

IDEAL

Integrating Data Analysis and AI in Learning Experiences

D4.1

IDEAL Learning Suite Architecture

Work Package 4: IDEAL Learning Suite

Prepared by

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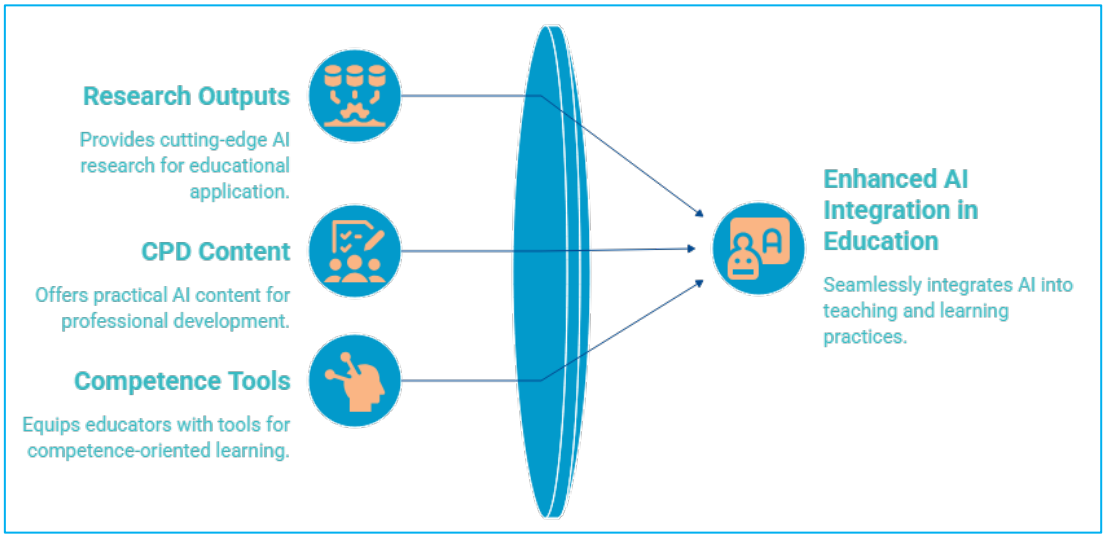
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Purpose and main proposition

The IDEAL Learning Suite offers higher education educators and learners a shared environment to explore AI in teaching and learning, develop practical ideas, and reflect on competence development. It brings research outputs, content developed through continuing professional development (CPD), and tools for competence-oriented learning into a topic-led collection that can be used and adapted in the project pilots. By connecting these elements, the Suite helps users move from project knowledge to educational practice and from pilot experience to examples that others can use.

This document describes the Suite as the offer of Work Package 4 (WP4): its content, organisation, educational concept, and relationship to the other project work packages. The account focuses on the platform offer; WP3 and WP5 provide the fuller accounts of CPD development and pilot implementation. Access, navigation and use are described in the IDEAL Learning Suite Guide (D4.2).



1 The integrated learning environment

The Suite serves two complementary purposes. As a repository, it makes selected IDEAL outputs and external resources findable in one learning environment. As a topic-driven collection, it places those resources in a sequence of questions, introductory explanations, research insights, practical materials, and activities. Users can consult a particular resource, explore a whole topic, or combine material from several topics for a course or pilot. Users can follow their own interests and needs rather than a fixed course sequence.

The IDEAL Learning Suite contains six AI topic courses, each with stated learning goals and competence types, plus separate courses on COL & V and LEVEL5. The topic courses use explanatory labels, resources, external links, pages, forums, quizzes, and, in Topic 6, feedback activities. The two method courses offer a deeper route into educational design and validation. Together these form a content offer and a method offer, which users can draw on together when planning a learning activity.

Project contribution	Expression in the Suite	Connection to practice
Research and earlier outputs	Frameworks, findings, readings and evidence inform topic content.	Users can interpret and apply these outputs in educational contexts.
WP3 CPD	Content and educational ideas developed during CPD are organised as reusable learning resources.	CPD and platform development informed each other.
WP4 platform	Courses, navigation, resource presentation and reflection or validation tools create workable access.	Educators can select, adapt and combine materials.
WP5 pilots	The platform provides a shared foundation for implementation.	Local adaptations and pilot reports can inform future examples and improvements.

This relationship developed across the work packages. WP3 CPD helped establish the content and educational approach; WP4 made them accessible in a usable environment; and WP5 applies that foundation in different pilot settings. The experiences and reports from the pilots can also inform future examples and improvements to the Suite.

1.1 Platform access for review

A demonstration account gives partners, evaluators and other stakeholders access to the current IDEAL learning environment. Visitors can explore the course structure, learning modules and materials, and see how the competence-oriented approach is organised. The platform is designed for use on desktop and mobile devices. This account is intended for read-only evaluation, familiarisation and demonstration.



[Open the IDEAL learning platform (https://ideal.q21.de/)](https://ideal.q21.de/)

Username: tron

Password: IDEALisGR8!

1.2 Further components of the Suite

The Moodle profile serves as the main page of each user's e-portfolio. Users can attach examples of their work, written reflections, LEVEL5 certificates and other materials as downloadable documents. Using the profile for this purpose replaces the separate Mahara component foreseen in the application. Learners can keep their records in the same environment in which they work, and administrators have one fewer system to maintain.

The Learning Blueprint course helps facilitators turn the project's training formats into activities they can run in their own settings. Separate units describe the continuing professional development (CPD) course and the Datathon. Facilitators can use them to see how each format is organised and decide what to retain or adapt for their participants, available time and local needs.

SPIDER is available in all partner languages, while the LEVEL5 assessments are available mainly in English. English was the shared working language for trainers involved in the CPD and the pilots. Using it for reports, materials and day-to-day communication helped trainers exchange experiences across the partnership. The assessment language follows this common practice.

SPIDER helps users reflect and decide what to explore next. Where participants undertake a LEVEL5 assessment, they can document development with written reasoning and evidence from a learning activity. Q21 issues certificates through the LEVEL5 validation system. The software can generate certificates in all partner languages, but participants requested English versions to match the project's working language. Section 4.3 explains how assessment and validation relate to the learning activity.

The Suite is free to use. Learners register for an individual Moodle account so that they can work in a secure environment and return to their own profile and learning records. Section 1.1 describes the demonstration route for reviewers. The Suite will remain available for at least two years after the project ends. Course backups can be provided on request to organisations that want to reuse or adapt the courses in their own Moodle environment.

The consortium publishes the materials it creates as Open Educational Resources under the Creative Commons CC BY-NC-SA 4.0 licence. When a course draws on an external reading, video or other resource, that resource retains its own conditions of use. This distinction matters for facilitators who want to adapt a course or share it in another setting.

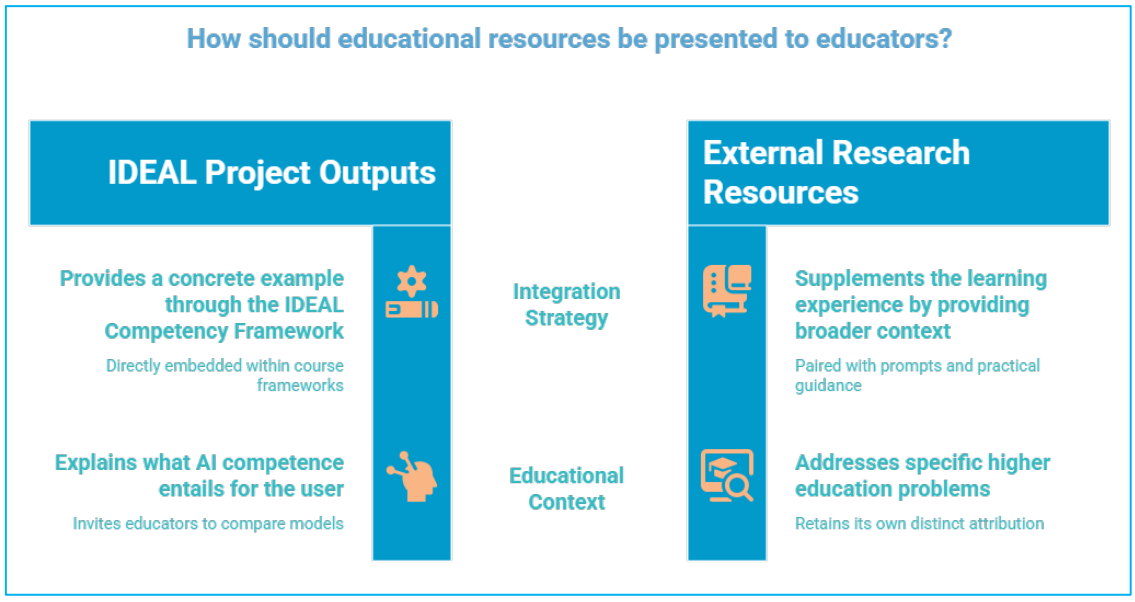
The Suite runs on Moodle and can be used on desktop and mobile devices. This gives learners the option of consulting a resource on the move or returning to the same course on a desktop when preparing an activity or writing a reflection.

2 Development and organisation of the offer

2.1 From research to a learning resource

Project research becomes more useful to educators when it is placed next to questions they face in teaching. Topic 3 provides a concrete example. Its Frameworks and Competencies course includes the IDEAL Competence Framework as a named resource alongside other AI and digital competence frameworks. The surrounding introductions explain what AI competence entails and invite educators to compare models and consider their own curriculum. The platform thus offers both access to a project output and a context in which to interpret it.

The same design principle applies elsewhere: a source is introduced, related to a higher education problem, and paired where appropriate with prompts, practical guidance, or a recap. The courses bring IDEAL outputs together with relevant external research and policy resources, with each retaining its own attribution.



2.2 WP3 content and WP4 access

WP3 CPD contributed to the development and establishment of the content and the wider educational approach. WP4 turns this work into a persistent, navigable offer. Topic headings, introductory labels, resource groupings, activities and links give users several entry points. Their organisation helps users see why a resource matters and how it can support reflection or action.

2.3 A common structure for the six topics

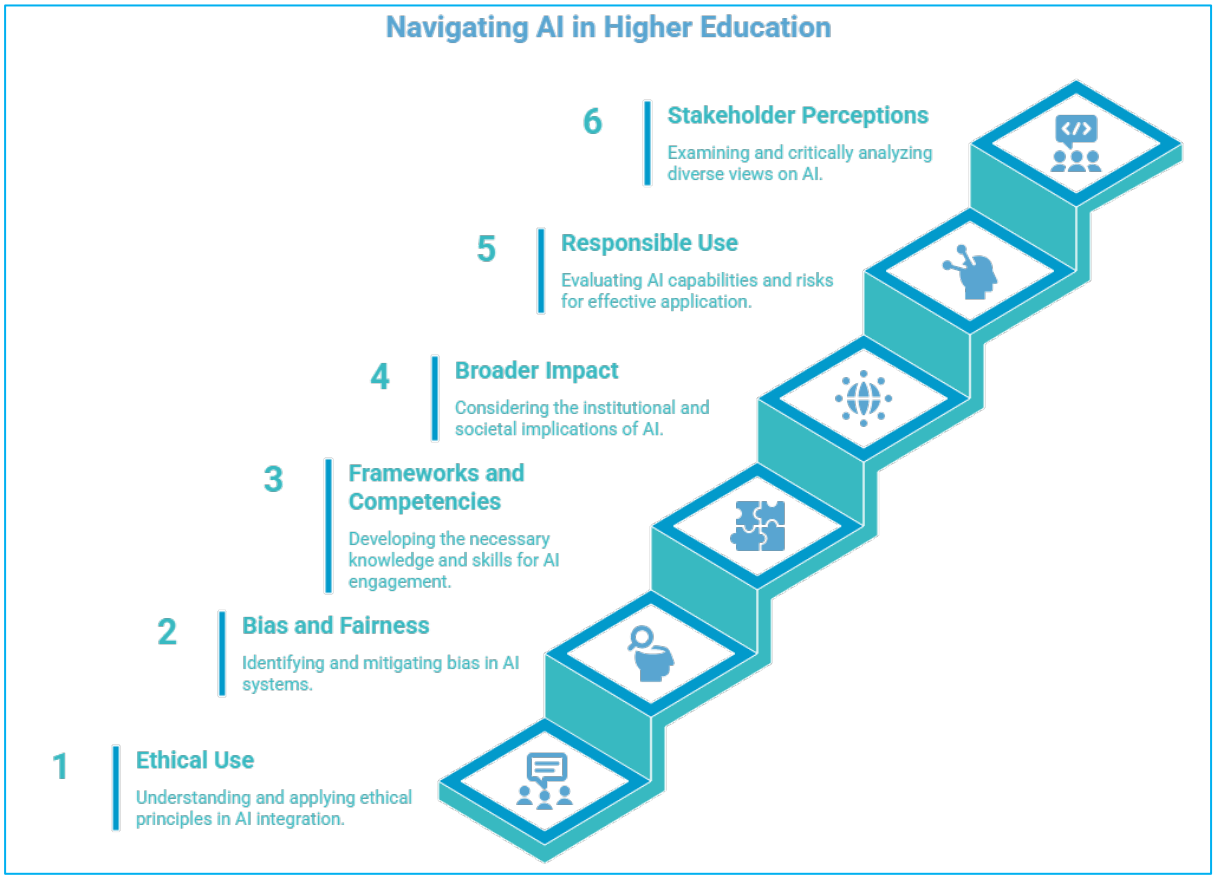
The six AI topics follow a broadly shared teaching pattern. It gives users an entry point, names the intended learning, provides material for exploration, and closes with practical application and a recap. The seven elements below make this common architecture visible.

1. Introduction: Orients users to the topic and its relevance to higher education.
2. Learning Goals and Competencies Addressed: States what users should be able to understand or consider.
3. Introductory Material: Provides a first explanation and accessible entry points.
4. Research Insights: Collects selected studies, frameworks and other evidence for further exploration.
5. Video Discussion: Offers another format or a question for discussion, where included.
6. Practical Tips: Connects the topic to choices in teaching, learning or institutional practice.
7. Lesson Recap: Invites users to revisit the main points, sometimes through a quiz.

The pattern is flexible. Topic 4 adds a distinct institutional policy section, Topic 5 separates educator and learner perspectives, and Topic 6 includes feedback activities. The Research Insights sections present selected material for exploration. The separate COL & V and LEVEL5 courses use their own method-oriented structures, described in Chapter 4.

3 The six AI related topics

The following descriptions present the six topic courses shown in the IDEAL Learning Suite. Each summary introduces the topic, its materials and a possible use in higher education.



3.1 Topic 1 Ethical Use of GenAI in Higher Education

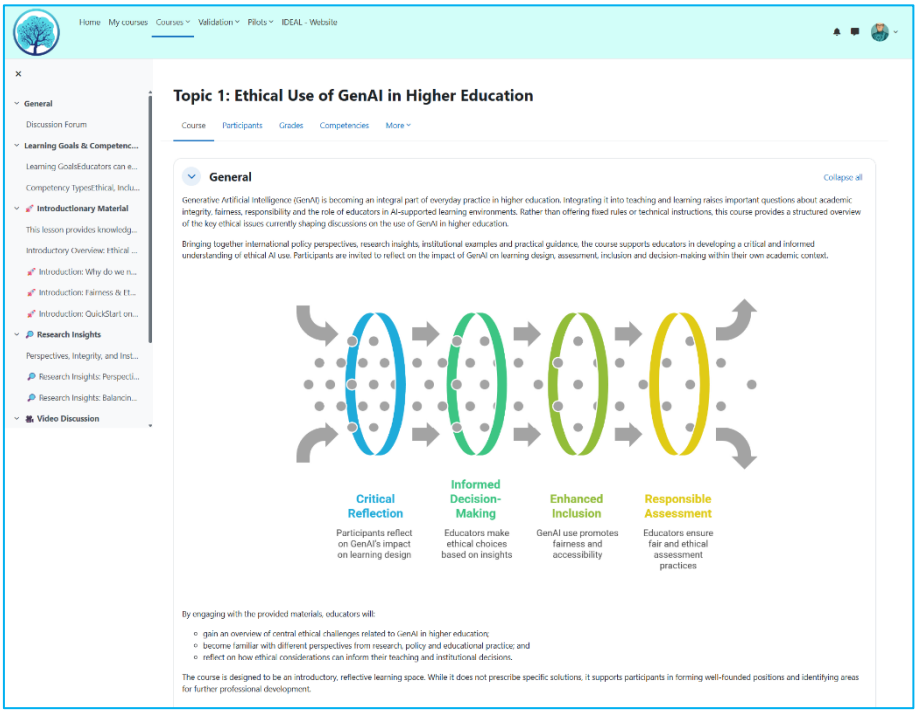
Open this course on the IDEAL platform

Guiding question: How can generative AI be used in higher education while respecting fairness, integrity, responsibility and inclusion? The course introduces ethical and responsible AI, data protection and value-sensitive teaching. It asks educators to evaluate the ethical consequences of different uses and to relate examples of inclusive AI integration to their own practice.

After the learning goals, introductory materials address why AI ethics matter and provide a quick start to ethical use. The research section brings together student and educator perspectives with work on

balancing innovation and academic integrity. A video discussion poses the direct teaching question of whether students should use GenAI in courses. Practical tips for teachers and a repeatable lesson recap quiz provide ways to move from debate to decisions in a particular teaching context.

The course can support a discussion of permitted AI use in an assignment: an educator can identify the learning goal, consider authorship and transparency, examine who may be disadvantaged, and then formulate guidance that students can understand. The Moodle content offers the questions and resources; a local policy or assessment rule must still be decided by the institution or educator.



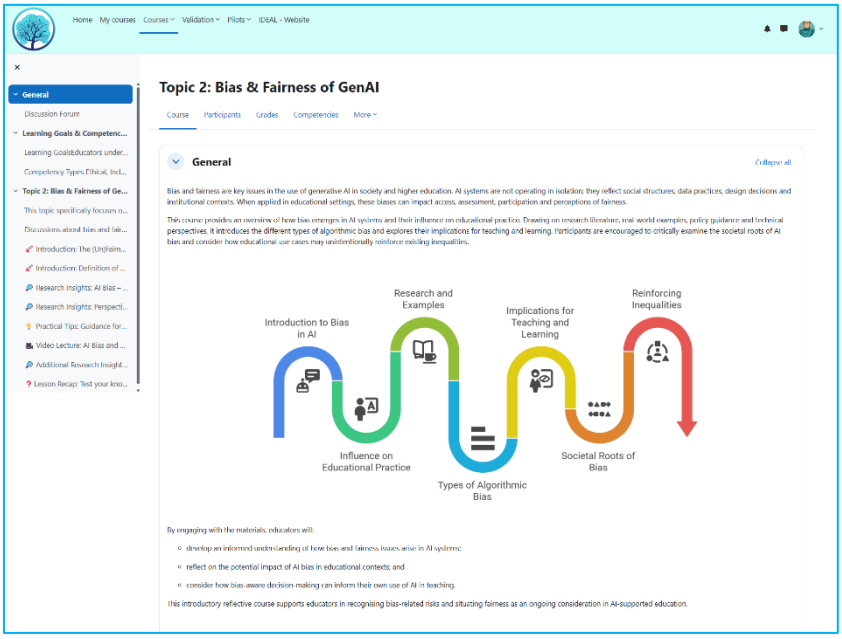
3.2 Topic 2 Bias and Fairness of GenAI

Open this course on the IDEAL platform

Guiding question: Where does bias arise in AI systems and how can educators recognise and respond to it? The stated goals include understanding types and sources of bias, spotting biased output, giving learners the context to interpret it, and examining fairness in one's own use of AI.

The course combines an introduction to algorithmic bias with examples such as unfair hiring algorithms. It links social structures, datasets, design decisions and contextual use, rather than treating bias as a purely technical defect. Research and a technical video on AI bias are accompanied by guidance for generative AI in education and an additional example concerning social robots. A recap quiz closes the topic.

For educational use, this topic supports a practical comparison: learners can inspect an AI-generated response for whose experiences are represented, what data or assumptions may be missing, and how the output might affect a teaching decision. This is one way an educator could apply the course's themes in a local learning activity.



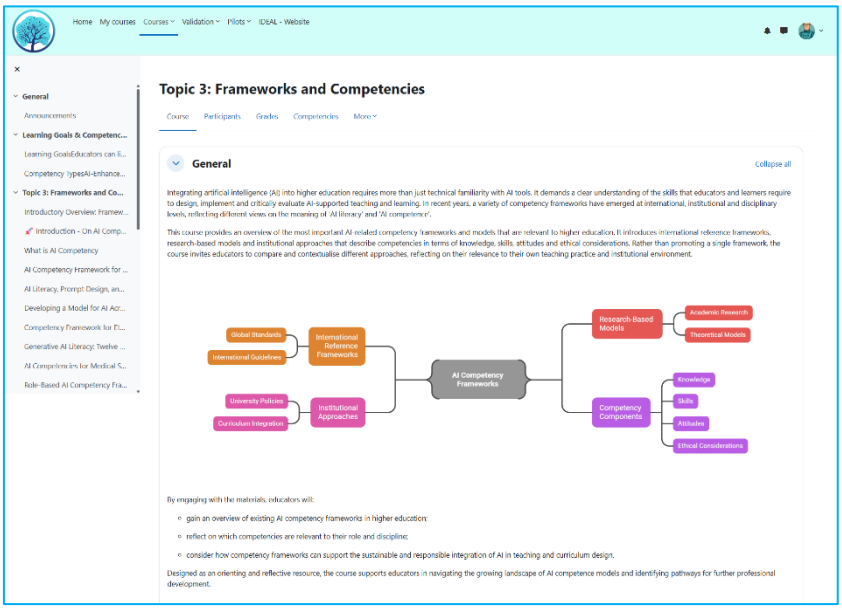
3.3 Topic 3 Frameworks and Competencies

Open this course on the IDEAL platform

Guiding question: What knowledge, skills and attitudes do educators and learners need to engage with AI responsibly? The course defines AI competence as more than tool operation. Its introductory page connects technical understanding, pedagogical adaptation, ethical judgment and critical reflection.

A first section introduces a range of AI competence perspectives and applications, including teacher frameworks, AI literacy, curriculum design and role-specific models. The second substantive section provides a conceptual orientation and a research page on competency frameworks. Its curated resources include the IDEAL Competence Framework, DigCompEdu, A-Lit, SAMR, ALiF, TPACK-AI and other higher education frameworks, plus practical tips for teachers. The recap is delivered as a page linking to an external quiz rather than as a Moodle quiz activity.

The topic encourages comparison and selection. An educator can use the IDEAL framework to define an intended competence, compare it with another model, then decide which dimensions belong in a course activity and what evidence would show development. A framework does not itself prescribe a teaching method; COL & V and LEVEL5, described later, help connect the competence description to a learning process and reflection.



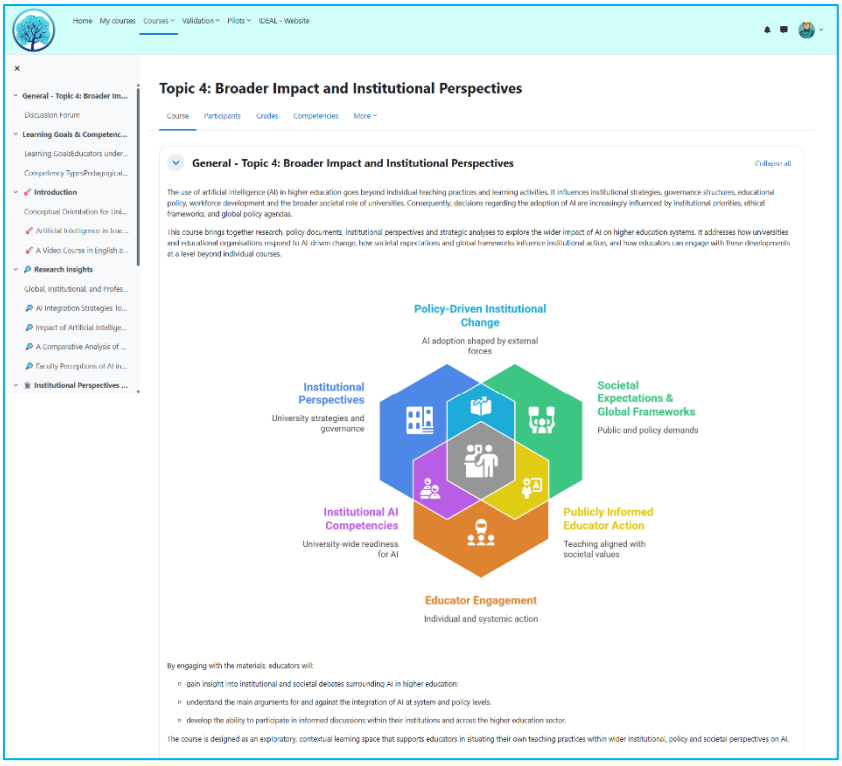
3.4 Topic 4 Broader Impact and Institutional Perspectives

Open this course on the IDEAL platform

Guiding question: What changes when AI is considered as an institutional and societal issue rather than a tool used by an individual teacher? The learning goals concern the broader effects of AI and the ability to participate in discussions within and across institutions.

The course begins with AI in teaching, learning and institutional processes. Its research section brings in education goals, skills development, comparative studies and faculty perceptions. A distinct section on institutional perspectives and policies then addresses governance, strategy and structural responsibility. It includes resources on data governance, higher education policy examples and a page surveying university AI policies. Additional material links AI with open educational resources and wider economic and societal impacts; a recap quiz follows.

The topic helps an educator move from a classroom idea to institutional questions: which data may be used, whose responsibility it is to set boundaries, what support staff need, and how policy affects assessment and equity. It can also help institutions see why individual experimentation requires governance and professional support.



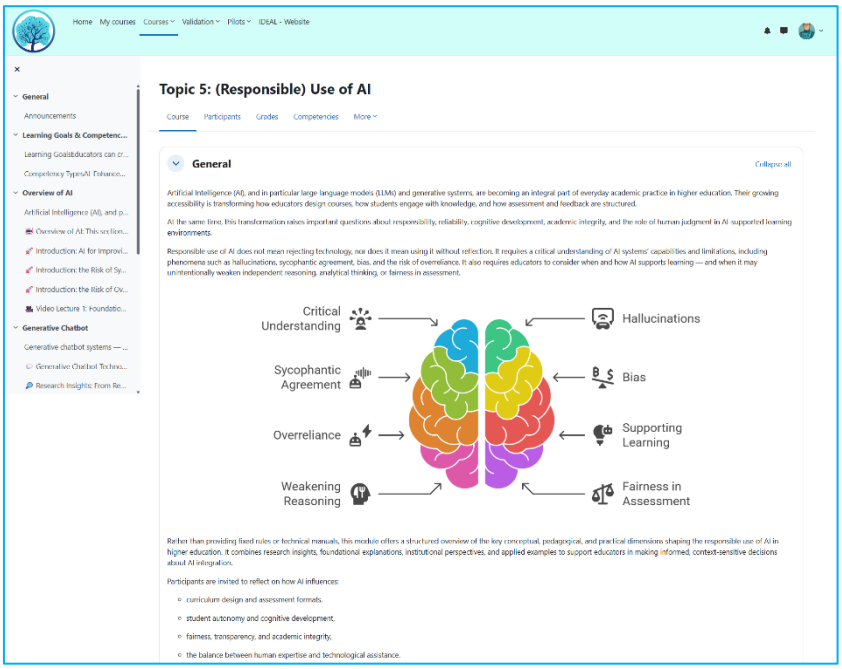
3.5 Topic 5 Responsible Use of AI

Open this course on the IDEAL platform

Guiding question: What can AI systems do in teaching and learning, where do they fall short, and how can users decide when their use is appropriate? The course is organised into four substantive sections: Overview of AI, Generative Chatbot, For Educators, and For Learners. Its goals ask educators to evaluate capabilities and risks and develop teaching offers with purposeful AI use.

The overview introduces AI, large language models, learning opportunities and challenges, including sycophancy and overreliance. The chatbot section discusses educational and experimental uses alongside technical and pedagogical limits. The educator section includes foundational guidance, a guidebook, prompt patterns and teaching strategies. The learner section addresses critical use of AI in study, including prompting guidance, and ends with a recap quiz.

The separation of educator and learner perspectives is important. A teacher deciding whether a chatbot can support feedback faces design and assessment questions; a student using one to prepare for an examination faces questions about understanding, dependency and academic responsibility. The course allows both perspectives to be considered within one topic without assuming that they have identical needs.



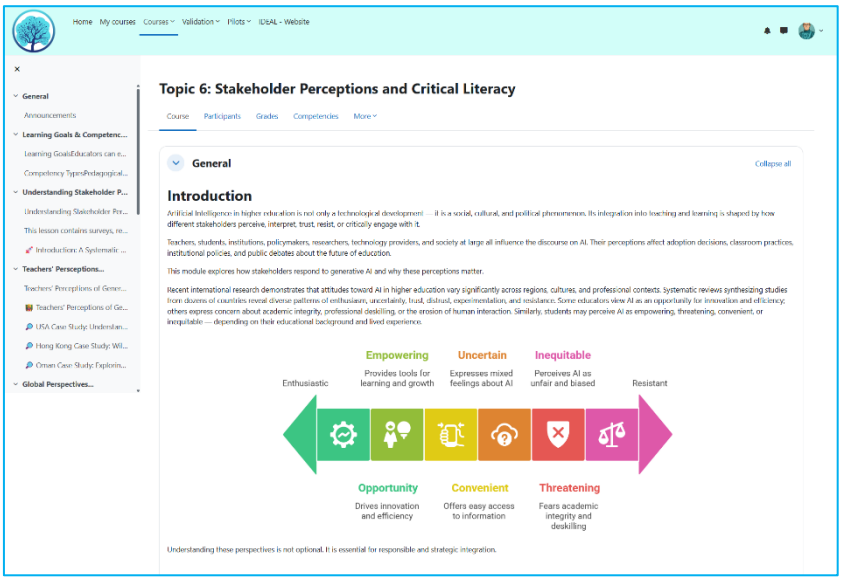
3.6 Topic 6 Stakeholder Perceptions and Critical Literacy

Open this course on the IDEAL platform

Guiding question: How do different groups perceive AI in higher education, and how can those perceptions be examined critically? The course explicitly broadens the view beyond technical use to social, cultural and political contexts. It asks educators to recognise relevant stakeholders, involve them in developing AI-supported learning, and teach critical AI literacy.

The sections move from stakeholder and societal contexts to studies of teachers' perceptions and students' perceptions in several countries. A reflective activity asks users to examine historical analogies used in public debate about AI. A critical literacy section addresses knowledge, representation, power, privacy, bias and accountability. A second feedback activity invites a comparison of benefits and costs for an AI-supported educational task, followed by a recap quiz.

These activities make the topic especially suitable for discussion in a CPD group or pilot team. An educator can compare the expectations of students, colleagues and institutional leaders, test whether a familiar analogy clarifies or distorts the issue, and weigh benefits against costs in a specific teaching scenario. This makes different assumptions visible and supports a more informed discussion of AI in education.



4 Educational concept and competence development

4.1 COL & V as the educational frame

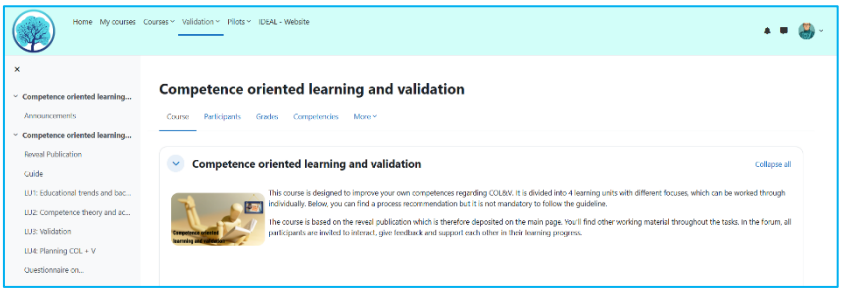
Open this course on the IDEAL platform

Competence-oriented learning and validation (COL & V) connects content to action in context. A participant starts with a meaningful challenge, uses relevant resources, applies an idea in teaching or learning, reflects on the experience and identifies evidence of development. It gives the topic resources a role in a learning process. It also leaves room for different users to enter at different topics and to choose activities appropriate to their discipline and institution.

The separate COL & V Moodle course makes this approach available as four learning-unit books: Educational trends and background; Competence theory and acquisition; Validation; and Planning COL & V. The course introduction says that participants may work through the units individually and that its suggested process is not mandatory. A REVEAL publication and a course guide provide supporting reading. The books combine explanations with tasks, embedded H5P elements and prompts to design an educational offer, examine competence development, consider validation purposes and steps, and plan a case of one's own.

The COL & V course is a methodology resource alongside the six AI topics. It helps educators choose a competence, design a learning pathway suited to their context and decide what evidence to collect. Partners can use this frame when adapting topic materials for their own learning activities.

For example, an educator concerned about student dependence on chatbots could begin in Topic 5, examine overreliance and learner guidance, design a small classroom activity, and ask students to explain when AI helped or hindered their understanding. Topic 1 could then inform the rules for responsible use, Topic 2 could add a fairness lens, and Topic 6 could support discussion of differing perceptions. This example shows how the available materials can be combined for a local activity.

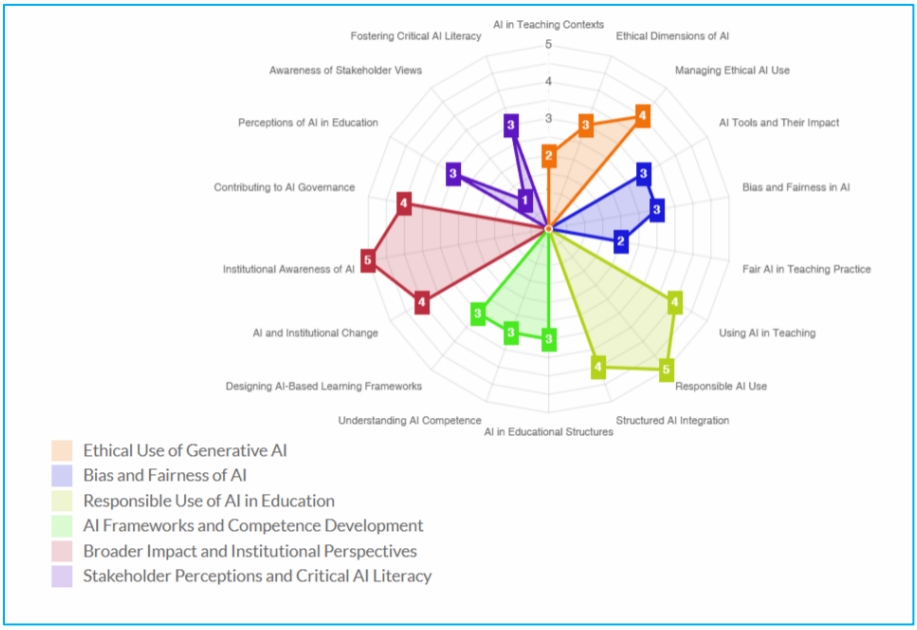


4.2 SPIDER for awareness and orientation

The three live IDEAL SPIDER questionnaires make the awareness function explicit. Each introduction says the exercise is not a test and presents the resulting profile as a way to identify areas of confidence and further exploration. The introductory educator version says it takes about 10 to 12 minutes, covers six key areas of AI integration, and links the profile to relevant IDEAL learning modules. Its first area, ethical use of generative AI, combines an intuitive slider with statements about current practice and professional positioning. The student and administrative versions describe two short steps per section. SPIDER is based on the LEVEL5 approach and focuses on self-reflection rather than formal validation.

Version	Audience and reflective focus	Stated output
IDEAL intro	Educators reflect on six areas of AI integration in teaching, assessment and research.	A SPIDER profile with strengths, development areas and links to relevant modules.
IDEAL students	Students reflect on AI use in study, evaluation of information and data, and responsible academic work.	A profile indicating confidence and possible further IDEAL resources.
IDEAL uni	Administrative staff reflect on AI use at work, information and data evaluation, and responsible practice.	A profile indicating confidence and possible further IDEAL resources.

The introductory questionnaire describes a direct link from its profile to platform content, so topic guidance is part of its stated user experience. The questionnaire presents these links as a way to guide further exploration. The student and administrative versions explicitly include information and data evaluation alongside AI use; the educator introduction places stronger emphasis on AI integration while naming data-driven practice. The three versions address different roles and help users recognise topics worth exploring. A SPIDER profile supports awareness and orientation; a separate assessment can document competence development.



4.3 LEVEL5 assessment and validation

Open this course on the IDEAL platform

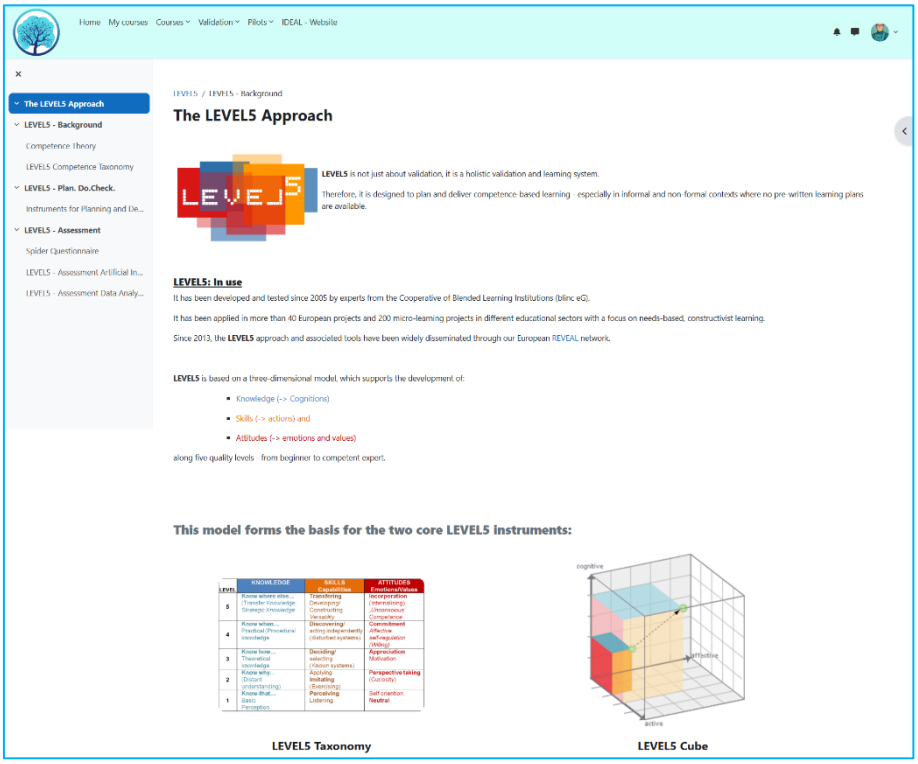
The separate LEVEL5 Moodle course presents the approach as a learning and validation system. Its background section covers competence theory and taxonomy. Plan–Do–Check then starts from an action field, defines a contextual learning field and reference system, designs a pathway, and checks learning through identification, documentation, assessment and, where applicable, certification. The course describes the LEVEL5 taxonomy as a three-dimensional reference system for Knowledge, Skills and Attitudes at five quality levels, and the LEVEL5 cube as a way to visualise development.

The assessment section contains a Spider Questionnaire page and two H5P activities named LEVEL5 Assessment Artificial Intelligence and LEVEL5 Assessment Data Analysis. The packaged H5P content shows the same broad sequence in both: project details; a description of the relevant competence; initial and later self-assessments for Knowledge, Skills and Attitudes; and a concluding account of development. Each dimension prompts a level selection and written reasoning. The two packs explicitly address responsible AI integration and critical data analysis and validation in higher education, respectively. The use of these assessments in the pilots is described in the WP5 Experiences Reports. The six content topics and the SPIDER variants focus mainly on AI, while these two assessments explicitly cover both domains.

Where an assessment is carried out, a participant can record an initial rating with reasoning, undertake a learning activity, and return to the competence with a later rating and evidence. The reasoning and

examples matter as much as the numerical change: a higher rating without an explanation says little about what was learned or applied.

In this architecture, SPIDER supports awareness and orientation, while a separate LEVEL5 assessment can document development. An educator or facilitator may help participants interpret the reference system and discuss evidence; the exact assessment and certification process depends on the implementation used in each pilot. Formative self-reflection, documented assessment, validation of learning, and certification describe distinct steps and outcomes.



5 From the Suite to WP5 pilots and back

Open the pilots area on the IDEAL platform

The Suite provides a common basis for pilot implementation: six topic areas, curated resources and activities, a competence-oriented educational frame, and reflection or assessment tools. Pilot partners can select content that fits their participants, discipline and institutional conditions. Such adaptation is a strength if the selected competence, learning activity and evidence are documented clearly enough for others to understand what happened.

A possible pilot pathway begins with a SPIDER version that raises awareness or helps select a topic. Educators then choose and adapt content, introduce a learning challenge and gather reflections during implementation. Where LEVEL5 assessment forms part of the pilot, initial and later ratings and reasoning document perceived development. Pilot reports describe the context, decisions, evidence and limitations. Partners can adapt this pathway to their context and document the steps they actually used.

A collection of pilot examples on the platform makes this connection more visible. A concise entry could state the context and target group, selected topic and resources, learning activity, use of COL & V and LEVEL5, adaptations, lessons, and a link to the full partner report. Such a collection helps later users see how the same shared offer can work in different settings. The Pilots area of the Suite is the starting point for this collection; the detailed results are reported in WP5.

6 The IDEAL Learning Suite offer

The six topic courses provide a substantive collection with introductions, curated evidence, practical resources and several forms of activity. Topic 3 includes the IDEAL Competence Framework. The COL & V and LEVEL5 courses complete the platform offer, with four methodology units in the former and distinct AI and data analysis H5P assessments in the latter. The three live SPIDER questionnaires extend the offer with role-specific awareness and topic orientation for educators, students and administrative staff.

Three routes illustrate the offer. An individual educator can browse one topic to answer a teaching question. A course team can compare topics and frameworks, then design a learning activity and reflection process. A pilot team can combine topic content with SPIDER orientation and, where appropriate, LEVEL5 assessment. These routes show the flexibility of the platform offer; pilot reports provide the account of implementation and outcomes.

The platform brings together content, educational methods and tools for reflection and assessment. The WP5 pilot documentation provides the context for how partners applied them. The proposed collection of pilot examples makes those experiences easier to discover alongside the learning resources.



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