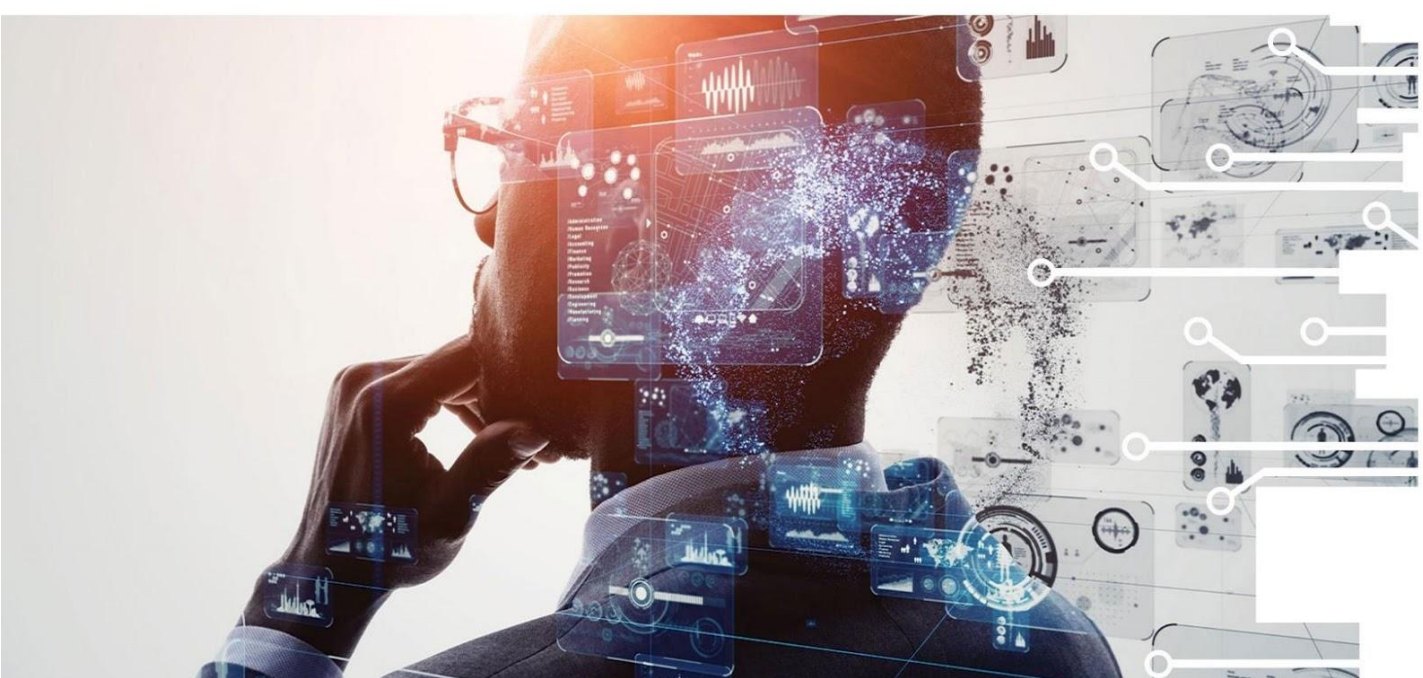




AI4VET4AI

AI-powered Next Generation of VET AI in Education - Human-AI Collaboration in Teaching and Learning

IVET Teacher Training Materials



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Purpose of the document

This document supports IVET teachers in integrating the MOOC into their teaching practice. It provides pedagogical guidance, classroom implementation strategies, AI use cases relevant to vocational education, and ready-to-use activities. The materials are designed to support both classroom delivery and teacher self-study.

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Format: Pedagogical, practical, classroom-oriented, and self-study friendly.

1. Introduction to the MOOC and Its Relevance for IVET Trainers

1.1 Overview of the MOOC Topic

This MOOC introduces IVET students and their teachers to Artificial Intelligence (AI) as it applies to teaching and learning environments. It is designed specifically for students who are training to become teachers or educators — and for the IVET teachers who guide them. Across three modules and nine units, students discover how AI is transforming assessment, feedback, tutoring, and learning management in education, and what this means for their own future professional roles in classrooms, training rooms, and online learning environments.

The MOOC is practical and reflective by design. No prior technical knowledge is required. All concepts are illustrated with real-world examples from vocational and educational settings, and all three use cases (D6.3.2, D6.3.3, D6.3.4) feature protagonists — a student, a teacher, and a professor — navigating realistic AI-related dilemmas that trainee teachers will immediately recognise as relevant to their chosen profession.

1.2 Why this topic Matters for Trainee VET Educators

Students entering initial teacher education today will begin their teaching careers in environments profoundly shaped by AI. Whether they go on to teach in VET schools, adult learning centres, workplace training contexts, or online platforms, they will encounter AI-powered tools: automated feedback systems, adaptive learning platforms, AI tutoring assistants, learning analytics dashboards, and AI-generated course content. Understanding these tools critically — not just using them — is a foundational competence for the next generation of educators.

For IVET students specifically, this MOOC serves a dual purpose: it develops their own AI literacy as learners (so they can engage critically with AI tools in their studies), and it prepares them to be AI-literate educators (so they can design, facilitate, and evaluate AI-supported learning for their own future students). The three use cases make this dual purpose explicit: Use Case D6.3.2 explores it from a student's perspective, D6.3.3 from a teacher's perspective, and D6.3.4 from a lecturer's perspective.

1.3 Addressing Uncertainty Around AI

Many young trainee teachers approach AI with a mixture of curiosity and anxiety — often shaped by popular media narratives about automation replacing human jobs, including teaching. This MOOC, and the accompanying materials, are designed to engage that ambivalence productively. Teachers do not need to be AI experts. Their role is to create a space for informed, critical, and professionally grounded engagement with the material — helping students see AI not as a threat to their chosen career, but as a set of tools that will require their professional judgment, ethical awareness, and pedagogical creativity.

1.4 Who This MOOC Is Designed For

In an IVET context, the primary learners are:

- Students in initial teacher education programmes aged 18 to 30, typically in their second or third year of a VET teaching qualification

- Students across a wide range of teaching specialisms: vocational subjects (healthcare, business, IT, hospitality, logistics, social care), general education subjects, and practical skills areas
- Students with basic to intermediate digital skills and limited formal exposure to AI concepts in an educational context
- IVET teachers who wish to develop their own AI literacy alongside their students and integrate the MOOC into existing digital literacy or professional studies modules

1.5 How This MOOC Supports IVET Teachers

The modular structure reduces preparation time significantly. Each unit is self-contained and includes knowledge checks, reflective prompts, case studies, and scenario exercises. Teachers can assign units for independent online work, use selected sections as classroom triggers for discussion, or integrate the full MOOC into a semester-length professional studies strand. The three dedicated use cases provide ready-made, classroom-tested discussion scenarios that connect MOOC content to authentic educator dilemmas — making the material immediately engaging for trainee teachers.

2. Target Learners and Vocational Relevance

2.1 Student Profile

The primary target audience in an IVET context is students aged 18 to 30 enrolled in initial teacher education programmes for VET. These students are at an early but formative stage of professional identity development — they are learning not only the content of their teaching specialism but also the pedagogical competences, ethical responsibilities, and professional dispositions that define effective teaching.

Typical characteristics of this learner group:

- Comfortable with smartphones and social media but with limited understanding of how AI algorithms work behind those platforms
- High motivation when learning connects directly to their future classroom practice and professional identity as teachers
- Preference for concrete, case-based, and interactive learning over abstract theory — the use cases are designed precisely for this preference
- A mix of vocational specialisms and backgrounds, creating rich diversity for cross-specialism discussions about AI in education
- Some uncertainty or anxiety about AI's implications for the teaching profession — which should be acknowledged and explored, not dismissed

2.2 Prior Knowledge Requirements

No prior knowledge of Artificial Intelligence is required. Basic digital literacy is sufficient. Teachers may find it useful to begin with an informal discussion about AI tools students already use — streaming recommendations, social media algorithms, voice assistants, translation tools, grammar checkers — to activate prior knowledge and demonstrate that students know more than they think.

2.3 Vocational Relevance — Education as the Professional Sector

Just as an 'AI in advertising' MOOC prepares students for marketing careers, this MOOC prepares students for careers in teaching and education. The professional contexts to which MOOC content directly applies include:

- VET classroom teaching: using AI tools for assessment feedback, differentiated instruction, adaptive exercises, and formative monitoring — while maintaining pedagogical oversight and fairness
- Workplace and adult training: AI-assisted tutoring, quiz generation, and learner analytics for professional development programmes
- Online and blended learning facilitation: AI-powered course design tools, LMS analytics, and personalised content delivery
- School administration and curriculum coordination: AI tools for scheduling, reporting, and curriculum alignment

- Special educational needs and inclusive teaching: adaptive platforms and AI accessibility features for diverse learners

All three IVET use cases feature educational protagonists: Jonas (a student experiencing AI's impact on his own learning — D6.3.2), Mira and Elena (a learner and teacher in an AI-monitored language class — D6.3.3), and Daniel and Prof. Mendes (a student and lecturer navigating an adaptive learning system — D6.3.4). This makes the professional relevance immediate for trainee teachers.

3. Learning Objectives and Competence Development

3.1 Overall MOOC Learning Objectives

After completing all three modules, students will be able to:

- Explain what Artificial Intelligence is and identify its foundational components: Machine Learning, NLP, Computer Vision, and Robotics (Bloom: Understand)
- Describe the historical development of AI and distinguish between AI capability categories (Bloom: Understand)
- Identify AI tools used in educational assessment and feedback and evaluate their strengths and limitations for teaching practice (Bloom: Apply / Evaluate)
- Explain how AI-based tutoring systems, chatbots, and virtual assistants support differentiated learning — and the risks when they malfunction or oversimplify (Bloom: Understand / Apply)
- Analyse how adaptive learning technologies and AI-powered LMS platforms personalise instruction and the implications for educator roles and learner autonomy (Bloom: Analyse)
- Interpret learning data from dashboards and apply GDPR rights responsibly in educational data contexts (Bloom: Apply / Evaluate)
- Apply ethical and pedagogical criteria when selecting and integrating AI tools into teaching settings (Bloom: Apply / Evaluate)
- Design human-AI collaborative learning activities that preserve teacher authority and student agency (Bloom: Create)
- Evaluate the ethical implications of AI in education — bias, transparency, data privacy — and articulate these clearly (Bloom: Evaluate)

Students completing the PBL task additionally demonstrate the ability to design a research-informed, AI-supported pedagogical session grounded in academic literature (Bloom: Create) and to critically evaluate AI tool choices including risks, limitations, and ethical responsibilities (Bloom: Evaluate).

3.2 Competence development

1. Vocational competences (Teaching-specific)

- Understanding of how AI tools are deployed in educational and training settings, grounded in the three use cases
- Ability to identify appropriate AI tools for specific pedagogical challenges in their own teaching specialism
- Practical experience designing, critically evaluating, and reflecting on AI-supported learning activities (PBL students)

2. Digital competences

- AI and data literacy: understanding how AI systems process data and generate outputs, with the caveats illustrated in use cases
- Critical evaluation of AI tools for suitability, fairness, and pedagogical soundness in educational contexts
- Awareness of digital rights, privacy, and data protection under GDPR as they apply to teachers and students

3. Transversal competences

- Critical thinking: assessing AI benefits, risks, and societal implications in educational settings
- Ethical reasoning: identifying and responding to fairness, surveillance, privacy, and accountability issues
- Communication: articulating AI concepts clearly to students, colleagues, parents, and institutions
- Research skills (PBL): conducting a literature search, synthesising academic sources, and applying evidence to design
- Lifelong learning: developing habits of critical engagement with rapidly evolving digital tools

3.3 Employability and Career Development

The competences developed through this MOOC align with EU digital competence frameworks (DigComp) and with growing expectations across all educational sectors for AI-literate teachers. Students who complete the MOOC as well as the PBL task will be able to demonstrate verifiable AI literacy and reflective professional competence in portfolios, job applications, and teacher certification processes.

4. Overview of the MOOC Structure and Content

4.1 Module and PBL Overview

The MOOC comprises three modules of three units each. The IVET pathway includes an additional Project-Based Learning (PBL) task that draws on content from all three modules and the three use cases, assessed separately for 2 ECTS credits. The full IVET course represents approximately 70–72 hours of student work (18–22 hours MOOC + 50 hours PBL).

Table 1 MOOC overview

Mod.	Title	Units	Est. Time
1	Introduction to AI in Education & AI-Assisted Learning and Teaching Tools	1.1 AI and Its Role in Education 1.2 AI in Student Assessment and Feedback 1.3 AI-Based Tutoring Systems, Chatbots and Virtual Assistants	6–7 hours
2	AI for Personalized Learning and Adaptive Systems	2.1 Adaptive Learning Technologies 2.2 AI-Powered Learning Management Systems 2.3 Data-Driven Insights in Learning	6–7 hours
3	Ethical and Pedagogical Considerations	3.1 Integration of AI in Teaching Settings 3.2 Human-AI Collaboration in the Classroom 3.3 Ethics in AI for Education & Data Security	6–8 hours
PBL	Project-Based Learning Task — IVET only (2 additional ECTS)	5-phase individual project integrating all modules and use cases D6.3.2, D6.3.3, D6.3.4	~50 hours

4.2 Unit Summaries

Module 1

Unit 1: AI and Its Role in Education

This unit establishes foundational AI literacy. Students explore Machine Learning, NLP, Computer Vision, and Robotics — understanding how these underpin tools they will encounter as educators. The historical arc from Alan Turing's 1950 Turing Test to contemporary generative AI is covered through interactive timelines. The unit frames AI as a set of tools with specific capabilities and limitations, not a magical force — crucial for trainee teachers who will need to explain AI to their own future students.

Unit 2: AI in Student Assessment and Feedback

Students examine how AI tools support formative and summative assessment — auto-graders (Gradescope), writing tools (Grammarly, Write & Improve), plagiarism detection (Turnitin, Urkund), and analytics (Century Tech). The unit addresses bias, accuracy limits, and the irreplaceable role of teacher judgment — essential knowledge for trainee educators who will soon be making their own assessment decisions.

Unit 3: AI-Based Tutoring Systems, Chatbots, and Virtual Assistants

Students explore AI tutoring systems (Knewton Alta, MATHia, IBM Watson Tutor) and chatbot evolution. The balance between genuine learning support and problematic over-reliance is central — directly connecting to Use Case D6.3.2 (Jonas), whose experience of AI study tools illustrates both the benefits and the risks from a learner's perspective.

Module 2

Unit 1: Adaptive Learning Technologies

Students explore how adaptive systems dynamically adjust content and pacing, tracing the history from Skinner's teaching machine to modern AI platforms. Use Cases D6.3.3 and D6.3.4 both illustrate what happens when adaptive systems misinterpret learner behaviour — making this unit particularly vivid for trainee teachers who will be responsible for overseeing such systems.

Unit 2: AI-Powered Learning Management Systems

Students examine LMS architecture — data ingestion, machine learning, real-time inference, and presentation layers. The ethical concerns about transparency and bias raised in Use Cases D6.3.3 (emotional tracking of Mira) and D6.3.4 (pathway lock-in for Daniel) are directly relevant here.

Unit 3: Data-Driven Insights in Learning

Students explore how learner behaviour generates data, how dashboards visualise progress, and how six types of learning insight support teaching decisions. A branching scenario guides ethical decision-making when a student is flagged as 'at risk'. GDPR learner rights are covered fully — with direct implications for students' own future teaching responsibilities.

Module 3

Unit 1: Integration of AI in Teaching Settings

Practical implementation: selecting AI tools aligned with pedagogical goals, maintaining pedagogical integrity alongside automation, and monitoring AI impact. Interactive decision-making scenarios guide students through realistic classroom dilemmas — connecting to Use Case D6.3.2 and the challenge of designing AI support that builds rather than replaces student thinking.

Unit 2: Human-AI Collaboration in the Classroom

Students examine how teachers and AI can share roles without diminishing teacher authority or student agency. Use Cases D6.3.3 (Elena overriding the emotional AI system) and D6.3.4 (Prof. Mendes questioning automated pathway decisions) illustrate precisely the kind of active human oversight this unit advocates.

Unit 3: Ethics in AI for Education and Privacy

The final unit brings together all ethical threads: GDPR rights, algorithmic bias, surveillance risk, transparency, consent, and the right to challenge AI decisions. Use Case D6.3.3 (emotional monitoring of Mira) is the paradigm case for this unit. A branching scenario simulates an LMS flagging a student as 'at risk' and guides ethical responses.

4.3 Level of Difficulty

Beginner to intermediate level. No technical knowledge is assumed. Bloom's taxonomy levels are primarily Understand and Apply across Modules 1 and 2, with significant Analyse and Evaluate components in Module 3. The PBL task extends this to Create.

4.4 Constructive Alignment

The table below maps each learning objective to its corresponding MOOC unit, the activity through which it is practised, and the assessment approach. The final row shows the PBL task, which is exclusive to the IVET pathway and accounts for 2 additional ECTS credits.

Table 2 Constructive Alignment

Learning Objective	Module / Unit	Activity	Assessment
Explain core AI concepts and distinguish AI types	Mod.1, Unit 1	Click-to-reveal; multiple choice quiz	Knowledge check quiz
Describe AI milestones and current trends	Mod.1, Unit 1	Drag-and-drop timeline	Matching exercise
Identify AI assessment tools; evaluate automated feedback	Mod.1, Unit 2	Case analysis; reflective exercise	Reflection + discussion
Explain AI tutoring systems, chatbots, virtual assistants	Mod.1, Unit 3	Matching; scenario — connects to Use Case D6.3.2	Scenario-based quiz
Analyse adaptive learning technologies	Mod.2, Unit 1	Interactive diagram; scenario — connects to Use Cases D6.3.3 & D6.3.4	Multiple choice + reflection
Evaluate AI-powered LMS features and ethics	Mod.2, Unit 2	Click-to-reveal; case discussion — connects to Use Cases D6.3.3 & D6.3.4	Reflection + case analysis
Interpret learning data; apply GDPR in teaching	Mod.2, Unit 3	Branching scenario; dashboard task	Scenario quiz; reflection
Apply pedagogical and ethical criteria for AI integration	Mod.3, Unit 1	Decision-making; matching — connects to Use Case D6.3.2	Multiple choice; discussion

Evaluate AI ethics, data privacy, and accountability	Mod.3, Unit 3	Branching scenario; GDPR quiz — connects to Use Case D6.3.3	Quiz + portfolio reflection
Design a research-informed AI-supported VET session (PBL)	All modules (applied)	5-phase project drawing on all use cases and MOOC content	Written report (1,000 words) + oral/visual presentation (8–10 min)

5. Key AI Concepts Explained for Teachers

This section provides non-technical explanations of key AI concepts covered in this MOOC, with explicit connections to the three IVET use cases where relevant. These are designed to build teacher confidence and provide vocabulary for facilitating classroom discussions with trainee teachers.

Table 3 Key AI concepts covered in MOOC

Concept	Explanation	Real-world Example	Relevance to VET Teaching
Machine Learning (ML)	Algorithms that learn from data and improve without explicit programming.	Spam filters; Netflix recommendations	Underpins adaptive feedback, personalised pathways, and at-risk prediction in LMS platforms
Natural Language Processing (NLP)	AI that enables machines to understand and generate human language.	ChatGPT; Grammarly; Google Translate	Powers automated writing feedback, chatbots, and conversational tutoring systems
Adaptive Learning Systems	Systems that adjust content, pacing, and format based on real-time learner data.	Knewton Alta; DreamBox; Khan Academy	Central theme of Use Case D6.3.4 — Daniel's learning pathway locked by early quiz performance
Emotional AI / Affective Computing	AI that attempts to detect and respond to learner emotions from behavioural signals.	Webcam engagement tracking; speech-tone analysis	Central theme of Use Case D6.3.3 — Mira misclassified as disengaged
Learning Analytics	Collecting and analysing learner data to improve teaching decisions.	Moodle dashboards; Canvas; Century Tech	Enables teachers to identify at-risk learners — with the caveats illustrated in Use Cases D6.3.3 & D6.3.4
Generative AI	AI that produces new text or content in response to prompts.	ChatGPT; Claude; DALL-E	Relevant to Use Case D6.3.2 — Jonas uses AI to generate study summaries, outlines, and practice questions
Algorithmic Bias	When AI produces unfair outcomes due to skewed training data or flawed assumptions.	Grading tools penalising non-standard grammar; adaptive systems locking learners into low pathways	Directly illustrated in Use Cases D6.3.3 (Mira) and D6.3.4 (Daniel)
GDPR / Data Privacy	EU regulation governing how personal data is collected, stored, and used.	Student LMS data; emotional tracking; analytics dashboards	Future teachers must understand their legal obligations before deploying any AI tool in a classroom

6. Pedagogical guidance for classroom implementation

6.1 Implementation Approaches

Full MOOC Integration

The MOOC can be integrated as a complete learning strand within a semester-length professional studies or digital literacy module in an IVET programme. Students complete MOOC units outside class time (asynchronously) and attend regular facilitated sessions where the teacher uses classroom activities and use case discussions to deepen engagement. The PBL task runs in parallel over the same period.

Partial Integration — Selected Modules

Teachers can select one or two modules most relevant to their curriculum or to students' teaching specialisms. For example, an IVET programme focused on healthcare or social care teaching might prioritise Module 2 (adaptive systems and analytics) and Module 3 (ethics and data privacy). Use Cases D6.3.3 and D6.3.4 are particularly strong anchors for this combination.

Project-Based Integration

For students completing the PBL task, the MOOC provides the theoretical foundation and the project provides the applied synthesis. Students work through MOOC content in the first half of the term, then spend the second half developing, writing, and presenting their AI-supported pedagogical session design. The three use cases serve as both inspiration and critical reference points throughout the project.

6.2 Teaching Recommendations

- Begin every session by connecting to students' future professional role: 'Imagine you are two years into your teaching career. A student comes to you worried that the school's AI platform is giving them the wrong kind of help. What do you do?' This creates professional urgency from the first minute.
- Use the use case protagonists (Jonas, Mira/Elena, Daniel/Prof. Mendes) as recurring reference points. Students find it easier to engage with principles when they are embodied in characters facing real dilemmas.
- Make the 'dual purpose' of this MOOC explicit: students are learning about AI both as learners themselves and as future teachers. Regularly ask: 'How does this apply to you right now as a student? And how will it apply to your students in five years?'
- Treat students as capable of sophisticated ethical reasoning. The data privacy and algorithmic bias discussions are not too abstract for initial teacher education — they are directly relevant to professional responsibilities students will soon carry.

6.3 Connecting the Use Cases to MOOC Units

The three use cases are not standalone reading tasks — they are integrated into the teaching sequence. The table in Section 7 below shows specifically when and how to use each case. As a general principle:

- Assign the use case as pre-reading 48 hours before the relevant session. Students should arrive having read the case and having one initial reaction ready to share.
- Open the session with the case's decision point (the protagonist's dilemma) rather than with MOOC content. Let students' intuitive responses drive discussion before introducing theoretical concepts.

- Return to the case at the end of the unit: 'Having studied this unit, would you advise the protagonist differently? What would you add?'

7. AI Use Cases for IVET classroom implementation

7.1 Overview

Three dedicated use cases have been developed as companion materials for this MOOC. They are structured narrative scenarios featuring student, teacher, and lecturer protagonists facing realistic AI-related dilemmas in educational settings. Each case includes: context, a narrative, a description of the AI system, a decision point, and five discussion/reflection questions.

These cases are provided as separate documents (Deliverables D6.3.2, D6.3.3, and D6.3.4). Teachers should share the relevant PDF with students as pre-reading before each session. The cases do not need to be explained or summarised by the teacher — students read them independently and bring their reactions to the classroom discussion.

Table 4 Integration of Use Cases into the MOOC Curriculum

Use Case	MOOC Units	Key Themes	Integration Guidance for Teachers
D6.3.2 – Optimising Study Efficiency and Academic Performance with AI (Jonas Bauer, undergraduate student)	Mod.1 Unit 3; Mod.2 Unit 1; Mod.3 Unit 1	AI study tools; academic over-reliance; critical thinking; learner autonomy	Assign as pre-reading before Module 1, Unit 3 (AI Tutoring Systems). Use Jonas's dilemma — genuine efficiency gains vs. hollowed-out understanding — as the opening discussion: 'As a future teacher, how would you respond to a student like Jonas in your class?' Return to it in Module 3, Unit 1 when discussing how to design AI-supported activities that preserve student agency. The five discussion questions work well as a whole-class debate or written reflection.
D6.3.3 – Innovative Learning Techniques Using AI to Identify and Adapt Learning to the Learner's Emotional State (Elena Markovic, language instructor; Mira Novak, learner)	Mod.2 Units 1–2; Mod.3 Units 2–3	Emotional AI analytics; algorithmic misinterpretation; learner surveillance; teacher override	Use this case alongside Module 2, Units 1–2 (Adaptive Learning and LMS). Mira's experience of being miscategorised by the system is a powerful illustration of algorithmic bias in a real classroom context. Run the five discussion questions as a role-play: half the class argues from Elena's perspective (teacher with institutional pressure), half from Mira's (learner misread by AI). Connect to Module 3, Unit 3 ethics discussion on consent and surveillance. Particularly impactful for trainee language teachers.
D6.3.4 – AI-Powered Adaptive Learning System for Personalized Education (Prof.)	Mod.2 Units 1–2; Mod.3 Units 1–2	Adaptive system lock-in; learner autonomy;	Assign before Module 2, Unit 1 (Adaptive Learning Technologies). Daniel's experience of being trapped in a

Laura Mendes; Daniel Petrov, student)		predictive analytics; human oversight	simplified learning pathway is the textbook case for why adaptive systems require active human oversight. After reading, ask trainees: 'If you were Prof. Mendes, at what point would you override the system? What data would you need?' Revisit in Module 3, Unit 2 (Human-AI Collaboration) when discussing how teachers and AI share decision-making authority. Works well as a case study analysis assessment.
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7.2 General Tips for Facilitating Use Case Discussions

- Assign the case as pre-reading at least 48 hours before the session. Students who have not read the case should read the decision point in class before discussion begins.
- Open with the protagonist's dilemma rather than with content delivery. Authentic engagement comes first; MOOC concepts provide the analytical framework afterwards.
- Encourage students to take the perspective of all actors in the case: the student (Jonas, Mira, Daniel), the teacher (Elena, Prof. Mendes), and the institution. Different perspectives generate richer debate.
- The five discussion questions at the end of each case are suitable as written reflection prompts, small-group debate starters, or formative assessment tasks.
- For PBL students, encourage them to reflect on how the case might inspire their problem definition in Phase 1.

8. Classroom Activities and Practical Exercises

The activities below are designed for IVET classroom settings. Activities 3, 4, and 5 are built directly around the three use cases (D6.3.2, D6.3.3, D6.3.4). All activities require only standard classroom resources or basic internet access. Each connects to specific MOOC units as indicated.

Table 5 Classroom Activities Supporting the MOOC Learning Outcomes

Activity	Time	Description	Format
AI in My Future Classroom	30 min	Students list 15 teaching tasks (giving feedback, differentiating content, grading, managing behaviour, planning lessons) and mark which could be AI-supported, which must stay human, and which are unclear. Results are compared and debated. Introduces Module 3, Unit 2 role analysis before students have studied it formally.	Individual → whole class
Automated Feedback Critique	45–60 min	Students submit a short reflective paragraph on a topic from their teaching specialism to a writing AI tool (Grammarly or Write & Improve) and evaluate the output from a teacher's perspective: Is this useful feedback for a student? What is missing? Could it disadvantage multilingual learners? Connects to Module 1, Unit 2.	Individual → group debrief
Jonas's Study Week — Role Analysis (Use Case D6.3.2)	40 min	After reading Use Case D6.3.2 (Jonas Bauer), students map Jonas's AI use across a typical study week and classify each use as 'supporting learning', 'replacing thinking', or 'borderline'. They then redesign his study plan with appropriate AI boundaries. Connects to Module 1, Unit 3 and Module 3, Unit 1.	Small groups → class discussion
Mira vs. the Algorithm — Debate (Use Case D6.3.3)	45 min	After reading Use Case D6.3.3 (Mira Novak), students role-play two positions: Elena the teacher (institutional pressure to use the system) vs. Mira the learner (misread and frustrated). Each side prepares a 3-minute argument. Discussion is followed by a structured debrief on emotional AI ethics. Connects to Modules 2 and 3.	Structured debate → teacher-led debrief
Analysing Daniel's Pathway (Use Case D6.3.4)	50 min	After reading Use Case D6.3.4 (Daniel Petrov), students examine the platform's adaptive logic, identify the moment the system began limiting Daniel's progression, and propose at least three concrete changes to the platform's design or oversight procedures. Connects to Module 2, Units 1–2.	Small groups → group report-back

Human-AI Teaching Plan	60 min	Students take a traditional 90-minute lesson plan (provided by teacher) and redesign it integrating one AI tool. They specify when AI is used, what the teacher does at each stage, how student agency is preserved, and how they would explain AI use to students and parents. Peer review using a simple rubric.	Pairs → peer review
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9. Assessment and Evaluation Validation

9.1 Standard MOOC Assessment (All Students)

Knowledge checks are embedded throughout the MOOC as multiple choice questions, drag-and-drop exercises, matching tasks, scenario-based decision trees, and reflective prompts. These are formative and self-directed — they provide immediate feedback and do not require teacher grading.

For summative assessment of MOOC content, teachers may choose from the following options, adapted to the institutional context:

- Option A — Use Case Analysis: Select one of the three IVET use cases (D6.3.2, D6.3.3, or D6.3.4) and produce a structured written analysis (~500–700 words) covering: the AI technology involved, its pedagogical implications, risks and limitations, and what you would do differently as the educator in the scenario.
- Option B — AI Tool Evaluation Report: Choose one AI tool from the MOOC, explore its free version or documentation, and write a professional evaluation report (~400–600 words) addressing: what it does, how you could use it in your future teaching specialism, its limitations, and any ethical or GDPR concerns.
- Option C — Reflective Portfolio Entry: Write a reflective journal entry (~300–500 words) addressing: what surprised you about AI in education, how it changes your thinking about your future teaching practice, and one risk you will actively manage as a teacher.

Table 6 Assessment Rubric for Standard MOOC Summative Assessment

Criterion	Excellent	Satisfactory	Needs Development
Use of AI concepts	Accurately applies multiple MOOC concepts with nuance	Correctly uses key concepts with minor gaps	• Concepts absent, confused, or incorrectly applied
Connection to teaching practice	Strong, specific, pedagogically reasoned connections to VET or educational context	Reasonable connections with some specificity	• Connections vague, generic, or absent
Critical thinking	Evaluates benefits and risks; considers teacher, learner, and institutional perspectives	Identifies benefits and at least one risk	Describes features without evaluation
Ethical reasoning	Addresses fairness, privacy, transparency, and accountability with depth	Touches on at least one ethical dimension meaningfully	Ethical considerations absent or superficial
Communication	Clear, well-structured, and professional	Mostly clear with minor structural issues	Difficult to follow or poorly organised

9.2 Project-Based Learning Task (2 ECTS)

What Is the PBL Task?

The PBL task is an additional individual assignment for IVET students that accounts for 2 ECTS credits. Students design a research-informed, AI-supported pedagogical session for VET teacher education — taking the role of a teacher educator or pedagogical trainer.

The three use cases (D6.3.2, D6.3.3, D6.3.4) can serve as inspiration for identifying a pedagogical problem: Jonas's over-reliance on AI (D6.3.2) could inspire a session on teaching AI-critical study skills; Mira's misclassification (D6.3.3) could inspire a session on algorithmic bias in educational tools; Daniel's pathway lock-in (D6.3.4) could inspire a session on human oversight in adaptive learning.

All AI tools used in the project must be clearly documented and transparently acknowledged. This is an individual assignment.

Driving Question

How can an educator meaningfully integrate AI into designing a VET teacher education learning task to enhance learning outcomes while maintaining pedagogical quality, ethical integrity, and human oversight?

Project Phases and Deliverables

1. Phase 1 — Problem Identification (~10 hours): Identify a concrete pedagogical problem in teacher education (e.g. feedback quality, reflective writing, differentiation, assessment transparency). Conduct a literature search — minimum three peer-reviewed sources. Summarise key findings (~500 words). Deliverable: 1–2 page problem definition with references.
2. Phase 2 — Analytical Justification for AI Use (~8 hours): Explain why AI could effectively address the problem. Identify specific AI functionalities and tools. Discuss assumptions and limitations. Deliverable: 1-page justification specifying AI tools to be used.
3. Phase 3 — Session Design (~15 hours): Create a full plan for a 3–4 hour teacher-education session. Include objectives, time structure, activity sequence, learner-AI interaction design, and teacher role. Connect explicitly to research from Phase 1. Deliverable: 2–3 page structured session plan.
4. Phase 4 — Critical Evaluation (~10 hours): Evaluate the proposed design — pedagogical benefits, unintended consequences, risks of over-reliance on AI, feasibility. Deliverable: 1–2 page critical analysis.
5. Phase 5 — Ethical and Professional Reflection (~5 hours): Reflect on transparency, potential bias, data protection, and professional responsibilities. Deliverable: 1–2 page ethical and professional evaluation.

Final Output

Structured individual report (maximum 1,000 words, excluding references) covering all five phases, plus a recorded or live oral/visual presentation (8–10 minutes). Minimum three scholarly peer-reviewed sources. All AI tools used in developing the project must be disclosed.

Teacher Guidance for Facilitating the PBL Task

- Support students in scoping the pedagogical problem — many initial ideas are too broad. A single aspect of formative feedback or one specific challenge in reflective writing is more manageable than 'improving teaching quality'.
- Recommend that students draw on one of the three IVET use cases as a source of inspiration for their problem definition — this grounds their project in a concrete, recognisable scenario.
- Offer formative feedback on Phase 1 before students proceed to design. A well-defined problem is the foundation of the whole project.
- Ensure ethical reflection engages seriously with data protection and bias — not as box-ticking but as genuine professional reasoning about responsibilities students will soon carry as teachers.

Table 7 Assessment Rubric

Criterion	Excellent (A)	Good (B)	Satisfactory (C)	Needs Improvement (D/F)
Problem Definition & Research Basis (15%)	Clearly identifies a well-defined pedagogical problem grounded in 3+ quality peer-reviewed sources; deep understanding of its significance.	Defines problem supported by 3 sources; good understanding demonstrated.	Problem stated but vaguely defined or partially supported; meets minimum.	Problem poorly defined or unsupported; literature incomplete or absent.
Justification for AI Use (15%)	Clear analytical justification; correct identification of tools and functionalities; explicit assumptions and limitations discussed.	Justification provided; tools relevant and explained; some assumptions noted.	Justification limited or unclear; tools identified but not fully linked to problem.	Justification missing or irrelevant; tools incorrectly identified.
Pedagogical Session Design (25%)	Highly detailed; objectives, time structure, activities, learner-AI interaction, and teacher roles clearly defined; explicit research connections.	Clear design with defined objectives, structure, and AI integration; some research connections.	Basic design; objectives and structure partially defined; minimal research connection.	Incomplete, unclear, or lacking AI integration.
Critical Evaluation (20%)	Deep, reflective analysis of pedagogical value, risks, unintended consequences, and feasibility;	Thoughtful evaluation of benefits, risks, and feasibility.	Limited evaluation; partial discussion of benefits and risks.	Evaluation missing, shallow, or lacking evidence.

	evidence-based throughout.			
Ethical & Professional Reflection (15%)	Thoroughly addresses transparency, bias, data protection, and professional responsibility; strong ethical reasoning.	Addresses ethical issues and professional responsibility with some depth.	Addresses ethical issues superficially or partially.	Ethical reflection minimal, incorrect, or absent.
Presentation & Communication (10%)	Well-structured, professional, clear; coherent, logical, and error-free; presentation effectively summarises.	Clear report with minor writing errors; presentation clear.	Ideas communicated but partially unclear or lacking organisation.	Poorly organised; presentation unclear or incomplete.

10. Integrating the MOOC into IVET curricula

10.1 Business and Administration Teacher Education

Module 1, Unit 2 (AI assessment and feedback), Module 2, Unit 3 (learning data), and Module 3, Unit 1 (pedagogical integration) connect directly to digital administration, analytics, and AI-assisted business communication tools that students will encounter in their future business teaching contexts. Use Case D6.3.4 (adaptive learning in a university maths course) illustrates efficiency-vs-fairness tensions directly relevant to business education settings.

10.2 Healthcare and Social Care Teacher Education

Module 2, Unit 1 (adaptive learning), Module 2, Unit 2 (LMS), and Module 3, Unit 3 (data ethics) connect to AI tools in patient data management and care personalisation. Use Case D6.3.3 (emotional monitoring of Mira in a language class) raises the same ethical questions about AI interpreting human states that arise in healthcare AI contexts — making it a powerful cross-specialism discussion anchor.

10.3 IT and Digital Services Teacher Education

All modules are relevant. IT education students can engage at greater depth with Module 1, Unit 1 (AI foundations) and Module 2, Unit 2 (LMS architecture). PBL students in IT teacher education might design a session on AI-supported code review or adaptive programming exercises.

10.4 Hospitality, Tourism, and Service Industries Teacher Education

Module 1, Unit 3 (chatbots and virtual assistants) and Module 3, Unit 1 (AI integration in teaching) connect directly to AI-powered booking systems and customer service tools that students will reference in their future hospitality teaching. Use Case D6.3.2 (Jonas's AI study tools) resonates with time-pressured service industry students managing work and study simultaneously.

10.5 Implementation Steps

1. Review your institution's policy on external learning platforms and acceptable AI tool use.
2. Identify where MOOC content aligns with existing learning outcomes in your curriculum (professional studies, digital literacy, pedagogical methods).
3. Communicate clearly with students about how MOOC completion and PBL work contribute to their grade.
4. Plan facilitated classroom sessions to accompany MOOC units — do not simply assign the MOOC without structured follow-up.
5. For the PBL task, set clear phase-by-phase milestones with at least one formative feedback checkpoint before final submission.

11. Supporting students with different backgrounds and needs

11.1 Students with Low Digital Skills

Conduct a brief digital readiness check before starting. Identify students who may need support navigating online platforms or accessing video content.

The use case narratives are fully accessible without technical background — they are story-based and focus on professional judgment, not technical knowledge.

Provide printed summaries of key concepts for students who prefer hard copy or struggle to read on screen.

11.2 Students with No Prior AI Knowledge

Begin every session with a personal connection: 'Where have you already encountered AI today as a student or a consumer?' Almost every student has, though they may not have labelled it as AI.

Use pedagogical analogies: an adaptive system as a teacher who adjusts task difficulty in real time; a learning analytics dashboard as a teacher's observation notes; an AI tutor as a patient study companion.

11.3 Students with Anxiety About AI and the Teaching Profession

Acknowledge concerns openly — many trainee teachers worry that AI will make teaching obsolete. This worry deserves a serious, pedagogically grounded response, not dismissal.

The MOOC consistently argues that AI requires human oversight, ethical judgment, and pedagogical creativity — exactly the professional capacities students are developing. Use this as a confidence anchor.

Use Case D6.3.3 (Mira misread by the emotional AI system) is particularly powerful for this conversation: the AI's failure to understand a human learner's actual experience illustrates why human teachers remain essential.

11.4 Students with Different Learning Speeds

Fast finishers can pursue optional MOOC extensions, read additional use cases beyond the three assigned, or research AI policies at their placement school.

Slower learners can revisit MOOC units asynchronously without pressure, using knowledge checks as self-assessment tools.

11.5 Students with Disabilities

Ensure MOOC content is accessed with accessibility features: screen readers, text enlargement, closed captions on videos.



Offer alternative assessment and PBL presentation formats: oral presentation instead of written report; recorded video instead of live presentation.

12. Additional resources for teachers

12.1 Recommended Videos

- 'How AI Could Save (Not Destroy) Education' — Sal Khan, TED Talk (15 min): Particularly relevant for trainee teachers anxious about AI displacing human educators. Khanmigo demonstrates AI tutoring that requires human pedagogical framing.
- 'How AI is Used in Education' — UNESCO (5 min): Global perspective including equity and access implications — important for trainee teachers who will teach diverse populations.
- 'Rethinking Assessment in the Time of AI' — UNSW eLearning, Prof. Cath Ellis (3:33 min): Directly relevant to Module 1, Unit 2 and to trainees who will soon design their own assessments.
- 'AI in Education: Benefits and Challenges' — EdTech Magazine (5 min): Balanced overview suited to initial teacher education settings.
- 'GDPR Explained' — Channel 4 News (5:39 min): Clear, accessible explanation; suitable for sharing with students who will need to understand data protection in their own future classrooms.

12.2 Useful Articles and Reports

- UNESCO (2023): Guidance for Generative AI in Education and Research — policy framework for responsible AI use.
- European Commission (2021): AI and Education — GDPR compliance and ethical AI deployment guidance for educational institutions.
- DigComp 2.2 (European Commission): Digital Competence Framework — foundational reference for AI literacy as a professional teaching competence.
- Hattie & Timperley (2007): 'The Power of Feedback' — seminal research on feedback effectiveness, referenced in MOOC Unit 1.2.
- AI4VET4AI Project Website: All use cases, MOOC content, IVET and CVET teacher training materials, and consortium resources.

12.3 AI Literacy Tools for Teacher Self-Study

- Elements of AI (elementsofai.com) — Free, non-technical AI fundamentals course; ideal teacher preparation before delivery.
- AI for Everyone — Andrew Ng, Coursera — Non-technical AI introduction for professionals and educators.
- European AI Alliance (digital-strategy.ec.europa.eu) — EU-level resources on AI strategy, regulation, and ethics.
- Khan Academy and Khanmigo — Free AI tutoring tool that can be demonstrated live in class; referenced in MOOC Unit 1.3.

13. Self-study guidance for IVET trainers

This section is designed to help you use this document independently, without institutional support or formal training. Whether you are preparing to deliver the MOOC for the first time or returning to it for a new group, the guidance below will help you prepare efficiently and confidently.

13.1 Recommended Reading Order

If you are new to this MOOC and preparing for delivery, follow this sequence:

Read Section 1 (Introduction) and Section 2 (Target Learners) first — understand what this MOOC is for and who your students are as trainee educators.

Read Section 6 (Key AI Concepts) carefully — this is the single most important preparation step for building your own confidence. Pay particular attention to the use case connections in the rightmost column.

Read all three use cases (D6.3.2, D6.3.3, D6.3.4) in full as standalone PDFs. Then read Section 7 (Use Cases) in this document for integration guidance.

Work through Section 4 (MOOC Structure) to understand the flow of all nine units and how the use cases map onto them.

Review Section 5 (Constructive Alignment) — this gives you the full picture of how learning objectives, activities, and assessments connect.

Select two or three activities from Section 8 (Classroom Activities) suited to your group and delivery context. Note which activities draw on which use cases.

Read Section 9 (Assessment) in full, including the PBL rubric, before introducing the PBL task to students.

Scan Sections 11 (Curricula Integration) and 12 (Supporting Diverse Learners) for any elements specifically relevant to your programme.

Spend 10–15 minutes with at least two of the recommended videos from Section 13 — particularly the Sal Khan TED Talk and the UNSW assessment video.

Complete at least two MOOC units independently as a learner. This is the most effective preparation step of all.

13.2 Estimated Preparation Time

Reading this guide in full: approximately 1.5–2 hours

Reading the three use cases (D6.3.2, D6.3.3, D6.3.4): approximately 1 hour

Completing MOOC units as a learner: approximately 18–22 hours (full course); 6–8 hours (one module only)

Preparing classroom materials and activities: approximately 2–3 hours per session

Reviewing and preparing the PBL task briefing and rubric: approximately 1 hour

Total recommended preparation before first delivery: 12–16 hours (excluding full MOOC completion)

13.3 Reflection Questions for Teachers

Before delivering this MOOC, take time to work through the following questions. There are no right or wrong answers — they are designed to help you connect the material to your own professional experience and to your students' specific contexts.

About Your Learners

Who are your students, and what teaching specialism are they training for? Which MOOC units and use cases will resonate most directly with their future professional context?

How can this MOOC support your learners' development — not just as AI-literate individuals, but as future teachers who will need to facilitate AI-related conversations with their own students?

Which use cases (D6.3.2, D6.3.3, D6.3.4) are most relevant to your students' context? Would Jonas's study dilemma, Mira's emotional monitoring case, or Daniel's adaptive pathway lock-in speak most immediately to their experience or future role?

About the Content

Which AI concepts in Section 6 do you feel most confident explaining? Which would you want to explore further before facilitating a discussion?

Are there AI tools already in use in your institution's LMS, assessment system, or administrative platform that you could reference to make the content immediately tangible for students?

How will you connect the MOOC's ethical discussions — algorithmic bias, GDPR, emotional tracking, adaptive lock-in — to real examples your students are likely to encounter in their teaching placements?

About Your Own Practice

Have you used any AI tools in your own teaching or course preparation? How might your own experience — positive or negative — enrich the discussions you facilitate?

How will you handle students who are anxious about AI displacing teachers? What framing, drawn from the MOOC content and the use cases, will help them engage constructively rather than defensively?

For the PBL task: how will you scaffold the five phases so that students have clear milestones and sufficient formative feedback before final submission? Which phase do you anticipate students finding most challenging — and how will you support them?

After your first delivery, what would you keep, change, or add? Building in a short personal debrief after each session is one of the most effective ways to improve the course over time.

13.4 Appendix A: Bloom's Taxonomy

Level	Key question answered	Example action verbs
1 — Remember	Can students recall information?	define, identify, list, name, recall, recognise
2 — Understand	Can students explain ideas?	describe, explain, summarise, classify, paraphrase
3 — Apply	Can students use knowledge?	use, demonstrate, implement, solve, illustrate
4 — Analyse	Can students break down concepts?	compare, differentiate, examine, organise, deconstruct
5 — Evaluate	Can students judge or critique?	assess, justify, critique, defend, recommend
6 — Create	Can students produce something new?	design, develop, construct, compose, produce

13.5 Appendix B: Example of a Constructive Alignment Table

Learning Objective	Classroom Activity	Assessment Method
Explain key AI concepts in the sector	Discussion / Q&A	Quiz / oral check
Identify relevant AI tools	Use-case analysis	Assignment / report
Analyse an AI-supported scenario	Group exercise	Group project / rubric
Evaluate ethical implications	Role-play / debate	Presentation / peer review
Design a simple AI-assisted workflow	Project work	Portfolio / demonstration
Environmental cost	Does the system add energy or resource burdens?	Use proportionate tools and include sustainability criteria.