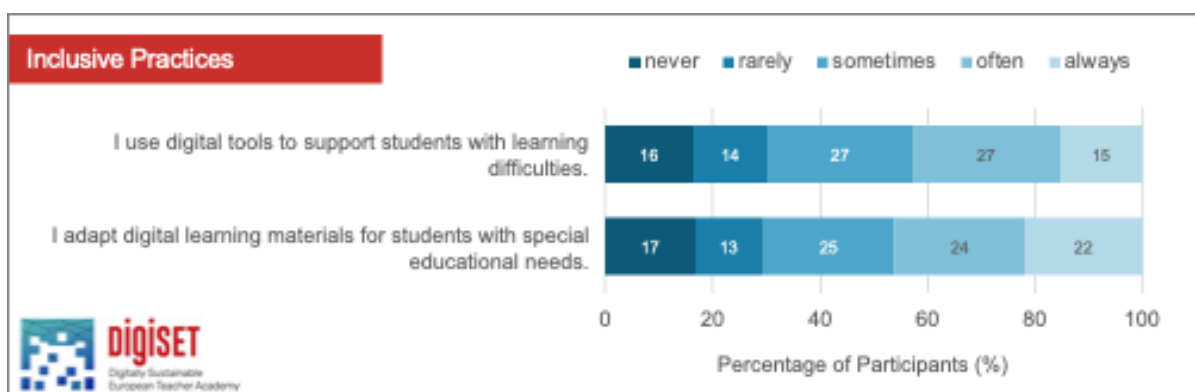


Figure 24: Inclusive practices.

Note: Responses to the DigiSET teacher survey in Bulgaria, items were created for the DigiSET survey.

4.5.4. System Thinking (S1-S3)

The following Figure 25 focuses on systems and critical thinking and presents a section of the questions relating to Education for Sustainable Development (see 4.3, p. 22ff).

Respondents reported high levels of agreement across all three items measuring systems and critical thinking: 79.5% agreed or strongly agreed that they support learners in analysing complex sustainability problems from multiple perspectives, 78.7% agreed or strongly agreed that they encourage learners to critically reflect on sustainability-related issues, and 67.5% agreed or strongly agreed that they help learners understand the interconnections between environmental, social and economic aspects of sustainability. No respondents disagreed with any of the three items, reflecting broad endorsement of systems and critical thinking as part of ESD practice.

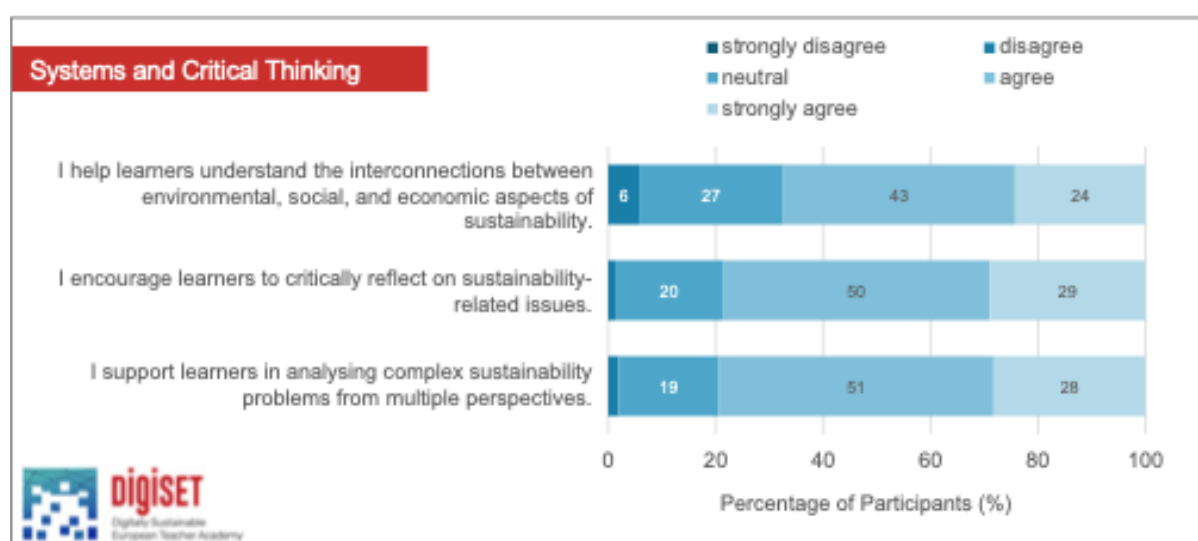


Figure 25: Education for sustainable development – systems and critical thinking.

Note: Responses to the DigiSET teacher survey in Bulgaria, items were created for the DigiSET survey.

4.6. Challenges faced in integrating digital teaching and sustainability in teaching, needed competences and existing barriers

This section focuses on teachers' faced challenge in integrating digital teaching and sustainability in teaching, professional development needs related to digital and sustainable teaching.

4.6.1. Challenges faced in integrating digital technologies and sustainability into teaching (Q1)

Analysis of the 70 responses to this open-ended question identified several recurring themes. The most frequently mentioned challenge was a lack of time - both for preparing digital and sustainability-related materials and for attending training (e.g., "lack of time for creating materials, as well as insufficient hours for exercises"; "I need more free time"). A second major theme concerned inadequate technical infrastructure, including unreliable or absent internet connectivity and outdated equipment (e.g., "weak internet in the educational institution"; "lack of access to equipment"). A third theme was the lack of relevant training opportunities, particularly

on AI and OER (e.g., “no training on AI in education, OER in education, and other topics”). Several respondents also pointed to challenges related to learner motivation and engagement, including students being distracted by personal devices or showing limited interest in analytical tasks. A smaller number of responses highlighted the specific difficulty of adapting digital and sustainability content for learners with additional needs, including Roma students and bilingual students with limited Bulgarian proficiency, and some respondents expressed concern about students' over-reliance on AI-generated answers without developing their own skills. A minority of respondents (n=2) reported facing no particular challenges.

4.6.2. Competences that would help to address these challenge (Q2)

Analysis of the 62 responses to this open-ended question also identified several recurring themes. The most prominent was a need for more practical, hands-on training grounded in real classroom examples rather than purely theoretical input (e.g., “I would like training that addresses real examples from practice, with tested ideas already proposed”; “more practical training”). A second major theme was AI-specific competences, including practical skills for using AI tools in teaching, recognising AI-generated text, and critical-thinking skills to use AI responsibly (e.g., “training in critical thinking and using AI for educational purposes”; “personal skills, technical knowledge and experience in ICT and AI”). Several respondents also identified a need for competences to work with learners from vulnerable groups or with limited proficiency in Bulgarian, including specific pedagogical approaches for these learners. Time-management skills and simply having more available time were also mentioned as prerequisites for addressing the challenges identified under Q1. A number of respondents (n≈8) indicated that the challenges they faced did not depend on their own competences, or that they did not know what would help (“this does not depend on me”; “I cannot judge”).

4.6.3. Professional development needs related to digital and sustainable teaching (P1)

Figure 26 shows the areas in which respondents felt they most needed further training (multiple responses were possible; n=146 valid responses). Using adaptive learning tools was the most frequently selected training need, chosen by half of respondents (50.7%), followed by using AI in teaching (43.8%) and ethical and responsible AI use (41.1%). Systems thinking for sustainability (32.9%), creating and sharing OER (30.1%), integrating sustainability into teaching (27.4%), and inclusive digital teaching (26%) were each selected by around a quarter to a third of respondents. Addressing gender bias in AI was the least frequently selected training need (7.5%). Only one respondent selected “Other”, indicating no need for further training.

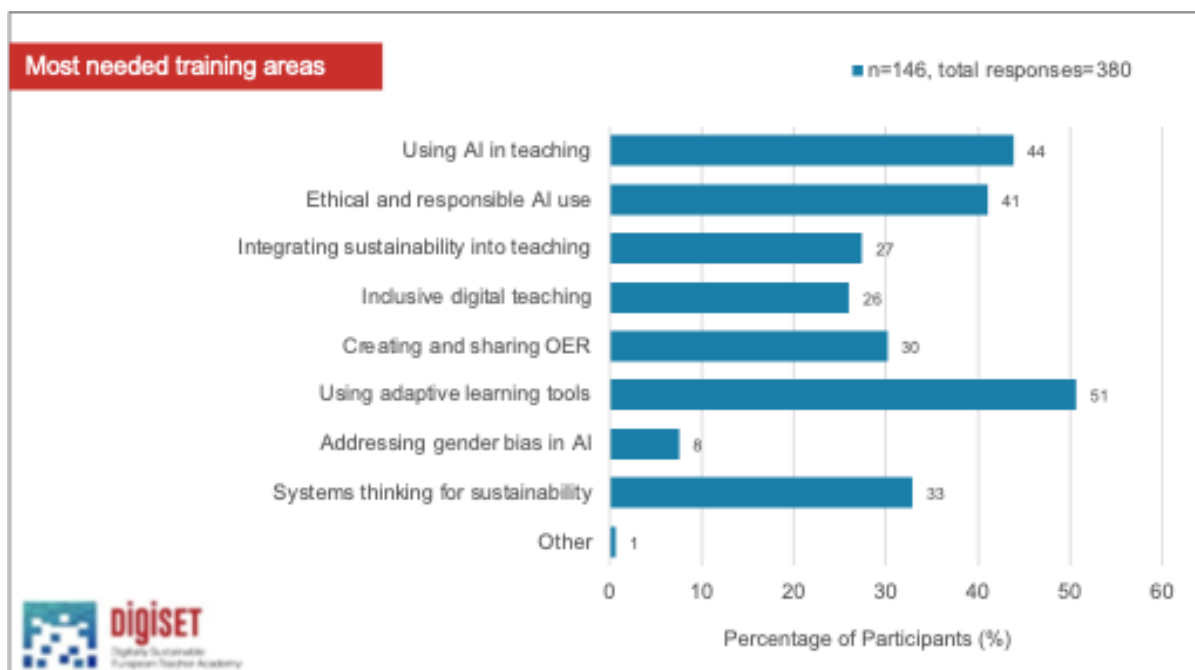


Figure 26: Most needed training areas.

Note: Responses to the DigiSET teacher survey in Bulgaria. Multiple responses were allowed; therefore, totals exceed 100%.

4.6.4. Main barriers to professional development (P2)

Figure 27 presents the main barriers respondents identified to their professional development in the areas addressed by the survey (multiple responses were possible; n=146 valid responses). Lack of time was by far the most frequently reported barrier, selected by 71.2% of respondents, consistent with the theme identified in the open-ended responses to Q1. Lack of available training (47.9%) and lack of suitable resources or materials (43.8%) were also widely reported. Lack of institutional support (26.7%) and, to a lesser extent, lack of infrastructure such as Wi-Fi or technical equipment (14.4%) were reported by smaller shares of respondents.

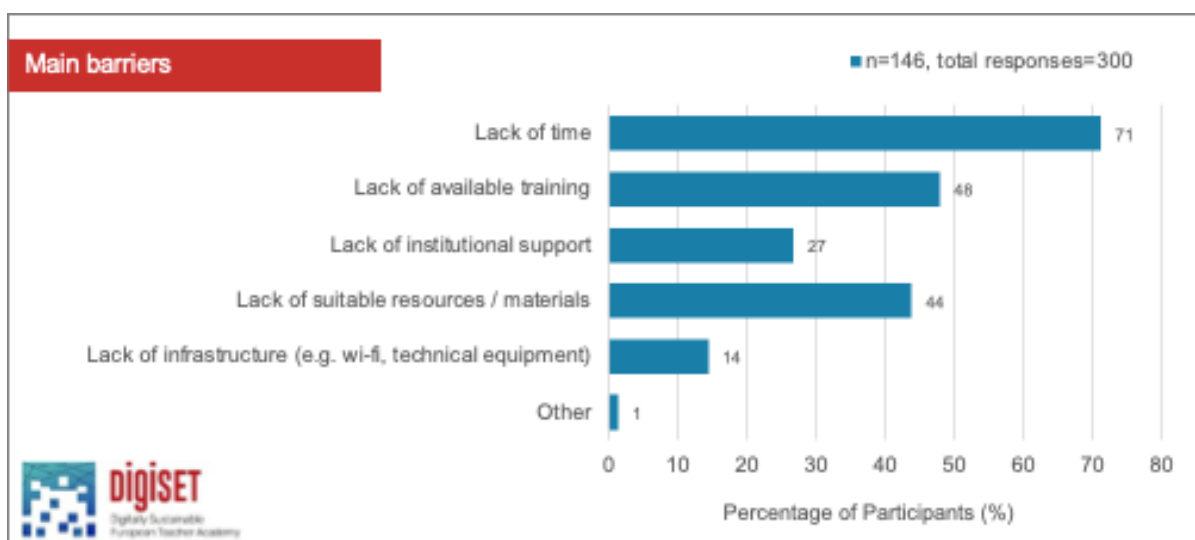


Figure 27: Main barriers to professional development in the addressed areas.

Note: Responses to the DigiSET teacher survey in Bulgaria. Multiple responses were allowed; therefore, totals exceed 100%.

4.6.5. Additional Insights and comments (if) (Q3)

Of the 64 responses to this final open-ended question, the majority (52 responses, 81%) indicated that respondents had no further comments (e.g., “no”, “none”, “thank you”). Among the remaining responses, a few respondents noted that certain survey questions were difficult to apply to their specific teaching context, such as working with Roma communities or with pre-school-aged children rather than school-aged learners. Other comments reflected on the broader importance of the initiative, with one respondent noting that “such initiatives are extremely important, as they support the adaptation of education to contemporary digital and societal changes” and calling for more practically oriented support and training. One respondent asked whether the training courses discussed in the survey would be offered free of charge, and one raised a broader concern about teachers' current readiness to guide learners' use of AI responsibly.

5. Discussion

This section synthesizes and critically discusses the key findings presented in Section 4, contextualizing them within the national educational landscape and existing research, while addressing the generalizability and limitations of the study.

5.1. Key results concerning teachers' competences

This synthesis should be read alongside the instrument-related caveats discussed in Section 5.3 (Limitations), including known response-format inconsistencies affecting some items (Keser Aschenberger et al., 2026, Section 2.8).

5.1.1. Teachers' competence in digital teaching, AI, ESD and OER

Across the four competence domains, self-perceived competence is strongest in established, communication- and values-oriented practice, and weaker wherever digital tools or AI must be actively used to personalise, assess or co-create with learners. In digital teaching, professional engagement (Figure 6, 80.6% often/always) and protecting learners' data (Figure 7, 88.7%) were rated highly, while using dedicated digital assessment tools (Figure 9, 35.3%) and practices giving learners an active, self-directed role (Figure 8, 36.1%; Figure 11, 33.1%) were rated markedly lower. A similar pattern appears for AI competence: respondents felt confident explaining what AI is (Figure 12, 59.8%), but confidence dropped sharply for AI-based assessment (Figure 14, 22–31%), for protecting sensitive content from AI tools (Figure 15, 23.4%) and for mentoring colleagues on AI use (Figure 17, 26.2%) — a clear gap between general AI awareness and applied, pedagogical use. ESD competence was the most consistently strong domain, particularly values and responsibility (Figure 19, up to 84.8%) and systems and critical thinking (Figure 25, up to 79.5%), while facilitating discussion of controversial sustainability issues (Figure 20, 59.2%) and digitally supported sustainability activities (Figure 18, around 52%) were comparatively weaker. OER competence (Figure 21) was moderate and fairly uniform (52–58%), with many neutral responses indicating only partial familiarity. Overall, teachers appear considerably more confident in awareness, values and communication than in the applied, technical and assessment-related uses of digital tools and AI.

5.1.2. Teachers' competence concerning the four DigiSET topics

Among the four DigiSET-specific topics, adaptive AI use (Figure 22) and gender bias in AI (Figure 23) show the lowest self-perceived competence in the entire survey: only 29–31% of respondents felt very or completely confident personalising or differentiating instruction with AI, and just 21–27% felt confident recognising or addressing gender bias in AI-generated content. This closely matches the low confidence reported for AI assessment and mentoring in 5.1.1, confirming that the more technically and ethically demanding uses of AI remain an emerging competence area. Inclusive digital teaching practices (Figure 24) were somewhat stronger (43–46% often/always) but still practised unevenly. Systems and critical thinking for sustainability (Figure 25), by contrast, was the strongest of the four topics (67.5–79.5% agreement), consistent with the broader strength of ESD values noted above. Adaptive AI use and gender bias in AI therefore represent the two topics with the greatest need for targeted intervention in the DigiSET Teacher Academy.

5.1.3. Teachers' learning needs and interest

The open-ended responses (4.6.1) most frequently cited lack of time, inadequate technical infrastructure and a shortage of relevant training on AI and OER as the main challenges, echoed in comments such as “I would like training that addresses real examples from practice, with tested ideas already proposed.” Desired competences (4.6.2) centred on practical AI skills and critical thinking, and on approaches for learners from vulnerable groups or with limited Bulgarian proficiency. These themes are corroborated by the closed-ended results: using adaptive learning tools (50.7%), using AI in teaching (43.8%) and ethical/responsible AI use (41.1%) were the most requested training areas (Figure 26), directly matching the competence gaps identified in 5.1.1 and 5.1.2 — although addressing gender bias in AI was requested by only 7.5% of respondents despite being an area of comparably low competence, suggesting limited awareness of this specific gap rather than its absence. Lack of time (71.2%), lack of available training (47.9%) and lack of suitable resources (43.8%) were the most reported barriers (Figure 27). For the DigiSET Teacher Academy, these results point to three concrete implications: prioritising short, practice-oriented AI and adaptive-learning modules; explicitly raising awareness of gender bias in AI as a distinct competence; and offering flexible, time-efficient training formats that address the dominant barrier of limited time.

5.2. Contextualisation within the national framework and current state of research

The results resonate closely with Bulgaria's national policy landscape. The Strategic Framework for the Development of Education, Training and Learning (2021–2030) and the 2026 Draft Vision for the Introduction and Use of Artificial Intelligence in Bulgarian School Education both prioritise digital and AI competence development (Ministry of Education and Science, 2021, 2026), which is reflected in respondents' comparatively strong general digital and AI awareness (Figures 6, 12). However, the low competence found for AI assessment, adaptive AI use and gender bias in AI (Figures 14, 22, 23) shows that this policy ambition has not yet translated into structured teacher training in these more specific areas — consistent with the country desktop research finding that adaptive learning and gender-unbiased AI remain areas without dedicated national training (Savova & Peykova, 2026). Likewise, although systems thinking is not defined as a distinct pedagogical concept

in Bulgarian policy, it is implicitly supported through Education for Sustainable Development and interdisciplinary teaching, matching teachers' comparatively high competence in this area (Figure 25). One somewhat surprising finding is the relatively high confidence in explaining what AI is (Figure 12) at this early stage of national AI-in-education policy, plausibly reflecting recent public and media attention to generative AI rather than structured training.

5.3. Limitations

This subsection addresses both the generalizability and the limitations of the findings. The gender distribution of respondents (82.96% women; Table 3) closely mirrors the national teaching workforce, in which women accounted for an estimated 84% of primary and secondary teachers in 2019 (Eurostat, 2021), suggesting the sample is broadly representative in this respect. The sample's age profile (mean = 49.5 years, median = 50; Figure 1) appears somewhat older than the wider teacher population, consistent with a national trend: 31.4% of Bulgarian schoolteachers were aged 55 or older in 2023, against an EU average of 25.1% (European Commission, 2025), which aligns with the survey's own high share of respondents with more than 20 years of experience (49.26%; Figure 5). No official sampling frame or population count for eligible (future) teachers in Bulgaria could be established, so the proportion of the eligible teacher population reached by the survey cannot be calculated; of 318 submissions received during data collection (18 May–9 June 2026), 223 were included in the analysis after excluding incomplete entries (Table 2). Because recruitment relied on convenience and snowball sampling through trade union and professional networks, respondents affiliated with these networks and working in public schools (91.18%; Figure 2) are likely overrepresented, while private-school and pre-service teachers are likely underrepresented. As with the wider DigiSET survey, all competence measures are self-reported rather than objectively tested and may be subject to social desirability bias, and the moderate sample size limits the reliability of subgroup comparisons. Instrument-related limitations identified in the methodology report (Keser Aschenberger et al., 2026, Section 2.8) — including the use of a confidence scale for some behavioural/knowledge items (notably AD1, AD2, GD1, GD2, and parts of the ESD section) and inconsistent use of “learners” and “students” — may have introduced additional measurement noise, particularly affecting the results discussed in Sections 5.1.1 and 5.1.2. No major Bulgaria-specific translation or comprehension difficulties were identified during data collection. Taken together, these sampling, self-report and instrument-related limitations mean the findings should be read as indicative of the surveyed teacher population rather than strictly representative of all (future) teachers in Bulgaria, and conclusions about precise percentages or effect sizes should be treated with appropriate caution.

6. Implications

By grounding the project design in these survey findings, DigiSET seeks to move beyond theoretical frameworks and establish a practical, evidence-based pathway for sustainable digital transformation in higher and vocational education. Building upon the teachers' survey results in Bulgaria, the following implications should influence the DigiSET project.

6.1. Implication for DigiSET

The survey findings point to three clear priorities for the DigiSET Teacher Academy in Bulgaria. First, the competence areas most in need of development are AI-based assessment (Figure 14, 22–31% very/completely confident), adaptive and personalised use of AI (Figure 22, 29–31%), gender-aware use of AI (Figure 23, 21–27%), and the more applied, technical uses of digital tools for assessment and learner self-direction (Figures 9, 11). These gaps largely align with respondents' own stated training priorities (Figure 26): adaptive learning tools (50.7%), AI in teaching (43.8%) and ethical/responsible AI use (41.1%) were the most requested areas. Gender bias in AI is the one exception — an area of comparably low competence (5.1.2) but selected by only 7.5% of respondents as a training priority (4.6.3) — and should therefore be built into the Academy curriculum proactively rather than left to demand-based needs assessment alone. Second, training design should respond directly to the barriers identified in Section 4.6.4 and the open-ended responses in 4.6.1: lack of time (71.2%) and lack of available, relevant training (47.9%) were by far the most frequently reported obstacles. This suggests the Academy should prioritise short, modular, practice-oriented formats grounded in real classroom examples — precisely what respondents requested in their open-text answers (5.1.3) — over lengthy theoretical courses, alongside flexible, self-paced delivery that can be completed alongside a full teaching workload. Third, the DigiSET Framework of Learning Outcomes (D2.2) for Bulgaria should explicitly include outcomes on: using AI tools for differentiated and personalised instruction; recognising and addressing gender bias in AI-generated content and outputs; designing and applying AI-supported assessment approaches; and translating well-established ESD values (Figure 19, up to 84.8% agreement) into concrete, digitally supported sustainability practice, an area where confidence in values clearly outpaces confidence in digital application (Figure 18, around 52%; discussed in 5.1.1).

6.2. Additional insights

For national policymakers, the findings support embedding structured, competence-framework-aligned training on AI, adaptive learning and gender-bias-aware AI use into nationally funded continuing professional development, building on existing initiatives such as the ESF+-funded STEM teacher training programme and the 2026 Draft Vision for AI in Bulgarian school education (5.2), while addressing the fragmentation and lack of needs-based design that currently characterises Bulgarian teacher CPD. For school leadership, the dominant barriers of limited time (71.2%) and limited institutional support (26.7%, Figure 27) point to concrete, low-cost actions: allocating dedicated, timetabled hours for digital and AI-related CPD, and establishing structured peer-mentoring schemes to address the low confidence teachers report in mentoring colleagues on AI use (26.2%, Figure 17). For teacher education institutions, the survey sample's older age profile (mean 49.5 years; 5.3) suggests that pre-service and early-career teachers are currently underreached by CPD in these areas. Institutions should integrate AI ethics, adaptive learning and gender-bias-aware AI literacy directly into initial teacher education curricula, rather than relying solely on in-service training to close these gaps later in teachers' careers. Two directions for future research follow from the study's limitations (5.3): first, objective or performance-based assessment of digital, AI and ESD competences, to complement and validate the self-reported measures used here; and second, targeted research on inclusive digital and AI-supported pedagogy for

learners from Roma communities and bilingual students with limited Bulgarian proficiency, a need raised repeatedly in the open-ended responses (4.6.1) but not yet addressed by a distinct policy or training strand. Regarding transferability, the strong self-perceived competence in ESD values alongside weaker digital/AI application, and the dominance of time and institutional-support barriers, likely resonate across DigiSET partner countries. However, Bulgaria's specific demographic profile — an ageing teaching workforce relative to the EU average (5.3) and a sample recruited primarily through trade union and professional networks — is more country-specific and should be read alongside the desk research and survey findings from other consortium countries before drawing consortium-wide conclusions.

References

Chiu, T. K., Ahmad, Z., & Çoban, M. (2025). Development and validation of teacher artificial intelligence (AI) competence self-efficacy (TAICS) scale. *Education and Information Technologies*, 30(5), 6667-6685. URL: <https://link.springer.com/article/10.1007/s10639-024-13094-z>

European Commission. (2025). Education and training monitor 2025 – Bulgaria. Publications Office of the European Union. <https://op.europa.eu/webpub/eac/education-and-training-monitor/en/country-reports/bulgaria.html>

Eurostat. (2021, October 5). Happy World Teachers' Day! Products Eurostat News. European Commission. <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20211005-1>

Keser Aschenberger, F.; Mair, B., Schön, S.; Ora, D.; Dulay, S., Esfer S. & Guraziu, E. (2026). Teachers' Competences for Digital Sustainability: Survey Methodology. Design, Translation and Processing of the DigiSET Teacher Survey per Country. DigiSET report (WP2), July 15, 2026. DigiSET project | Graz University of Technology. DOI: 10.3217/dyr1y-trk05

Joint Research Centre of the European Commission (n.d.). DigComEdu CheckIn . Self-reflection tool. URL: https://www.metared.org/content/dam/metared/pdf/Check_In_DigCompEdu_Self_Relection_Tool.pdf (2026-06-25)

Mishra, S., Sharma, M., Sharma, R.C., Singh, A. and Thakur, A. (2016). Development of a Scale to Measure Faculty Attitude towards Open Educational Resources. In: *Open Praxis*, 8(1), pp. 55-69. URL: <https://doi.org/10.5944/openpraxis.8.1.236>.

Ministry of Education and Science. (2021). Strategic framework for the development of education, training and learning in the Republic of Bulgaria (2021–2030). https://www.mon.bg/upload/26840/strategic_framework_2021-2030.pdf

Ministry of Education and Science. (2026). Draft vision for the introduction and use of artificial intelligence in Bulgarian school education. <https://nova.bg/news/view/2026/01/28/525394/>

Savova, A., & Peykova, D. (2026). Teacher competences for sustainable digital literacy: National context, policies, and professional development. Bulgaria. DigiSET project, WP2 Country Desktop Research Report (internal project deliverable).