

IDEAL

Integrating Data Analysis and AI in Learning Experiences

D5.2

Implementation Strategy Report

Work Package 5: Implementation Strategy

Prepared by

Pompeu Fabra University

June 2026

Co-Funded by
the Erasmus+ Programme of
the European Union

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 of the National Agency Erasmus+ – INDIRE. Neither the European Union nor the granting authority can be held responsible for them. Project Number: 2024-1-IT02-KA220-HED-000251425

Executive Summary **4**

1. Introduction **5**

1.1 Purpose and scope of the Deliverable 5

1.2 The IDEAL project in brief 5

1.3 The IDEAL course offering 5

1.4 The IDEAL competence framework 5

1.5 Structure of the document 6

2. Lessons from the Pilots **6**

2.1 GERMANY: University of Applied Sciences Ruhr West 6

2.1.1 WHAT HAPPENED 6

2.1.2 WHAT WORKED WELL 7

2.1.3 CHALLENGES 7

2.1.4 KEY TAKEAWAYS 8

2.2 GERMANY: Q21 Agency for Qualification and Transfer Management Ltd 8

2.2.1 WHAT HAPPENED 8

2.2.2 WHAT WORKED WELL 8

2.2.3 CHALLENGES 8

2.2.4 KEY TAKEAWAYS 9

2.3 GREECE: Aristotle University of Thessaloniki 9

2.3.1 WHAT HAPPENED 9

2.3.2 WHAT WORKED WELL 9

2.3.3 CHALLENGES 9

2.3.4 KEY TAKEAWAYS 9

2.4 ITALY: National Research Council of Italy 10

2.4.1 WHAT HAPPENED 10

2.4.2 WHAT WORKED WELL 10

2.4.3 CHALLENGES 10

2.4.4 KEY TAKEAWAYS 10

2.5 ITALY: University of Milano-Bicocca 10

2.5.1 WHAT HAPPENED 10

2.5.2 WHAT WORKED WELL 12

2.5.3 CHALLENGES 12

2.5.4 KEY TAKEAWAYS 13

2.6 ITALY: Smart Revolution Srl 13

2.6.1 WHAT HAPPENED 13

2.6.2 WHAT WORKED WELL 13

2.6.3 CHALLENGES 14

2.6.4 KEY TAKEAWAYS 14

2.7 SPAIN: Pompeu Fabra University 14
2.7.1 WHAT HAPPENED 14
2.7.2 WHAT WORKED WELL 14
2.7.3 CHALLENGES 15
2.7.4 KEY TAKEAWAYS 15
3. Recommendations for success 16
3.1 Practical do's and don'ts 16
3.2 Tips for motivating participants to engage with training 18
4. Beyond the pilot: future opportunities 19
4.1 Scaling and valorisation 19
4.2 Looking ahead 20
5. Conclusion 21

Executive Summary

IDEAL (Integrating Data Analysis and AI in Learning experiences) is a 24 month Erasmus+ Cooperation Partnership in Higher Education (KA220-HED) that spans from October 2024 to September 2026. The consortium consists of seven partners from four countries: National Research Council of Italy (CNR, Italy), University of Milan-Bicocca (Italy), University of Applied Sciences Ruhr West (Germany), Pompeu Fabra University (Spain), Aristotle University of Thessaloniki (Greece), Q21 - Agency for Qualification and Transfer Management Ltd (Germany) and Smart Revolution Srl (Italy).

The project aimed at strengthening the capacity of European higher education institutions to integrate Data Analysis and the responsible use of Artificial Intelligence (AI) into teaching and learning. The project sought to broaden access to knowledge and skills related to Data Analysis and AI use among educators across a wide range of academic disciplines, thereby creating opportunities for applying them effectively in their own teaching and learning situations rather than restricting them to technology-focused fields. To this end, the project developed (a) a comprehensive curriculum and educational resources focusing on Data Analysis and AI; (b) a competency framework for Data Analysis and AI; (c) a blended learning environment, all designed as openly licensed resources that institutions can reuse and adapt beyond the project's lifetime; (d) conducted pilot programs in different European higher education institutions.

This deliverable summarises the pilot experiences of the IDEAL project and sets out a strategy for implementing the IDEAL approach at scale. Each consortium partner conducted a pilot and reported on their experience of applying the approach in their own context. Drawing on these reports, the deliverable presents key insights and a set of practical dos and don'ts to help institutions apply the IDEAL approach effectively. In doing so, it shows how teachers, students, researchers and other stakeholders can be prepared for the responsible use of artificial intelligence in higher education. More broadly, the IDEAL project offers a practical, evidence-informed approach to integrating data analysis and AI competences into teaching, learning and professional development across European higher education.

1. Introduction

1.1 Purpose and scope of the Deliverable

This deliverable presents the Implementation Strategy Report, developed within Work Package 5 of the IDEAL project. Its purpose is to document the pilots implemented by the consortium partners, describing the activities conducted, the approaches adopted in each context, and the key results achieved. The report also serves as a basis for assessing the transferability of the pilot experiences and for guiding future implementation beyond the project's lifetime.

1.2 The IDEAL project in brief

IDEAL – Integrating Data Analysis and AI in Learning Experiences – is a two-year Cooperation Partnership in Higher Education (Erasmus+ KA220-HED), running from 1 October 2024 to 30 September 2026 and coordinated by the Consiglio Nazionale delle Ricerche (CNR). The project aims to foster the integration of data analysis and artificial intelligence within higher education, bridging existing gaps and empowering educators and students with advanced digital competences.

The partnership brings together CNR (Italy), Aristotle University of Thessaloniki (Greece), Università degli Studi di Milano-Bicocca (Italy), Smart Revolution (Italy), Q21 – Agentur für Qualifizierung und Transfer management (Germany), Pompeu Fabra University (Spain) and Hochschule Ruhr West (Germany). Activities are organised in five Work Packages: WP1 Project Management; WP2 Use case Inventory for AI and Data Analysis in Higher Education and Competence Framework; WP3 Blended Learning Offer; WP4 IDEAL Learning Suite; WP5 Implementation Strategy.

1.3 The IDEAL course offering

IDEAL offers a blended-learning course designed to help higher-education teachers integrate Data Analysis and AI into their disciplines. Rather than a single fixed course, it offers flexible learning modules that can be adapted to different starting points, disciplines, and institutional contexts. All content is delivered through the IDEAL Learning Suite, an integrated platform built around a Moodle-based learning management system. Course topics include: *Ethical Use of GenAI in Higher Education; Bias & Fairness of GenAI; Frameworks and Competencies; Broader Impact and Institutional Perspectives; Responsible Use of AI and Stakeholder Perceptions and Critical Literacy.* Each course outlines its learning goals and the competencies it addresses.

1.4 The IDEAL competence framework

The IDEAL Competence Framework is organised into four main competence types: *Pedagogical-AI Integration; AI-Enhanced Curriculum Design and Assessment; Ethical, Inclusive, and Data-Literate AI use*, and *AI-Driven Professional Development and Collaboration*. Each type encompasses five core competences, and each core competence is further broken down into two sub-competences, leading to a total of 40 sub-competences. Overall, the framework comprises 20 competences and 40 sub-

competences. The framework aims to equip European higher education teaching staff with the competences needed to integrate AI technologies critically, ethically, and effectively into teaching, learning, and professional practice.

LEVEL5 Assessment. Every competence is elaborated with reference to the LEVEL5 Assessment, which provides a three-dimensional model (cognitive, activity, and affective) and a five-stage developmental model across Knowledge, Skills, and Attitudes. Indicators are evaluated along five quality levels, from beginner (1) to expert (5), within each associated competence taxonomy.

SPIDER questionnaire. A self-assessment tool completed at the start of the IDEAL course. By rating themselves across competence areas, participants obtain a spider (radar) chart profile that highlights their strengths and the areas they most need to develop. This provides a baseline that helps each participant to tailor their own learning paths according to their needs.

To ensure the IDEAL approach was grounded in authentic teaching practice rather than general recommendations, each partner conducted one or more local pilots in their own higher education context. This resulted in pilots across four European countries including Italy, Germany, Spain, and Greece spanning a range of disciplines, institutional cultures, and levels of data and AI readiness. Each pilot was documented in an experience report describing the activities delivered, AI tools used, participant feedback, and recommendations.

1.5 Structure of the document

The document covers the lessons learned from the pilots carried out by each consortium partner, followed by recommendations for successful implementation and an outlook on future opportunities beyond the pilots.

2. Lessons from the Pilots

Ten pilots were conducted across four countries applying or based on the inspiration from the IDEAL blended offer in authentic settings in higher education.

2.1 GERMANY: University of Applied Sciences Ruhr West

2.1.1 WHAT HAPPENED

The pilot consisted of two separate rounds involving students from computer science-related degree programs. Round 1 involved 5 students (3 male, 2 female) from two Master's programs (Human-Computer Interaction M.Sc. and Computer Science M.Sc.), while Round 2 involved 15 students (9 male, 6 female) from three Bachelor's programs (Human-Computer Interaction B.Sc., Applied

Computer Science B.Sc., and E-Commerce B.Sc.). Both rounds were embedded as part of existing Bachelor's and Master's modules, with students receiving course credit for participation. Students were given access to the IDEAL learning platform and asked to work through various topics and content. In Round 1, students took part in semi-structured interviews about their experience with the course structure and content, which were recorded and transcribed for analysis. In Round 2, students completed the SPIDER competence questionnaire both before and after engaging with the course topics to measure any changes in their competences.

2.1.2 WHAT WORKED WELL

- **Measurable impact on competences:** Comparing pre- and post-course SPIDER results showed an upward trend for most participants, particularly in awareness of rules/regulations and ethical considerations even after short exposure. For a few participants, the bias and fairness dimension moved from basic awareness to a certain level of deep knowledge.
- **Positive evaluation of the IDEAL platform and materials:** Overall, the IDEAL platform, its materials, and topics were perceived as highly relevant and well aligned with the stated learning objectives, especially regarding ethics, bias-fairness, and governance. In general, participants viewed the course materials that also used different visual elements positively and found the topics highly relevant and interesting. Participants appreciated the learning objectives mentioned at the beginning of the course and mentioned goals are aligned well with the actual content.
- **Credit-bearing integration ensured participation:** Embedding the pilot within existing course modules, with course credit attached, ensured reliable student engagement across both rounds.

2.1.3 CHALLENGES

- **Reading-heavy materials reduced efficiency:** Extensive use of long academic papers and lack of practical examples in the course were viewed negatively by participants. Participant feedback can be taken as useful feedback for future restructuring of the course, including shorter summaries, different (self-)guided learning paths, more visuals, and more practice.
- **English-language barrier:** Lengthy English papers required significant effort for participants. Several informally used AI tools (ChatGPT, Copilot, DeepL) to translate and summarize content. It may have improved accessibility but may have risked superficial learning and uneven support.
- **Limited measurable competence change:** Because the course was embedded within a broader module rather than run as its own unit, short exposure constrained the observable impact. A multi-week embedding would likely provide stronger effects in future iterations.
- **Gap between awareness and application:** Participants repeatedly wanted more concrete teaching examples and implementation guidance; this was acknowledged as a key design priority for future rounds through case studies, templates, and step-by-step scenarios.

2.1.4 KEY TAKEAWAYS

The IDEAL platform and its materials were seen as highly relevant and well-aligned with learning objectives, especially around ethics, bias/fairness, and AI governance, and even brief exposure produced a positive shift in relevant competences suggesting strong "quick impact" potential. However, the pilot revealed that the course currently leans more toward building awareness and critical reflection than toward equipping participants with hands-on, classroom-ready skills. A shift from "reading-heavy knowledge" toward more actionable teaching practice such as case studies, step-by-step guidance, structured summaries, quizzes, practical templates, and differentiated learning tracks for educators versus students alongside clearer guidance on responsible and legally sound AI tool use is required. Participants also stressed that AI should be treated as a tool rather than a replacement for humans, that student AI literacy needs to be strengthened, and that institutions need clear guidelines, including transparent AI policies, critical reflection, process-oriented and oral exams, and an expectation that educators actively teach students how to use AI responsibly.

2.2 GERMANY: Q21 Agency for Qualification and Transfer Management Ltd.

2.2.1 WHAT HAPPENED

The pilot was conducted in cooperation with BUPNET as part of an existing Continuous Professional Development (CPD) course on Project Management. The course offers a practical internship component to support employability and career transitions for university students who seek additional professional development in project management. The pilot consisted of two phases: a trainer preparation session and a participant training session. The first one consisted of an introduction to AI tools, a discussion of opportunities and limitations, and an exploration of prompting strategies. The second session focused on hands-on experience, with a workshop and reflection on the responsible use of AI in professional contexts. The pilot was inspired by the IDEAL approach to AI, which combines AI literacy, critical reflection, practical experimentation, and responsible use of AI tools.

2.2.2 WHAT WORKED WELL

- **Awareness of AI-supported workflows:** The activity promoted awareness of AI-supported workflows within a professional learning environment.
- **Participants' engagement:** Participants engaged in discussions about AI opportunities, limitations, employability, ethical considerations, data protection requirements, and future workplace implications.

2.2.3 CHALLENGES

Limited time available: Participants repeatedly expressed interest in exploring tools and workflows in greater depth.

2.2.4 KEY TAKEAWAYS

The pilot highlighted the opportunities and challenges of integrating AI into established educational programs by developing strategic understanding of prompting, workflow design, tool selection, critical evaluation, and responsible AI use.

2.3 GREECE: Aristotle University of Thessaloniki

2.3.1 WHAT HAPPENED

Aristotle University of Thessaloniki (AUTH) conducted the Greek pilot from 9 February to 22 May 2026 as part of the Spring Semester 2025–2026 undergraduate course P1808 – Design and Evaluation of Vocational Training Programs. The primary objective was to evaluate the integration of the IDEAL methodology within a Greek higher education setting, utilizing a combination of protocol-led design assignments and structured digital learning resources. In particular, the study investigated students' capacity to interact critically with AI-focused educational materials and to successfully adapt them into ethically sound, pedagogically robust, and logically structured thematic units suitable for the university level.

2.3.2 WHAT WORKED WELL

- **Insights for IDEAL learning material:** The pilot generated pedagogical products and implementation insights for IDEAL learning materials, collaborative design of structured thematic units on responsible AI use in higher education, and reflective evidence on the feasibility and pedagogical value of the IDEAL approach in a Greek higher education course context.
- **Engagement:** Students demonstrated engagement with key elements, including pedagogical purpose, learning outcomes, AI-supported learning activities, ethical and risk-aware design, transparency in AI use, and assessment alignment.
- **Scenario-based thematic-unit designs:** Completion of 10 scenario-based thematic-unit designs, each produced by a group and developed according to the common protocol, targeting students, teaching and administrative staff**.**

2.3.3 CHALLENGES

- **Selection of relevant IDEAL resources:** The groups encountered difficulties, including selecting the most relevant resources from the IDEAL platform. The educator narrowed the scope of the thematic unit, maintaining coherence across group-produced sections, and distinguishing between legitimate AI-supported assistance and excessive reliance on AI-generated outputs.

2.3.4 KEY TAKEAWAYS

The internal pilot showed that the IDEAL approach can be implemented productively in a course-based higher education setting when online project materials are combined with a clearly structured pedagogical protocol.

2.4 ITALY: National Research Council of Italy

2.4.1 WHAT HAPPENED

The pilot was conducted in the Data Visualization (DATAVIZ) course offered to postgraduate students enrolled in the Data Science and the Theory and Techniques of Complex Systems (TTC) Master's programs at the Università degli Studi di Milano-Bicocca (UNIMIB), Italy, with 3 sessions between January and June of 2026. The students were required to produce a data visualization project on a topic of their choice. The assessment brief explicitly required students to include a methodology section documenting all tools used, including AI tools, as part of the reproducibility requirements. In particular, the aim of the pilot was to determine whether an explicit AI disclosure requirement within the assessment structure would yield measurable, systematic documentation of students' use of AI. Also, to understand the pattern of AI tool adoption in a technically advanced student cohort.

2.4.2 WHAT WORKED WELL

- **Explicit AI disclosure requirement:** In the pilot, the AI disclosure, as a formal requirement in the assessment structure, reliably produced systematic documentation and showed that pedagogical design is the dominant driver of disclosure behavior.
- **AI Tools used in postgraduate context:** With the pilot, it was possible to achieve a measurable, documented rate of AI tool disclosure that exceeded those observed in prior studies and to characterize the functional patterns of AI use in a postgraduate data science context.

2.4.3 CHALLENGES

- **Non-disclosure of AI use:** 32.7% of students did not disclose, despite the formal requirement, making it impossible to determine whether it was non-AI use or an omission of AI use.
- **Submissions file type:** Some submissions were image-based or scanned, which implies that text extracted from these files was partial, and AI mentions in these documents may be undercounted.

2.4.4 KEY TAKEAWAYS

AI disclosure requirements help increase compliance rates and produce documentation about students' use of AI systems.

2.5 ITALY: University of Milano-Bicocca

2.5.1 WHAT HAPPENED

Between March and May 2026, the University of Milano-Bicocca (Italy) conducted a series of four pilot workshops integrating IDEAL project materials on the "Responsible Use of AI" into different master's-level courses. Each pilot combined a facilitator-led presentation on responsible AI use, LLM limitations, and critical prompting with a hands-on activity using Wisely, a task-agnostic AI prompt-coaching chatbot, though the scale, focus, and format varied by course.

Pilot 1:

The pilot was conducted on 6 March 2026 as a single two-hour laboratory activity within the course *AI and Organizational Development*, offered in English as part of the inter-university Human-Centered Artificial Intelligence joint master's programme. Four master's-level students (3 male, 1 female) participated as the target group. Beforehand, the facilitator selected IDEAL "Responsible use of AI" materials from Topic 5 and prepared a presentation on AI, LLMs, and their limitations, including sycophancy, overreliance, and critical prompting guidelines. The session ran in three parts: an introduction presenting the core IDEAL concepts; a hands-on activity in which students individually used the Wisely chatbot (a task-agnostic AI prompt coach) to develop and refine prompts for an organizational analysis task (designing a mentoring programme for Niguarda Hospital), then completed the task as a group of four, and a wrap-up discussion on the reliability, usefulness, and limitations of AI-supported information sources when preparing for organizational consulting.

Pilot 2:

The pilot was conducted as a workshop embedded in the course Elements of Human-Technology Interaction using IDEAL material on Responsible AI. On 12th March 2026, a one-hour workshop session was held, featuring a presentation and discussion on responsible AI use and bias/fairness concepts, followed by hands-on testing of the Wisely chatbot. The aim of the pilot was to introduce responsible and effective use of generative AI in higher education and also to test how a task-agnostic AI prompt can support students.

Pilot 3:

The pilot was conducted on 21 April 2026 as a two-hour workshop and in-class activity within the course *Human Resources Management and Development*, delivered in Italian to 33 master's students. The students had a non-technical background. Students first completed a pre-questionnaire on prompting self-efficacy and the perceived usefulness of generative AI chatbots. The session itself combined a facilitator-led presentation on responsible AI use, LLM limitations, sycophancy, overreliance, and critical prompting, followed by an applied group activity using the Wisely chatbot. During the task, students took on the role of an HR manager in a banking-sector consulting firm preparing for an evaluation interview with a difficult employee. They explored the scenario individually or in groups, but completed the final product collaboratively in groups of three or four. Afterward, students completed a post-questionnaire on prompting self-efficacy and perceived usefulness, plus two open-ended questions about the chatbot and the activity.

Pilot 4:

The pilot took place in the context of the School Management course and was integrated into a workshop and an in-class activity for master's students on 15 May 2026 and lasted 2 hours. A facilitator led a presentation introducing topics on the responsible use of AI from the IDEAL project. Then, students completed a group-based in-class activity using the Wisely chatbot. The workshop was in Italian and covered AI and LLM foundations, limitations, sycophancy, overreliance, and critical prompting. The students performed the activity without the use of AI, then with the use of Wisely, revising their work with chatbot-supported prompt feedback.

2.5.2 WHAT WORKED WELL

- **Small group enabled close facilitation:** The group of four allowed for close facilitation and rich discussion throughout the session.
- **The two-hour blended format was well-suited:** Splitting the session into an hour of responsible-AI concept introduction followed by an hour of immediate hands-on application gave students a practical way to apply what they had just learned.
- **Wisely chatbot made responsible prompting actionable:** The chatbot provided real-time, structured feedback on prompts, turning the responsible prompting framework into a concrete, usable skill involving clarity, context, constraints, and critical evaluation — and supported independent learning without the facilitator needing to review every prompt.
- **Authentic scenario connected AI literacy to practice:** Realistic organizational tasks pushed students to reflect on what information is needed, how to obtain it ethically, and how AI should assist without replacing professional judgment.
- **Students engaged critically rather than passively:** Rather than accepting the chatbot's output uncritically, students evaluated its suggestions, selected what was useful, and adapted responses to the organizational context.
- **Improvement in students' awareness of responsible AI use:** Students learned about the topic, recognized key risks associated with generative AI, and gained practical experience with prompt coaching through Wisely.

2.5.3 CHALLENGES

- **Technical access to Wisely:** The tool could only be reached via the university Wi-Fi. The facilitator handled this by instructing students to connect to the university network and proceed through the warning using the accept-risk option. For future pilots, a trusted certificate is recommended.
- **Reduced confidence from the certificate warning:** The warning screen may have lowered some participants' trust in the tool and created a small barrier at the start of the activity. Resolving the certificate issue before scaling to larger groups is essential.
- **Documenting prompt improvement:** To better evidence how Wisely supports learning, the facilitators recommend collecting examples of students' initial and revised prompts (with consent) in future runs, documenting the tool's effect on prompt quality and metacognitive awareness.

- **Feedback is sometimes too broad or superficial:** Some students found the chatbot's feedback overly general or focused on information they did not have, such as specific company policies or role details. This was treated as pedagogically useful, highlighting the need for students to understand the context, boundaries, and relevance of AI suggestions.
- **Questions from non-technical students:** Because some students were not from a technical background, some asked which AI models the facilitators recommended; this was handled within the facilitation and did not prevent completion of the activity.

2.5.4 KEY TAKEAWAYS

The pilot showed that IDEAL materials on responsible AI can be used in a short, applied higher education laboratory session. A combination of concept introduction and hands-on prompt coaching provided students a practical way to examine AI use in relation to a realistic problem. A key strength of the IDEAL approach here was that it framed AI use as a critical, reflective, and responsible process rather than a purely technical skill.

2.6 ITALY: Smart Revolution Srl.

2.6.1 WHAT HAPPENED

The pilot was carried out by SMART at the University of Turin in Italy and involved 58 participants drawn from the university's technical and administrative staff. Each department was asked to register up to five staff members, based on individual interest and relevance to their work. Of the 58 participants, 44 were female and 14 were male, aged between 25 and 55. All held university degrees and worked either in research and innovation support or in general university management. The timeline for planning and delivering the pilot spanned January to May 2026. The pilot was also linked to the IDEAL Datathon on 21 May, which participants were invited to attend as a hands-on follow-up experience.

2.6.2 WHAT WORKED WELL

- **Learning offer tailored to the institution's context:** Over four months, the team held several online meetings with the organizing office and surveyed participants about their daily tasks, known tools, and competence levels, then built all examples, scenarios, datasets, and exercises around that information.
- **Motivated, well-matched participants:** Because participants were selected based on personal and professional interest and on roles where AI and data skills would bring real benefit, motivation was high and they could apply new skills immediately.
- **Training paired with a practical Datathon:** Matching the workshop with a challenge-driven Datathon the following day let participants immediately apply their new tools and knowledge in a real-world scenario, and the design-thinking approach boosted curiosity, motivation, and engagement.

- **SPIDER enabled quick self-assessment:** The SPIDER questionnaire gave participants a fast, immediate way to self-assess their new competences, making them more aware and conscious of their own learning progress.
- **Measurable competence gains:** Of the 47 participants who completed the SPIDER questionnaire (25 of whom consented to share their data), participants showed a measurable increase in self-assessed competence, particularly in AI awareness, data literacy fundamentals, and critical evaluation of AI outputs.

2.6.3 CHALLENGES

- **Minor AI tool reliability issues:** Some AI tools took too long to produce results or did not work properly during the live demonstrations. These were easily managed thanks to a well-planned structure and pre-tested results that were ready to use as backups.

2.6.4 KEY TAKEAWAYS

The pilot demonstrated the overall effectiveness of the IDEAL approach, with high participant engagement confirming both the relevance of the topics and the suitability of the methodology, and strong group work during the Datathon showing that participants could apply their new skills in practice. A key contribution was addressing a real institutional gap: while data analysis and AI are seen as highly relevant, existing training had been fragmented and tool-specific, whereas the IDEAL methodology offered a more structured, integrated, and competence-driven experience. The pilot also confirmed the value of extending data literacy and responsible AI training beyond teaching staff to the wider higher education workforce, and validated the SPIDER questionnaire as an effective instrument for competence-oriented learning within a short training window. The main lessons for future iterations are that an initial needs survey is essential for tailoring content to participants' real context, and that a design-thinking, challenge-based activity strongly drives engagement with a note to allow more time for audience questions and for groups to present their conclusions and receive lecturer feedback.

2.7 SPAIN: Pompeu Fabra University

2.7.1 WHAT HAPPENED

The pilot was implemented within a first-year Physics course offered as part of the Bachelor's Degrees in Telecommunications Engineering and Computational Audiovisual Engineering. The pilot was conducted throughout the third trimester of the 2025-2026 academic year. The pilot consisted of five practical sessions that used an AI tool called *Lantern*, which assisted students during the course's practical sessions, or students could use the tool during their autonomous study time to ask course-related questions. The teacher who conducted the Pilot took inspiration from the IDEAL course training.

2.7.2 WHAT WORKED WELL

- **Reflective professional development:** Throughout the iterative refinement of the prompt to be used with the AI tool, teachers reflected on the use of AI in their classrooms.
- **Socratic tutoring enhanced students' reasoning:** Socratic tutoring approach supported students' reasoning by encouraging reflection rather than providing direct answers.

2.7.3 CHALLENGES

- **AI asked too many questions:** While the chatbot was intentionally designed to guide students through a sequence of questions and encourage independent reasoning, many students preferred to receive direct answers immediately rather than engage in a guided problem-solving process. The educator reflected on the importance of a Socratic approach and encouraged students to engage with the Socratic tutor.
- **Inappropriate AI use:** Students copied course materials directly into the chat and requested complete answers rather than seeking support in their learning process. The educator reinforced the importance of providing guidance on effective and responsible AI use.

2.7.4 KEY TAKEAWAYS

The Spanish pilot confirmed the importance of prompt-engineering skills for both students and instructors, showing that effective interaction with AI systems requires dedicated support and training.

3. Recommendations for success

Based on our experience from the pilot projects, we derived a set of practical do's and don'ts to help implement the IDEAL approach effectively. The following recommendations reflect the lessons learned and can support future implementation.

3.1 Practical do's and don'ts

DO

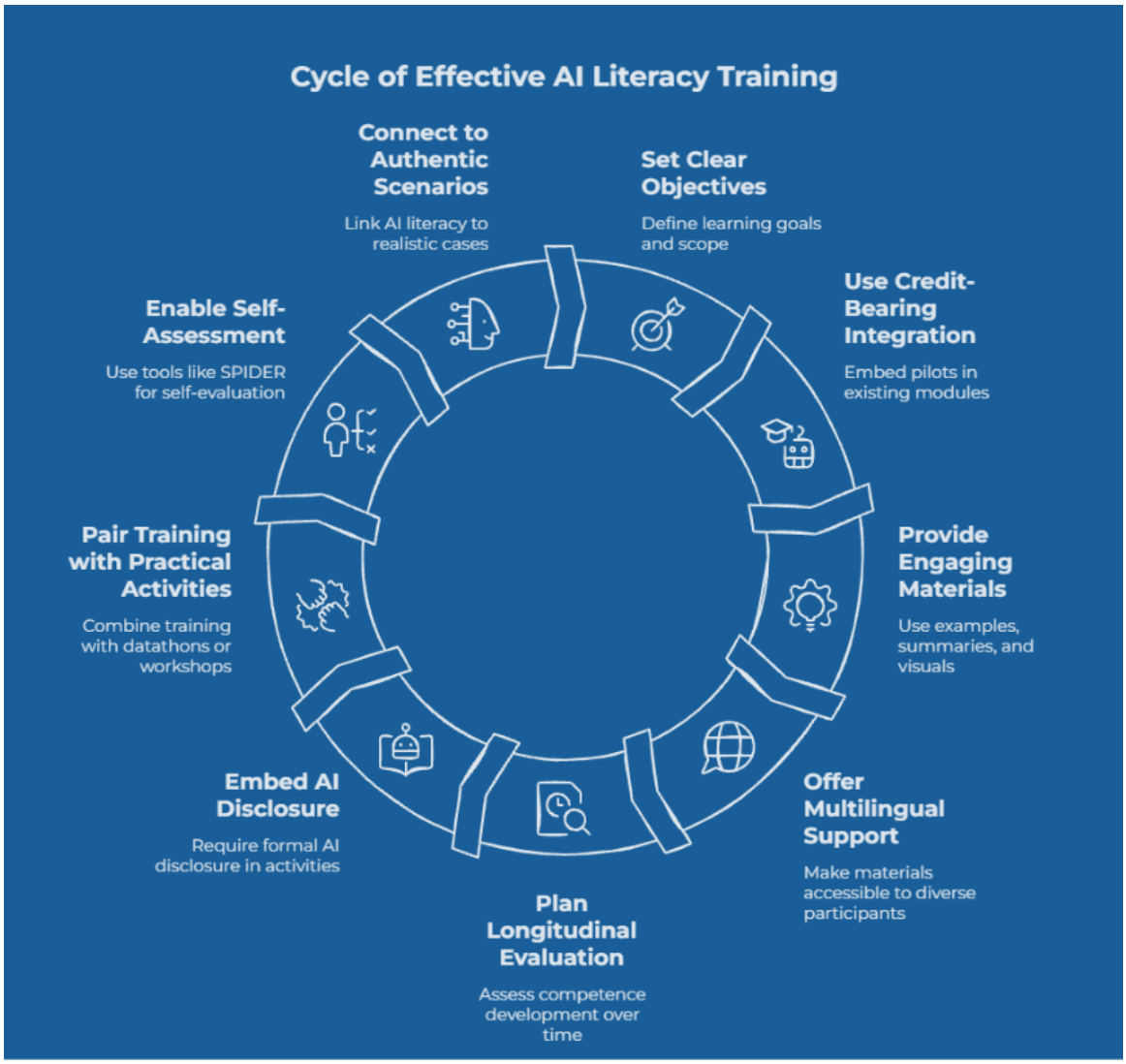


Figure 1: Cycle of effective AI literacy training.

- **Set clear objectives and scope.** Clearly defined objectives help participants understand what they will learn and achieve. Define each activity's scope and select relevant materials accordingly.

- **Use credit-bearing integration.** Embedding pilots within existing modules, with course credit attached, secured reliable engagement with the materials.
- **Provide examples, summaries, and visuals.** Participants valued practical examples of AI in teaching over lengthy papers. Include concise summaries and more visuals to keep materials engaging.
- **Offer materials in multiple languages.** Providing materials in several languages improves accessibility for participants from diverse backgrounds.
- **Plan longitudinal evaluation.** The pilots were short, which limited assessment of competence development. Multi-week embedding would likely produce stronger effects.
- **AI disclosure.** Embed AI disclosure as a formal assessment requirement within activities.
- **Pair training with a datathon or workshop.** Combining training with practical activities helps participants apply new tools and knowledge, even in real-world scenarios.
- **Enable quick self-assessment with SPIDER.** SPIDER gives participants a fast way to self-assess their competences and become aware of their own progress.
- **Connect AI literacy to authentic scenarios.** Realistic cases encourage participants to think critically about the responsible use of AI.

DONT'S

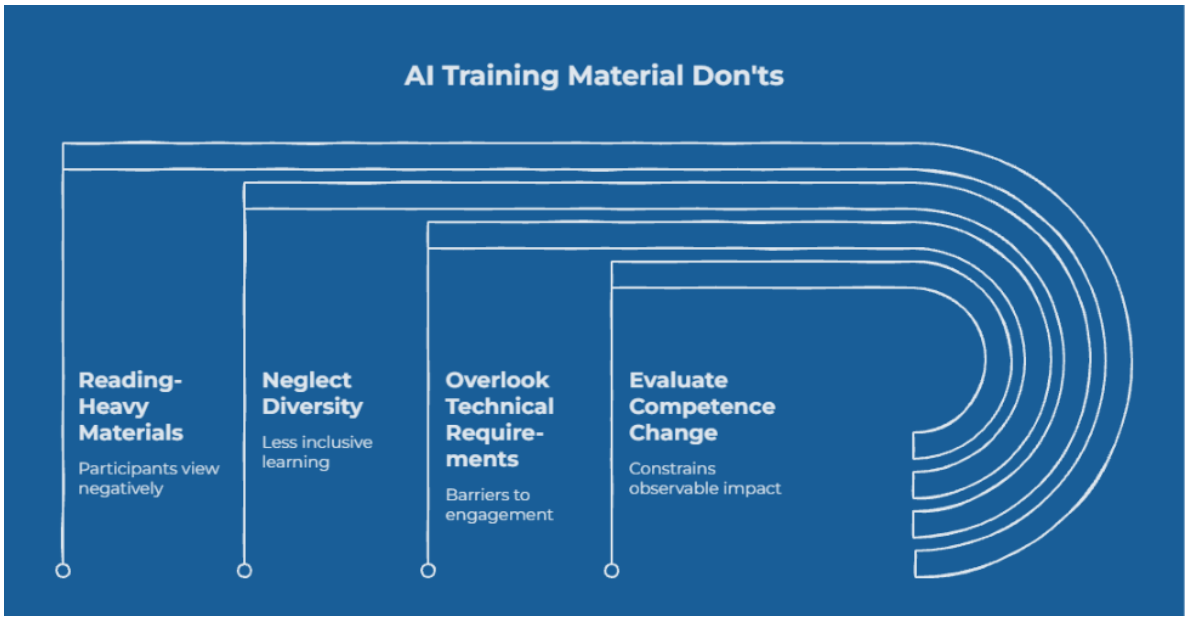


Figure 2: AI training material don'ts

- **Rely on reading-heavy materials.** Long academic papers and a lack of practical examples were viewed negatively by participants.
- **Neglect diversity.** Participants differ in AI literacy, language skills, and preferred ways of learning. More inclusive materials create richer learning experiences.
- **Overlook technical requirements.** Participants should engage with technical activities without barriers. Minimise technical issues that are easily avoided.
- **Evaluate competence change over the short term.** Brief exposure constrains the observable impact on competence development. Plan for long-term evaluation.

3.2 Tips for motivating participants to engage with training



Figure 3: Cycle of motivating training participants.

- **Recognize achievement.** Certificates that outline the training received and competence development can motivate participation.
- **Incorporate practical examples.** Teachers appreciated seeing cases that demonstrate impact and practical guidance to deploy them in their everyday teaching
- **Offer modular training.** Offer flexibility in training programs that allow participants to select only the modules that are relevant and of priority to their institutional needs
- **Build a community.** Participants value belonging to a community where they can share doubts, achievements, and artifacts.
- **Keep the course up to date.** Because AI evolves quickly, update materials regularly and notify participants of changes.

4. Beyond the pilot: future opportunities

The IDEAL approach is built to have a lasting impact, with open resources that the wider community can freely reuse and adapt.

4.1 Scaling and valorisation

- IDEAL produced two comprehensive assessment instruments (a) LEVEL5 assessment and (b) the SPIDER questionnaire. Using the LEVEL5 assessment, teachers can assess two core competencies: (1) *Responsible Artificial Intelligence Integration in Higher Education* (Link: https://ideal.q21.de/mod/h5pactivity/view.php?id=14) and (2) *Critical Data Analysis and Validation in Higher Education* (Link https://ideal.q21.de/mod/h5pactivity/view.php?id=13). The SPIDER is a structured reflection tool that can orient, make aware, and provide momentum for students and teachers within the rapidly evolving field of Artificial Intelligence and data-informed practice in higher education. It prompts reflection on six key areas related to the courses from the IDEAL Learning Platform and to identify strengths and potential areas for development. These assessments are also available in several languages e.g., English, Spanish, German, Italian, and Greek. They have already been validated in pilot studies and can be used by teachers, students, and researchers in higher education to assess their competencies.
- The modular design of the IDEAL Competence Framework enables higher education institutions to adopt it entirely or selectively depending on their institutional needs and priorities. The framework provides a common reference for the design of professional development programmes, curriculum innovation, and institutional policy development. Moreover, the IDEAL Competence Framework developed within the project can guide not only European higher education teaching staff but also the wider uptake of AI integration across other Erasmus+ projects, integrating AI critically, ethically, and effectively.
- The pilots conducted in real teaching and learning situations at universities showed the value of the IDEAL Learning Suite (Link: https://ideal.q21.de/) as a source of inspiration and a resource for strengthening data analysis and AI competences for learners, educators, researchers, and other stakeholders. To support scalability, the IDEAL Learning Suite has been

made publicly available and accessible to anyone. Training materials have been shared for university teaching innovation & training centers for their adoption (e.g., they have already been considered by trainers at Pompeu Fabra University).

- Evidence from pilots across multiple EU countries can inform institutional and national policies on AI literacy, digital education, lifelong learning, and responsible AI. For instance, the IDEAL materials can be a source of information that can be extended to the EU. By leveraging openly licensed educational resources, the competence framework, and practical insights from local pilots in multiple countries, the EU can establish standardized guidelines to facilitate subsequent implementation efforts across educational sectors and learning environments.
- The IDEAL approach can be shared across existing teacher communities using platforms such as TRAILS (Link to the TRAILS platform: https://trails.upf.edu/). This platform is the result of an Erasmus+ funded project that aims to help teachers, educators, and researchers to produce learning activities focused on promoting the use of generative AI with transparency, responsibility, and in a constructive manner. The platform has an online community of 230 registered teachers. Sharing experiences, resources, pilot activities, and best practices related to the IDEAL approach within a considerably large active community of teachers on a platform such as TRAILS can help others become familiar with the IDEAL approach and support its long-term sustainability. Moreover, sharing the IDEAL approach with other existing teacher communities will create opportunities for scalability by increasing its visibility across active educational networks.

4.2 Looking ahead

The IDEAL approach contributed with a learning suite, a competence framework to guide the learning offer, instruments to track competence development, and professional development opportunities for teachers in higher education. The outputs provide a sustainable foundation for continued use beyond the project's lifetime. Looking ahead, the project's results can be used by educators and other Higher Education stakeholders across Europe, supporting the continued development of digital competences and innovative teaching practices.

5. Conclusion

CALL TO ACTION

AI in education is no longer a matter for the future, it is here and now.

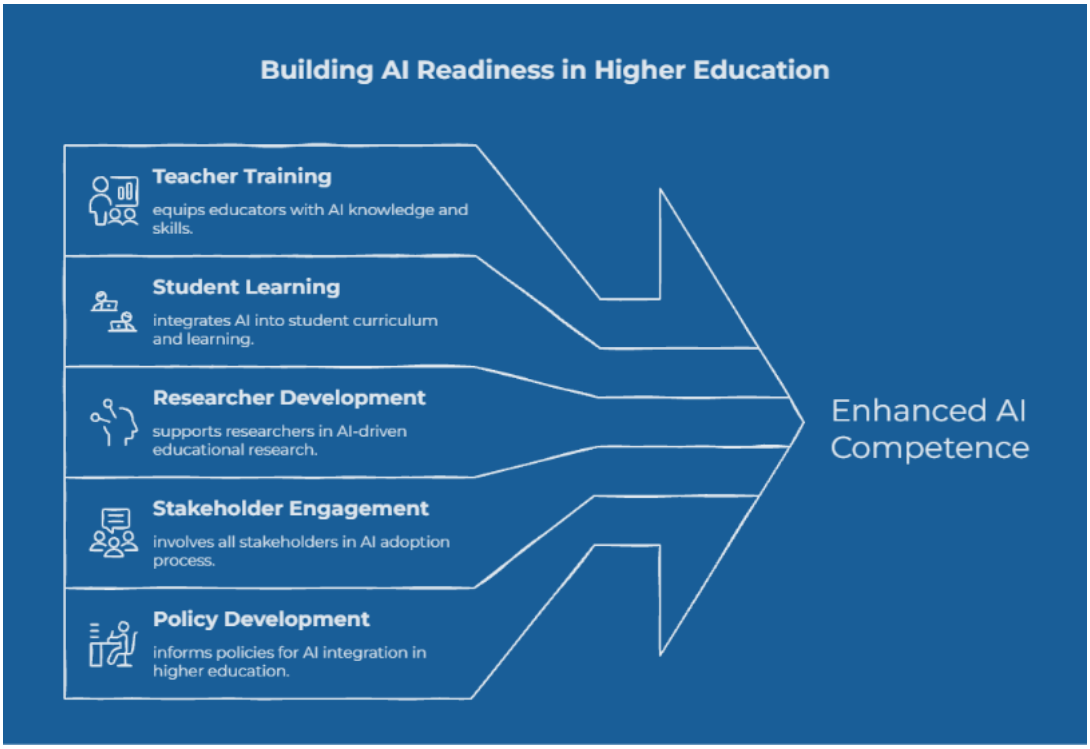


Figure 4: Building AI readiness in Higher Education.

Preparing teachers, students, researchers, and other stakeholders for the responsible use of AI has become an urgent priority. Higher education institutions should proactively integrate data analysis and AI competences into teaching, learning, and professional development. The IDEAL project provides a practical, evidence-informed approach to support this transition within the European higher education context.

European higher education institutions can build on the IDEAL approach, competence framework, learning resources, and assessment instruments to strengthen the development of data analysis and AI competences among teachers and students. The project's findings can also inform policy development at institutional, national, and European levels. More broadly, the IDEAL approach demonstrates a scalable and transferable model that can support competence development in higher education.



Co-Funded by
the Erasmus+ Programme of
the European Union

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 of the National Agency Erasmus+ – INDIRE. Neither the European Union nor the granting authority can be held responsible for them.