Co-funded by the European Union

EPD-Net

EPD-NET

Filling the Gap: Development of Ecological Planning and Design Learning Network and Adaptive Smart Training Module for Disaster Resilient and Sustainable Cities

SMART TRAINING MODULE, INCLUDING AN AI BASED SELF-EVALUATION SYSTEM AND LMS

This document addresses the operational implementation framework of Deliverable D3.2 by defining the digital learning architecture, Moodle-based course structure, multilingual training-materials repository, YouTube playlist pathways, EPD-Assist AI-supported self-evaluation layer, certification logic, access infrastructure and post-project sustainability protocol of the EPD-Net Smart Training Module.

“Moodle certifies. YouTube shows. Google Drive stores. EPD-Assist mentors. NBI supports nature-based decisions.”

EPD-Net Smart Training Module, including an AI-based Self-Evaluation System and LMS

Deliverable Code: D3.2
Work Package: WP3 – Training Module Development
Lead Institution: Başarsoft Bilgi Teknolojileri A.Ş. (BS)
Contributing Partners: All EPD-Net Beneficiaries
Submission Date: M15 - May 2026
Version: v04

Relationship with D3.1 and D3.3

D3.2 should be read as the operational digital counterpart of the EPD-Net curriculum architecture. It is not a separate curriculum document, and it is not merely a technical description of platforms. Its correct interpretation depends on its position between D3.1 and D3.3.

D3.1 defines the pedagogical and curricular foundation of the EPD-Net Smart Training Module. It establishes the modular learning structure, topic catalogue, discipline-specific pathways, EQF orientation, learning outcomes, assessment logic and training-materials linkage. It explains what is taught, why it is taught, how topics are sequenced, and how the curriculum can be adapted for undergraduate, graduate, vocational and professional learning contexts. D3.1 therefore functions as the curriculum master document of WP3, not as a loose inventory of courses or materials.

D3.2 converts this curriculum architecture into a functioning digital learning system. It documents how the D3.1 curriculum is made accessible through Moodle-based topic courses, YouTube videos, Google Drive material repositories, EPD-Assist GPT, AI-supported self-evaluation, quiz-based completion rules, certification logic and QR/hyperlink access points. In this sense, D3.2 is the implementation layer where curriculum objects become digital learning objects, learning materials become accessible packages, and assessment rules become traceable evidence.

D3.3 then translates the curriculum and digital system into trainer and facilitator practice. It explains how trainers should use the Smart Training Module in delivery settings, how they should preserve the topic-level learning sequence, how Moodle, YouTube, Google Drive and EPD-Assist should be used, how target-group adaptation should be handled, and which quality safeguards must be maintained during training. D3.3 therefore does not replace D3.2; it operationalises D3.2 for human delivery, facilitation and quality control.

The relationship can be stated directly: **D3.1 defines the curriculum; D3.2 defines the digital learning system; D3.3 defines the trainer implementation protocol.** These three deliverables form a single WP3 chain. D3.1 gives the pedagogical spine. D3.2 gives the digital infrastructure. D3.3 gives the delivery discipline required to use that infrastructure correctly.

This relationship is important for review and implementation. A reviewer should not assess D3.2 as if it were expected to reproduce the full curriculum narrative of D3.1. Nor should D3.2 be reduced to a list of links or platform names. Its purpose is to demonstrate that the curriculum defined in D3.1 has been transformed into a structured, multilingual, evidence-bearing and sustainable digital learning environment. Similarly, trainers should not use D3.2 alone as a teaching guide. They should use D3.1 for curriculum meaning, D3.2 for system access and evidence logic, and D3.3 for delivery practice.

For this reason, the core quality standard of D3.2 is traceability across the WP3 chain. Each topic-level course should remain connected to the D3.1 curriculum identity, the D3.2 Moodle/video/material/assessment infrastructure, and the D3.3 trainer guidance. When this chain is preserved, the Smart Training Module can be reviewed not as a scattered digital repository, but as a coherent curriculum-to-platform-to-delivery system.

Introductory Remarks

0.1 Purpose and Contractual Position of the D3.2 Report

This report presents Deliverable D3.2, **Smart Training Module, including an AI-Based Self-Evaluation System and LMS**, within Work Package 3, Training Module Development. Its purpose is to document the operational infrastructure through which the EPD-Net curriculum is transformed into a functioning, multilingual and evidence-bearing digital learning system. The report should not be read as a printed archive of training files. Such an approach would be technically excessive and pedagogically weak. D3.2 is a web-based application deliverable; its quality depends on access, structure, traceability, learner progression, assessment logic and post-project sustainability.

The deliverable occupies a precise position in the WP3 chain. D3.1 defines the curriculum architecture, learning pathways, competence logic, EQF orientation and training-materials framework. D3.2 operationalises that architecture through Moodle, YouTube, Google Drive repositories, EPD-Assist GPT and AI-supported self-evaluation. D3.3 explains how trainers and facilitators should use this system in structured delivery settings. D3.2 therefore stands between curriculum design and training practice. It is the digital layer where curriculum objects become accessible courses, video-supported lessons, multilingual materials, assignment tasks, quiz-based self-evaluation, completion records and certificates.

This distinction matters. A large number of files does not automatically prove the existence of a smart training module. The EPD-Net material base now includes thousands of learning files: PowerPoint presentations, translated slides, transcripts, open-ended assignments, quiz banks, video scripts, repository links and Moodle course objects. If these materials were simply inserted into the report, the result would be unreadable and quickly obsolete. The stronger reporting logic is different: the report documents how the files are structured, where they are accessed, how they are linked to the curriculum, how learners progress through them, how self-evaluation operates and how completion evidence is generated.

0.2 From Curriculum Architecture to Digital Learning System

The core of D3.2 is the translation of the EPD-Net curriculum into an operational digital environment. D3.1 establishes the formal curriculum catalogue through thirty-five modules and one hundred and five topic entries. D3.2 expands this curriculum into **147 Moodle-based course objects**. This difference is intentional and should not be interpreted as a contradiction. The 147 Moodle course objects include the curriculum topics defined in D3.1 together with introductory, case-based, capstone, programme-specific and implementation-oriented learning units required for LMS delivery. In other words, D3.1 defines the curriculum spine; D3.2 converts that spine into teachable, trackable and certifiable digital course objects.

The topic code remains the basic unit of traceability. Each Moodle course object, video, transcript, PowerPoint file, assignment, quiz bank, repository folder and certificate rule should be linked back to a stable topic identity. This allows the system to remain intelligible despite its scale. A learner may enter through a Moodle course, a YouTube playlist, an EPD-Assist recommendation or a Google Drive material link. The route may differ, but the underlying curriculum object must remain stable. This is the condition that prevents a distributed digital system from becoming a scattered archive.

The Smart Training Module is therefore built as a controlled digital ecosystem. Moodle manages formal learning progression, assignment submission, quiz access, pass threshold and certificate generation. YouTube hosts the video layer and programme-based playlists. Google Drive stores the multilingual material packages that cannot be reproduced proportionately in the report. EPD-Assist GPT provides academic mentoring, multilingual explanation, learning-pathway guidance and formative self-evaluation. QR codes and hyperlinks create direct access points for reviewers, trainers, learners and dissemination contexts.

0.3 Rationale for a Distributed Digital Infrastructure

The use of Moodle, YouTube, Google Drive and GPT-based support is not an improvised convenience. It is a deliberate infrastructure strategy. The project had to solve four practical problems at once: large file volume, multilingual access, learner evidence and post-project sustainability. No single tool performs all these functions well. Moodle is strong for sequencing, assessment and certification. YouTube is strong for video dissemination and subtitle-supported access. Google Drive is practical for storing and sharing large numbers of learning files. EPD-Assist GPT adds adaptive academic support that static repositories cannot provide.

A fully centralised platform might appear cleaner, but it would create fragility. It would increase storage pressure, maintenance cost and post-project dependency. The chosen architecture distributes functions while preserving control through topic codes, Moodle progression rules, repository links and access registers. This is especially important for a public Erasmus+ deliverable expected to remain useful after the funded period. The project's digital choices therefore serve sustainability: they reduce avoidable hosting burdens, widen access, support multilingual dissemination and allow materials to be maintained without turning the report into a static file dump.

This approach has a clear boundary. Public access and formal completion are not the same. A learner may watch videos through YouTube and download materials from Google Drive, but certified topic completion is generated through Moodle. EPD-Assist may help the learner understand concepts, prepare for quizzes, structure assignments and generate additional formative practice; it does not replace Moodle's completion rules or trainer-mediated academic judgement. This boundary is a quality safeguard. It allows the project to use AI productively without inflating AI-generated interaction into formal certification.

0.4 Multilingual Access and Learning-Material Logic

D3.2 implements multilingual access at several levels. English PowerPoint materials and English transcript scripts form the production base for the training videos. These source materials support video generation, transcript preparation and YouTube subtitle functionality. Project-language materials are then provided through translated PowerPoint files, translated transcripts, open-ended assignments and quiz questions. The formal project-language layer covers Latvian, Slovak, Czech, English, Portuguese and Turkish, while YouTube automatic caption and translation functions extend informal video access to a broader language environment.

This distinction must remain explicit. YouTube auto-translation improves dissemination and accessibility, but it is not the official assessment language layer. Assessment-critical materials, including assignments, quiz questions, course instructions and certificate-bearing Moodle components, must remain under the controlled multilingual content structure. The English transcript and source materials

should function as semantic anchors, particularly for technical terms such as ecological planning, resilience, vulnerability, exposure, adaptive capacity, green-blue infrastructure, ecosystem services, AI-supported risk mapping and nature-based solutions.

The Google Drive repositories hold the large multilingual material base. Because the total file volume exceeds the capacity of a single free Google account, the repository is distributed across three accounts. This should be reported openly as a storage and sustainability decision. The distribution does not divide the curriculum. It divides storage. The learner-facing system remains coherent as long as topic codes, Moodle links, YouTube descriptions and repository folders are maintained together.

0.5 Learning Progression, Self-Evaluation and Certification

The Moodle learning flow is designed to prevent superficial completion. Each learner enters a topic-level course and first encounters the embedded YouTube video. The learner then accesses the PowerPoint presentation and transcript. The open-ended assignment becomes available only after the required preparatory learning objects have been completed. The quiz becomes available after the assignment has been submitted. This progression protects the pedagogical sequence: concept, method, learner production, self-evaluation and completion evidence.

The quiz system provides the formal self-evaluation and completion mechanism within Moodle. Each formal Moodle quiz attempt presents ten questions, each worth ten points. The pass threshold is 60 out of 100. Each learner has three formal attempts to reach the threshold. Questions are drawn randomly at each attempt, and answer options are also randomised. This rule must be stated identically in the Moodle course information text, learner guidance, trainer guidance and D3.2 report. Unlimited practice may be generated through EPD-Assist for formative preparation, but such practice is not a formal Moodle quiz attempt and does not produce certification evidence.

The certificate generated by Moodle should be interpreted proportionately. It certifies completion of a specific topic-level course under defined platform rules. It should not be overstated as a full programme qualification unless a separate aggregation and recognition framework is formally established. This restrained interpretation strengthens the deliverable. It keeps the certificate claim aligned with the evidence actually produced: activity progression, assignment submission, quiz success and Moodle completion record.

0.6 Evidence Logic and Reviewability

D3.2 should be evaluated through system evidence, not file mass. The correct evidence package includes Moodle course examples, access links, QR codes, YouTube playlist structures, Google Drive repository links, EPD-Assist GPT access, sample progression rules, quiz configuration evidence and certificate examples. These elements demonstrate that the Smart Training Module operates as a digital learning system. Printing thousands of files would not prove that.

The report therefore uses a layered evidence model. The main chapters explain the architecture, platform roles, Moodle progression, EPD-Assist self-evaluation, repository structure, playlist pathways, certification logic and maintenance protocol. Appendix 1 provides digital access points and QR codes. Appendix 2 provides the playlist and repository index. Together, these components make the system reviewable without collapsing the report into an unmanageable file inventory.

The strongest test of D3.2 is traceability. A reviewer should be able to follow a topic from curriculum identity to Moodle course, from Moodle course to embedded video, from video to supporting materials, from materials to open-ended assignment, from assignment to quiz, and from quiz success to certificate. If this route is visible and functional, D3.2 is defensible.

0.7 Quality Risks and Controls

The main quality risk of D3.2 is not lack of content. The risk is digital drift. Links may break, repository folders may move, video descriptions may become outdated, Moodle rules may change, translated files may diverge, quiz banks may be revised without version notes and AI guidance may move beyond validated material. These risks are normal in a distributed digital system. They are manageable only if the project maintains topic-code discipline, link registers, version control and periodic checks.

The AI layer requires particular care. EPD-Assist GPT strengthens the module by offering multilingual mentoring, formative self-evaluation, quiz preparation, case-task generation and learning-pathway guidance. Yet its outputs must remain formative. The system should not claim that AI-generated feedback certifies competence. Formal completion is produced in Moodle, and higher-order academic judgement remains human-mediated where assignments involve design reasoning, case interpretation, risk analysis or professional synthesis.

A second risk is credential inflation. Topic-level certificates are valuable because they are granular, trackable and automatically generated after completion. Their value declines if they are described as broader than they are. D3.2 should therefore distinguish topic completion, playlist completion, programme pathway completion and formal qualification recognition. This distinction is essential for later Europass alignment and for institutional adoption.

0.8 Reading Logic of the Report

Chapter 1 defines the contractual position, system scope and delivery logic of D3.2. It explains why the deliverable should be understood as a web-based application rather than as a printed repository of materials.

Chapter 2 presents the digital learning architecture and access infrastructure. It clarifies the role of Moodle, YouTube, Google Drive, EPD-Assist GPT, the project website and QR/hyperlink layers within a distributed but controlled system.

Chapter 3 focuses on Moodle course structure and learner progression rules. It explains how 147 topic-level course objects are organised through video access, PPTX and transcript review, open-ended assignment submission, quiz access and certificate generation.

Chapter 4 defines EPD-Assist GPT as the AI-supported academic mentoring and self-evaluation layer. It explains the system's role in concept clarification, learning-pathway guidance, assignment support, quiz preparation, case-study generation and multilingual mentoring.

Chapter 5 explains the training-materials repository and multilingual content layer. It justifies why thousands of files are kept in live repositories rather than reproduced inside the report, and it explains the topic-level material package.

Chapter 6 presents the YouTube playlist architecture and programme-based learning pathways. It shows how the video layer creates accessible routes for city and regional planning, landscape architecture, civil engineering, architecture, vocational education, local government and other user groups.

Chapter 7 defines completion, certification and evidence logic. It explains what counts as learning evidence, how quiz rules operate, how certificates are generated and how topic-level recognition should be interpreted.

Chapter 8 presents the sustainability, maintenance and post-project access protocol. It defines link governance, repository maintenance, version control, access roles and continuity risks.

Appendix 1 provides digital access points and QR codes. Appendix 2 provides the playlist and repository index.

0.9 Concluding Orientation

D3.2 demonstrates that the EPD-Net Smart Training Module has moved beyond curriculum design into operational digital delivery. Its contribution is not the accumulation of files, but the conversion of those files into a structured, multilingual, AI-supported and assessment-bearing learning environment. Moodle provides the formal course and evidence layer. YouTube provides the audiovisual dissemination layer. Google Drive preserves the large multilingual material base. EPD-Assist GPT adds adaptive academic mentoring and formative self-evaluation. QR codes and access registers make the system inspectable.

The central standard remains traceability. Every topic-level course must remain linked to its curriculum identity, video object, material package, assignment task, quiz rule and certificate record. If this discipline is maintained, D3.2 can be defended as a functioning smart training module rather than a dispersed collection of digital assets. This is the level of evidence expected from a web-based Erasmus+ deliverable that must remain usable, auditable and sustainable after the project period.

Chapter 1. Contractual Position, System Scope and Delivery Logic

1.1 Contractual Position of D3.2

D3.2 is the infrastructure deliverable of Work Package 3. Its formal title, Smart Training Module, including an AI based self-Evaluation System and LMS, places it at the point where curriculum, content, digital access and learner evidence become operational. The deliverable is not a static catalogue of files. It is the web-based application layer through which the EPD-Net curriculum is delivered, navigated, assessed and documented in Latvian, Slovak, Czech, English, Portuguese and Turkish. This distinction is decisive for acceptance. A file archive may contain educational material; D3.2 must show that those materials are organised as a functioning learning system.

The contractual chain is clear. D3.1 defines the curriculum and training-materials architecture. D3.2 converts that architecture into an adaptive smart learning module with LMS access and AI-supported self-evaluation. D3.3 then explains how trainers and facilitators should operate the module. D3.2 therefore carries a heavier burden than a repository. It must demonstrate that the 147 topic-level learning objects have been transformed into Moodle-based courses, video-supported learning sequences, downloadable multilingual materials, assignment gates, quiz-based completion rules, certificate generation and AI-aided academic mentoring.

The strongest implementation risk is not the absence of content. The risk is uncontrolled abundance. The project now contains thousands of derivative files: presentations, translated slides, transcripts, open-ended assignments, quiz questions, video records and repository links. Treating this volume as the deliverable would be a mistake. The evidence required for D3.2 is not bulk. It is traceability. Each digital object must be located through a curriculum topic, a course shell, a language layer, a learning activity and an assessment rule. This chapter defines that operating logic.

1.2 System Scope of the Smart Training Module

The D3.2 system is built around 147 topic-level Moodle courses. Each topic operates as a self-contained learning unit while remaining connected to the larger curriculum pathways defined in D3.1. This design gives the system a granular structure. A learner can enter through a programme-specific playlist, a Moodle topic, an EPD-Assist recommendation or a professional need; the underlying topic identity remains stable. The topic is therefore the central unit of delivery, retrieval, assessment and certification.

Five infrastructure layers carry the system. The Moodle layer manages enrolment, learning sequence, activity gating, quiz attempts, completion tracking and certificate production. The YouTube layer hosts the course videos and enables broad public access, including automatically generated subtitles supported by Google Translate for languages beyond the formal project languages. The Google Drive layer stores the multilingual material packages that are too numerous and too dynamic to reproduce inside a PDF report. The EPD-Assist GPT layer provides multilingual academic mentoring, learning-pathway orientation, self-evaluation support and generation of additional formative exercises. The QR and hyperlink layer gives reviewers, learners and trainers direct entry points into the system.

This distributed architecture is not a technical compromise. It is a sustainability decision. YouTube, Google Drive, Moodle and GPT-based guidance were selected because the Smart Training Module must remain usable after the funded implementation period without imposing avoidable hosting, storage or licensing burdens on the consortium. The design favours persistence, low-cost maintenance, discoverability and multilingual access. For an Erasmus+ public deliverable, this is a defensible choice, provided that access points, versioning rules and repository structure are documented with enough precision.

1.3 Digital Architecture and Entry Points

The D3.2 architecture should be read as a controlled digital ecosystem rather than as a single website. Moodle is the formal learning environment. YouTube is the video access layer. Google Drive is the material repository. EPD-Assist is the AI-supported guidance and self-evaluation layer. The project website and public links function as orientation points. These components are intentionally connected by topic codes, course titles, playlist structures and repository links placed in video descriptions and Moodle course sections.

The technical logic is straightforward. The learner normally enters a topic course in Moodle. The first object encountered is the embedded YouTube lesson video. The learner then accesses the multilingual learning package, including the PowerPoint presentation and transcript. The open-ended assignment becomes available only after the required preparatory objects have been completed. The quiz becomes available only after the assignment has been submitted. Completion is therefore not reduced to video viewing. It is a gated sequence that moves from exposure to material review, from material review to written production, and from written production to scored assessment.

Table 1.1. Core digital layers of the D3.2 Smart Training Module

Layer	Primary Function	Evidence Produced	Quality Control Point
Moodle LMS	Hosts 147 topic-level courses and controls learning progression.	Course access records, activity completion, assignment submissions, quiz scores, certificates.	Topic identity, sequencing, quiz settings and certificate rules must remain stable.
YouTube	Hosts and embeds lesson videos with subtitle support.	Video availability, playlist structures, public channel records.	Video descriptions should retain the correct Google Drive and Moodle-related material links.
Google Drive	Stores multilingual training-material packages across distributed free accounts.	Slides, translated PPTX files, transcripts, assignments, quiz banks and supporting files.	Folder naming and topic-code logic must prevent content drift.
EPD-Assist GPT	Provides multilingual academic mentoring, pathway guidance and formative self-evaluation support.	Learner guidance, quiz preparation prompts, additional case tasks and reflective support.	AI outputs remain formative; Moodle and trainer rules govern completion.
QR and hyperlink layer	Allows direct access to public and restricted entry points.	Scannable entry points and link audit trail.	Links must be checked before submission and again before pilot delivery.

1.4 Multilingual Delivery Architecture

The multilingual architecture of D3.2 has two different levels. The first is the formal project-language level: Latvian, Slovak, Czech, English, Portuguese and Turkish. Moodle course texts, PowerPoint materials, transcripts, open-ended assignments and quiz banks are organised so that learners can work through the course in the project languages. The second is the extended access level created by YouTube subtitle functionality. Since English subtitle scripts and transcripts were produced for the training videos,

YouTube can support automatic subtitle generation through Google Translate for a wider language set. This does not replace validated project-language materials. It extends accessibility for dissemination and informal learning.

This distinction should be made explicit in the report. Validated multilingual materials in Moodle and Google Drive are the formal deliverable layer. YouTube auto-translation is an access amplifier. It improves reach, but it should not be treated as the official translation authority for assessment-critical texts. Assessment instructions, quiz questions, assignments and certificate-bearing course information must remain under the controlled project-language layer. The system is stronger when this boundary is named rather than hidden.

The same logic applies to EPD-Assist. Its value lies in multilingual academic mentoring and adaptive support. It can clarify terms, suggest learning paths, generate additional quiz questions, help learners prepare for open-ended assignments and support reflective self-evaluation. It should not be described as an autonomous examiner. D3.2 is an AI-aided learning system, not an AI-dominated credentialing system. This phrasing protects the project from a predictable criticism: that fluent AI output might be confused with validated assessment.

1.5 Topic-Level Learning Flow and Completion Logic

Each Moodle topic follows a controlled progression. The learner first accesses the embedded YouTube video. The learner then reviews the PowerPoint presentation and transcript in the relevant language. These objects form the preparation layer. Only after this layer has been completed does the open-ended assignment become accessible. The assignment requires written or applied engagement with the topic. Once the assignment has been submitted, the quiz opens. This sequence is pedagogically sound because it preserves the movement from concept to method, from method to learner production, and from learner production to scored verification.

The quiz system gives each learner ten questions per attempt. Each question carries ten points. The passing threshold is 60 out of 100. The learner has three attempts to reach the threshold. Questions are drawn randomly at each attempt, and the answer options are also randomised. This design reduces mechanical memorisation, supports fairness across attempts and creates a defensible completion rule. When the learner reaches the threshold, Moodle generates a certificate for that specific topic course. This three-attempt rule applies only to formal Moodle quiz attempts. It should not be confused with the unlimited formative practice that EPD-Assist can generate outside the formal assessment setting. EPD-Assist may support preparation through additional questions, explanations and case prompts, but Moodle remains the only environment where quiz attempts, scores, completion status and certificate triggers are formally recorded.

The certificate should be interpreted carefully. At topic level, it certifies completion of a defined learning unit under a specified activity and quiz rule. It should not be inflated into a full programme qualification. The stronger credential architecture will come from aggregating topic completions into modules, playlists, professional pathways or curriculum-defined programmes. D3.2 should keep this distinction visible: topic completion records are granular evidence; programme-level recognition requires a higher aggregation logic.

Table 1.2. Topic-level progression and completion logic

Step	Learner Action	System Gate	Assessment Function	Evidence
1	Enrol in the Moodle topic course.	Course access enabled.	Entry into the learning object.	Enrolment or access record.
2	Watch the embedded YouTube video.	Video activity completed.	Conceptual exposure and orientation.	Moodle activity status and video availability.
3	Download and review PPTX and transcript.	Preparatory materials completed.	Language-specific study and revision.	Material access/completion record.
4	Complete and upload open-ended assignment.	Quiz becomes available after submission.	Learner production and formative self-evaluation.	Assignment submission and timestamp.
5	Take randomised quiz, 10 questions per attempt.	Three attempts; pass at 60/100.	Scored verification of topic learning.	Quiz score, attempt record and completion status.
6	Receive automated topic certificate.	Certificate generated after successful completion.	Micro-recognition of topic-level achievement.	Certificate record.

1.6 Playlist Logic and Programme-Based Navigation

YouTube playlists are used as a navigation layer, not as a replacement for Moodle. The playlist structure allows learners and external users to approach the training videos through disciplinary and professional routes. Current playlist groups include city and regional planning, landscape architecture, civil engineering, architecture, and vocational education/local government pathways. These lists translate the curriculum architecture into recognisable user-facing routes. A planning student does not need to begin by reading the full 147-topic catalogue; the playlist gives an intelligible entry path while Moodle retains the assessment and completion logic.

The playlist layer also serves dissemination. Public video pathways lower the entry barrier for professionals, municipalities, chambers and learners who first encounter EPD-Net outside Moodle. Once a learner requires certification, assignment submission or quiz-based completion, the pathway must return to Moodle. This division is correct. YouTube is excellent for access and discoverability; Moodle is necessary for learning records, progression rules and certificates.

Table 1.3. Programme-based YouTube playlist routes

Playlist Route	Curricular Emphasis	Primary Users
City and Regional Planning	Urban density, zoning, participatory processes, strategic resilience, GIS and urban form.	Planning students, planners, municipal planning units.
Landscape Architecture	Green infrastructure, ecosystem services, biodiversity, watershed logic and climate-responsive public space.	Landscape architecture learners and practitioners.
Civil Engineering	Infrastructure vulnerability, stormwater management, flood modelling, BIM and emergency shelter infrastructure.	Civil engineering learners, infrastructure specialists.
Architecture	Climate-responsive form, passive strategies, green roofs, digital twins, parametric design and retrofitting.	Architecture students and building-sector professionals.
VET and Local Government	Sustainable city principles, EU policy, finance, participation, climate commitments and operational implementation.	VET learners, municipal staff, implementation actors.

1.7 Distributed Repository Logic and File-Volume Management

The Google Drive repositories contain the file-intensive layer of D3.2. This includes English source PPTX files used for video production, translated PPTX materials in project languages, translated transcript files, open-ended assignment packages and quiz banks. Since each topic may contain several language versions and multiple activity files, the total file count has expanded into thousands. Reproducing these materials in the D3.2 report would be poor reporting practice. It would make the document unreadable and still fail to prove that the system works.

The acceptable evidence model is different. The report should describe the repository architecture, provide access links, document the relationship between topic codes and folders, show representative screenshots or QR access pages, and explain how the repository is connected to Moodle and YouTube descriptions. For each topic, the YouTube description includes links to the relevant Google Drive materials. This creates a practical public route from video to supporting materials while Moodle remains the controlled route for activity progression and certification.

The use of three free Google accounts is defensible if it is documented as a sustainability strategy. The 15 GB storage limit of free Google accounts creates a rational need for distribution. What matters for quality is not whether the repository is split across accounts. What matters is whether the split remains legible: each repository must have a stable role, link, folder logic and update protocol. D3.2 should therefore report the three repositories as a distributed storage architecture rather than as three unrelated drives.

1.8 AI-Supported Mentoring and Self-Evaluation

EPD-Assist GPT is the academic mentoring and self-evaluation companion of the Smart Training Module. Its function is not limited to answering questions. It supports conceptual clarification, multilingual learning orientation, personalised pathway guidance, quiz preparation, methodological scaffolding for assignments and generation of additional formative tasks. With large language model support, it can produce unlimited additional quiz questions, case-study prompts and assignment variants. This is valuable because it allows learners to practise beyond the fixed Moodle quiz bank without exhausting the formal assessment items.

The system should still maintain a hard boundary between formative support and certified completion. EPD-Assist can help a learner understand why an answer is weak, how to structure a case analysis, which topics to review before a quiz, or how to translate a resilience problem into variables and indicators. The Moodle quiz and completion settings certify topic-level achievement. This separation is not bureaucratic caution. It is the condition that makes AI support acceptable inside a public Erasmus+ deliverable.

The Nature-Based Intelligence GPT is positioned as a complementary public decision-support layer within the wider EPD-Net digital ecosystem. It does not replace EPD-Assist GPT and it does not function as a formal D3.2 self-evaluation or certification mechanism. Its specific value lies in supporting nature-based reasoning, ecological planning interpretation, case-based solution exploration and decision-oriented reflection for Nature Cities Alliance-related questions. In this sense, NBI acts as a digital intelligence surface for nature-based analysis, while EPD-Assist remains the official AI-supported academic mentoring and formative self-evaluation layer of D3.2.

1.9 Digital Access Points and QR-Ready Entry Layer

The following access points define the reviewable digital surface of D3.2. These links should be checked before formal submission, then again before pilot delivery. Where access is restricted, credentials should be provided separately to authorised reviewers rather than printed inside the public report. The QR codes at the end of this chapter are intended to support field use, dissemination events and rapid reviewer access.

Table 1.4. Digital access points for D3.2

Component	Link	Access Logic	D3.2 Function
YouTube Playlists	https://www.youtube.com/@EPD-Net/playlists	Public	Playlist entry layer for programme-specific and need-specific video pathways.
YouTube Videos	https://www.youtube.com/@EPD-Net/videos	Public	Channel-level video archive for EPD-Net training lessons.
EPD-Assist GPT	https://chatgpt.com/g/g-69f9df6fd9c48191ab3ccc1bacc8759f-epd-assist	Public / need subscription to the platform	AI-supported academic mentoring, self-evaluation guidance and learning-pathway support.
Google Drive Repository 1	https://drive.google.com/drive/u/1/folders/1g_HuGNRrKOO80pdA3Dihs7o-of8gOJ14	Public	Distributed repository branch for multilingual training materials. Drive1: Epdnet-topics-101-1703
Google Drive Repository 2	https://drive.google.com/drive/folders/1udsp1IfYDwg1aWGLc2dTZYiC9-66rvlB?usp=sharing	Public	Distributed repository branch for multilingual training materials. Drive2: Epdnet-topics-1801-3503
Google Drive Repository 3	https://drive.google.com/drive/folders/1bgDMfxsNk0D30vGlc4bK0nKokYjfm64m?usp=sharing	Public	Distributed repository branch for multilingual training materials. Drive3: Epdnet-topics-3601-6403
Moodle LMS	https://epd-net.eskisehir.edu.tr	Public / need subscription to the platform	LMS delivery environment where topic-level courses, activities, quiz access and certificates are managed.
Nature-Based Intelligence GPT	https://chatgpt.com/g/g-69fb579a2db88191a2cdf00729230c7f-nature-based-intelligence	Public / need subscription to the platform	Complementary decision-support resource. It supports nature-based reasoning, ecological interpretation and case-based solution exploration. It is not part of the formal D3.2 self-evaluation, Moodle progression, assessment or certification chain.

1.10 Chapter Implementation Statement

Chapter 1 establishes the operating claim of D3.2: the Smart Training Module is a distributed, multilingual, topic-coded and assessment-bearing digital learning system. Its quality cannot be judged by counting files or by inspecting a single platform in isolation. It must be judged by the relation between curriculum topic, Moodle course, video object, translated material package, assignment gate, randomised quiz, certificate rule and AI-supported learner guidance.

The implementation logic is lean but credible. YouTube gives scalable access to videos and subtitles. Google Drive stores the full multilingual material base without inflating the report. Moodle controls progression, assessment and certification across 147 topic-level courses. EPD-Assist gives multilingual academic mentoring and adaptive self-evaluation support. QR codes and public links make the system reviewable. This is the correct reporting frame for D3.2. It treats the deliverable as a living web-based application, not as a printed archive of thousands of files.

1.11 QR Code Access Sheet

The QR codes below provide direct access to the key digital entry points. They are included for operational access and should be replaced only if the underlying platform URLs change.

QR Access Points for YouTube Playlists, YouTube Videos, EPD-Assist GPT, Google Drive Repository 1, Google Drive Repository 2, Google Drive Repository 3, Moodle LMS, Nature-Based Intelligence GPT are provided in Appendix 1.

Chapter 2. Digital Learning Architecture and Access Infrastructure

2.1 Architecture Principle: Distributed but Controlled

The digital architecture of D3.2 is deliberately distributed. Moodle, YouTube, Google Drive and EPD-Assist GPT do not perform the same task and should not be forced into a single platform logic. Moodle is the controlled learning environment. YouTube is the video access and dissemination layer. Google Drive is the scalable material repository. EPD-Assist GPT is the multilingual academic mentoring and self-evaluation layer. The project web page and QR links function as entry points. This separation is not fragmentation. It is a practical architecture for a multilingual, file-heavy and post-project sustainable training module.

A centralised platform would have looked cleaner in a diagram, but it would have been less robust in practice. The Smart Training Module now contains a large volume of derived educational objects: video materials, English subtitle scripts, translated PowerPoint files, translated transcripts, open-ended assignments and quiz banks across project languages. Concentrating this material inside a single report or a single closed repository would make the deliverable brittle. The chosen structure keeps public learning access open, keeps formal completion inside Moodle, keeps heavy files in dedicated repositories and keeps adaptive guidance in EPD-Assist.

The architecture therefore has one governing rule: every external platform must remain tied to the curriculum topic identity. The system can be distributed only because the topic code, course shell, video object, material folder, assignment package, quiz bank and certificate rule are held together. Without that alignment, distribution would become disorder. With it, D3.2 becomes a controlled digital learning ecosystem rather than a list of links.

2.2 Functional Layers of the D3.2 System

The D3.2 infrastructure is best understood as five functional layers. Each layer has a limited mandate. The quality of the system depends on respecting those limits. YouTube should not be treated as the assessment platform. Google Drive should not be treated as the learner progression system. EPD-Assist should not be treated as the final certifier. Moodle should not be overloaded with the storage burden of every derivative file if a repository structure can handle it more sustainably.

Table 2.1. Functional layers of the D3.2 digital learning architecture

Layer	Primary function	What it controls	What it does not control	Evidence to retain
Moodle LMS	Formal course delivery and completion management.	Topic enrolment, activity order, assignment submission, quiz access, pass status and certificate generation.	Public dissemination or bulk storage of all derivative material.	Course shell, activity settings, quiz configuration, completion rule and certificate sample.
YouTube	Open video access and playlist-based discovery.	Training video visibility, programme playlists, automatic subtitle availability and video-description links.	Learner certification, assignment submission or quiz scoring.	Channel link, playlist list, video examples and description-link logic.
Google Drive repositories	Storage and distribution of multilingual learning files.	PPTX files, transcripts, assignments, quiz banks and language-specific material folders.	Learning progression, scoring or certification.	Repository links, folder logic, representative material packages and version notes.
EPD-Assist GPT	Academic mentoring and AI-supported self-evaluation.	Concept clarification, pathway advice, formative prompts, quiz practice and assignment scaffolding.	Formal grading or final competence certification.	GPT link, user guidance text and examples of permitted support functions.
Project web page and QR layer	Orientation and rapid access.	Public entry, dissemination access, reviewer navigation and link consolidation.	Curriculum governance or assessment validation.	QR pages, access table and public web reference.

Nature-Based Intelligence GPT is treated as a complementary decision-support layer connected to the broader EPD-Net learning ecosystem. Unlike EPD-Assist GPT, it is not the formal AI-supported self-evaluation system of D3.2. Its role is to support nature-based interpretation, ecological solution exploration and decision-oriented reasoning, particularly where learners or external users engage with Nature Cities Alliance themes, nature-based solutions, green-blue infrastructure, ecosystem-based adaptation or urban resilience scenarios. NBI therefore extends the public intelligence surface of the project without changing the formal completion logic governed by Moodle.

2.3 Access Infrastructure and Entry Points

The access infrastructure serves different users without forcing them into the same route. A casual external learner may begin with the YouTube channel. A registered participant begins with Moodle. A trainer may enter through the repository to check the material package. A learner who needs academic

orientation may begin with EPD-Assist. A reviewer may use QR codes to inspect the public surface quickly before checking Moodle evidence. The architecture is therefore multi-entry, but it is not multi-standard. The learning standard remains anchored in the topic-level Moodle course and its completion rules.

The visible access points are the EPD-Net YouTube channel, the playlists page, the Moodle platform at epd-net.eskisehir.edu.tr, EPD-Assist GPT, the three Google Drive repositories and the project website. The three Google Drive repositories should be reported transparently as a distributed storage solution caused by free-account capacity limits. This is acceptable if the folder structure, naming discipline and update protocol remain stable. The project should not hide this design choice. It should explain it as a sustainability strategy designed to keep materials available after the funded period without imposing recurring licence costs on partners or learners.

Access control must be handled with precision. Public links can be printed in the report and converted into QR codes. Restricted Moodle credentials should not be printed in a public deliverable. Where reviewer access is required, credentials should be provided separately to authorised persons. The report should record that access is available, not expose accounts or passwords. This protects the system without weakening verifiability.

Table 2.2. Access routes and control conditions

Entry point	User route	Correct use	Control issue
YouTube playlists	Programme or need-based video discovery.	Public orientation and disciplinary pathway browsing.	Should redirect users to Moodle for completion and certification.
YouTube videos	Topic-level video access.	First exposure to the lesson and automatic subtitle support.	Video viewing alone is not course completion.
Google Drive repositories	Material download through video descriptions or trainer guidance.	Access to PPTX, transcript, assignment and quiz-related files.	Folder naming and link stability must be maintained.
Moodle LMS	Registered topic-level learning.	Formal sequence, assignment submission, quiz attempt and certificate generation.	Credentials and learner data must remain controlled.
EPD-Assist GPT	Academic mentoring and self-evaluation support.	Concept clarification, pathway advice and formative assessment preparation.	AI output remains formative and trainer/Moodle rules govern certification.

2.4 From Content Production to Learner Access

The content pathway begins with English source materials. PowerPoint presentations prepared in English are used to produce lesson videos. English subtitle scripts and transcripts are generated from these video materials. The transcript layer then supports translation into project languages and enables YouTube automatic captioning for a wider set of languages supported by Google Translate. This is not a minor accessibility feature. It is the mechanism through which one source lesson can become a multilingual learning object without requiring the project to manually produce every possible language version.

For the formal project languages, Moodle and the Google Drive repositories hold translated PPTX files, translated transcripts, open-ended assignment packages and quiz materials. This gives the learner a coherent material set in their own language while preserving the English source layer as the technical and semantic reference. The architecture is efficient because it separates source production from language distribution. It is also risky if translation control is weak. Topic codes, file names and learning-object titles must therefore remain stable across languages.

The YouTube description field is an important bridge. It connects the public video to the material repository. A learner watching a topic video can reach the supporting materials through the linked Google Drive folders. Moodle then provides the formal learning sequence, where access to assignments and quizzes is governed by completion rules. This division gives the project both openness and control: open access to learning resources, controlled access to assessment evidence.

Table 2.3. Content production and learner access chain

Production stage	Digital object	Platform location	Learner value	Quality control
Authoring	English PPTX and lesson structure.	Repository and production archive.	Defines the source knowledge object.	Topic code and title must match curriculum.
Video production	English video and subtitle script.	YouTube channel and production archive.	Provides core audiovisual lesson.	Transcript must correspond to final video.
Translation	Translated PPTX, transcript, assignment and quiz materials.	Google Drive repositories and Moodle.	Supports project-language learning.	Terminology and topic identity must be preserved.
Public access	Video, playlist and description links.	YouTube.	Enables discovery and self-paced orientation.	Links must point to the correct material folder.
Formal learning	Course activity sequence, assignment, quiz and certificate.	Moodle LMS.	Produces trackable completion evidence.	Activity gates and pass rules must be configured.

2.5 Repository Logic and File-Volume Governance

The material repositories should be treated as controlled supporting infrastructure, not as an annex to be reproduced. The current file volume is a consequence of the system design: each topic can generate a video, a source presentation, multilingual presentation files, multilingual transcripts, open-ended assignments and quiz items. Across 147 topics, this necessarily produces several thousand files. Attempting to print or embed them in D3.2 would reduce clarity and would not improve auditability.

A stronger reporting method is to document the repository logic. The D3.2 report should identify the repositories, explain the folder principles, show how topic-level materials are linked from YouTube descriptions and Moodle courses, and provide representative evidence. This is how a web-based application deliverable should be inspected. Reviewers need to know that the materials exist, are reachable, are connected to the curriculum and can be used in the learning sequence. They do not need thousands of pages of duplicated file lists.

The three-repository design has to remain legible. Each Drive branch should be named, linked and, where possible, associated with a material scope or capacity function. If files are moved, the link map must be updated. If language versions are revised, the date or version must be traceable. If a video description links to a folder, the folder should not be reorganised casually. In a distributed system, link stability is a quality condition.

2.6 Moodle as the Controlled Learning Environment

Moodle is the only layer that should be treated as the formal learning environment for completion. The platform contains 147 separate topic-level courses, each organised with multilingual options. The topic course begins with the embedded YouTube video. It then requires the learner to access the supporting material package, including the PowerPoint and transcript. The open-ended assignment follows. The quiz becomes available only after the assignment has been submitted. This sequence matters because it prevents quiz access from being detached from the learning process.

The Moodle design turns D3.2 from a resource platform into an evidence-bearing training module. Enrolment, activity completion, assignment upload, quiz attempts, scores and certificates become retrievable records. These records are not merely administrative traces. They show that the learning object was entered, that required steps were followed, that an assessment gate was reached, and that the pass rule was applied. For AB reporting, this is more valuable than a large file archive.

The system's quiz logic should be reported as part of the access architecture but detailed in the assessment chapter. At this point, the key point is structural: the quiz is not floating outside the course. It is locked behind the learning sequence and assignment submission. The certificate is generated after successful topic completion. This makes the topic course a micro-unit of verifiable learning.

2.7 EPD-Assist as a Multilingual Mentoring Layer

EPD-Assist GPT gives D3.2 an adaptive function that static repositories cannot provide. It can explain concepts, clarify terminology, propose learning pathways, help learners prepare for quizzes, support open-ended assignments and generate additional formative questions or case-study prompts. Its value increases precisely because the Moodle system is granular. A learner can ask for guidance on a topic, a module, a disciplinary pathway or a professional problem; EPD-Assist can orient the learner without replacing the formal course structure.

The correct boundary must be explicit. EPD-Assist is an academic mentor and self-evaluation support system, not an autonomous examiner. It can generate practice questions, diagnose gaps, propose revision strategies and scaffold case reasoning. The Moodle quiz, assignment submission and certificate rules remain the formal completion mechanism. This division protects the deliverable from an obvious criticism: that AI-generated feedback may be fluent but not institutionally accountable.

The multilingual function of EPD-Assist also strengthens access. Learners who struggle with English-only materials can use the GPT layer for explanation and orientation. This does not remove the need for translated PPTX and transcripts; it complements them. Translated materials provide controlled content. EPD-Assist provides adaptive interaction around that content.

2.8 Acceptance Evidence and Maintenance Controls

For D3.2, acceptance evidence should be compact and demonstrable. The report should provide access links, QR codes, platform screenshots, representative Moodle course pages, examples of activity gating, a sample certificate, representative Drive folders and playlist evidence. The evidence should show the system operating, not merely describe it. A reviewer should be able to trace one topic from curriculum identity to YouTube video, from video to material folder, from material folder to Moodle activity, from assignment to quiz, and from quiz success to certificate.

Maintenance controls must be equally simple. Link checks should be performed before submission and before each pilot use. Moodle course settings should be reviewed after bulk edits. Google Drive folder moves should be avoided unless the link map is updated. YouTube descriptions should be treated as operational metadata, not as informal text. EPD-Assist guidance should be updated when curriculum or platform links change. These controls do not need a heavy bureaucracy. They need discipline.

Table 2.4. Minimum infrastructure controls for D3.2 acceptance

Control point	Minimum check	Responsible function	Record
Link integrity	YouTube, Drive, Moodle, EPD-Assist and QR links open as intended.	Platform or content manager.	Link-check log or dated checklist.
Topic consistency	Topic code, title, video, folder and Moodle course correspond.	Curriculum and LMS manager.	Sample traceability record.
Language availability	Project-language files exist where promised.	Content manager and partner reviewers.	Folder screenshot or material index.
Moodle gates	Video/material steps, assignment and quiz availability follow the defined sequence.	LMS administrator.	Course-setting screenshot.
AI boundary	EPD-Assist guidance remains formative and does not certify competence.	EPD-Assist content owner and trainer.	User guidance note.

2.9 Chapter Conclusion

Chapter 2 defines D3.2 as a distributed but controlled digital learning architecture. The system is credible because each platform has a bounded role: YouTube gives access and dissemination, Google Drive holds the multilingual material volume, Moodle manages formal progression and certification, EPD-Assist provides multilingual academic mentoring and formative self-evaluation, and QR/hyperlink layers make the system inspectable. None of these layers is sufficient alone. Together, they form the operational infrastructure of the Smart Training Module.

The critical standard is traceability. The 147 topic-level courses, thousands of material files and multiple digital platforms are acceptable only if they remain tied to stable topic identities and learning rules. The report should not apologise for the use of external platforms. It should make the logic visible: free, durable and widely accessible platforms are used where they are strongest; Moodle is retained where formal learning control is required; EPD-Assist supplies the adaptive mentoring layer. That is the defensible architecture for a multilingual Erasmus+ training module intended to survive beyond the project period.

Chapter 3. Moodle Course Structure and Learner Progression Rules

3.1 Moodle as the Controlled Delivery Layer

Moodle is the controlled delivery layer of the EPD-Net Smart Training Module. YouTube hosts the video layer, Google Drive stores the multilingual material repositories, and EPD-Assist GPT supports academic mentoring and formative self-evaluation. Moodle is the place where these assets become an ordered learning process. Its function is not to duplicate the repository. It controls access, sequence, learner action, evidence generation and completion.

The implementation is organised as 147 topic-level courses. This decision is operationally stronger than placing all content inside a few oversized course shells. A topic-level course gives each learning object a precise location, allows assessment and completion rules to be attached to the relevant unit, and makes certification possible without confusing one topic with another. The unit of delivery is therefore small enough to be auditable, but stable enough to remain connected to the broader curriculum architecture.

The Moodle structure should be read as an evidence system. A learner does not simply watch a video and receive recognition. The platform obliges a progression from video access to material review, from transcript download to open-ended assignment, from assignment submission to quiz access, from quiz success to certificate generation. This sequence protects the pedagogical logic of D3.2: concept, method, application, self-evaluation and verifiable completion.

3.2 Course Shell Standard for 147 Topic-Level Courses

Each Moodle course shell should follow the same minimum internal grammar. Standardisation is not aesthetic neatness. It is the condition for managing a large multilingual training system without losing traceability. If one topic hides its transcript under a different label, if another separates the assignment from the video, if a third uses a different completion rule, the system becomes fragile. Consistent course shells allow learners, trainers and reviewers to understand the module without inspecting thousands of files manually.

The course shell begins with a short topic statement and the embedded YouTube video. The video is followed by the PowerPoint presentation, the transcript and the supporting material links. The open-ended assignment is placed after these required learning objects. The quiz is placed after the assignment gate. The certificate is linked to successful quiz completion. This structure is deliberately conservative. It avoids unnecessary platform complexity and makes the learning evidence defensible.

Table 3.1. Standard Moodle course shell for each topic

Course object	Function	Control requirement
Topic orientation	States the topic title, topic code, learning focus and place within the Smart Training Module.	The topic code and title should remain identical to the curriculum and repository metadata.
Embedded YouTube video	Provides the primary lecture video through the EPD-Net YouTube channel.	The video must be embedded or linked before the learner proceeds to supporting materials.
PowerPoint presentation	Gives the structured visual lecture material used for video production and learner review.	Project-language versions should be available where prepared.
Transcript	Provides the written lecture script and supports accessibility, multilingual review and evidence-based progression.	The transcript must be downloaded or marked complete before assignment access.
Open-ended assignment	Requires the learner to produce applied reflection, case response or task-based evidence.	Quiz access should remain closed until the assignment has been submitted.
Quiz	Tests conceptual and applied understanding through randomly selected questions.	The configured rule is ten questions, ten points each, with a 60/100 pass threshold and three attempts.
Certificate	Provides topic-level recognition after successful completion.	The certificate should be generated automatically only after the passing condition is met.

3.3 Multilingual Material Placement

The multilingual design of D3.2 is handled through a pragmatic division of labour. English source PPTX files and English transcripts constitute the production base. The LMS then provides translated PPTX files, translated transcripts, open-ended assignments and quiz questions in the project languages. YouTube extends the language layer through automatically generated subtitles based on the English scripts and transcript infrastructure. This does not remove the need for controlled project-language materials in Moodle. It gives the system an additional access route for users beyond the formal project languages.

The critical point is semantic stability. The same topic must remain recognisable across language versions. Translation may change syntax and examples, but it should not change the competence claim. A learner entering the Portuguese version, a Turkish version or an English version must encounter the same course identity, the same learning sequence and the same completion logic. Multilingual access is valuable only when it does not fragment the curriculum.

Table 3.2. Multilingual course objects and their function

Object	Language logic	Use in Moodle
Video	English lecture video supported by YouTube subtitle and auto-translation functions.	Embedded as the opening learning object for each topic.
PPTX	Prepared in English and translated into the project languages where available.	Used as structured lecture support and review material.
Transcript	English source transcript and translated versions in project languages.	Required before access to the open-ended assignment.
Open-ended assignment	Prepared as self-evaluation and applied learning evidence in project languages.	Submitted before quiz access is enabled.
Quiz pool	Topic-level questions available in project languages.	Randomised question delivery supports repeated but controlled assessment.
Certificate text	Generated through the course completion rule.	Should preserve learner name, topic title and completion status.

3.4 Conditional Progression Rule

The Moodle progression rule gives D3.2 its instructional discipline. Learners should not move directly from enrolment to quiz completion. The course sequence requires engagement with the video, the presentation and the transcript before the open-ended assignment becomes available. The assignment then acts as a gate before the quiz. This is a sound design choice. It prevents the quiz from becoming an isolated test and forces the learner to pass through content exposure, written review and applied response before attempting formal completion.

The rule is not designed to create bureaucratic friction. It protects learning quality. A transcript download requirement may appear minor, but it creates a minimum evidence point for material access and gives the learner a text-based reference before producing the open-ended assignment. The assignment gate then separates passive viewing from active self-evaluation. The quiz becomes the final diagnostic check, not the whole learning experience.

Table 3.3. Learner progression and evidence points

Step	Learner action	Moodle control	Evidence produced
1	Enrol in the topic-level course.	Course enrolment opens the topic shell.	Enrolment or access record.
2	Watch the embedded YouTube video.	Video is placed as the initial learning object.	Activity access and completion indication where enabled.
3	Review the PPTX and download the transcript.	Transcript completion is required before assignment access.	Download or completion record.
4	Complete and upload the open-ended assignment.	Quiz remains locked until submission is completed.	Submitted file or text response.
5	Take the quiz.	Ten random questions are presented from the topic pool.	Quiz attempt record and score.
6	Reach the passing condition.	Score must be at least 60/100 within the allowed attempts.	Completion status.
7	Receive the topic certificate.	Certificate is generated automatically after successful completion.	Certificate record.

3.5 Open-Ended Assignment as the Self-Evaluation Gate

The open-ended assignment is the weakest point if it is treated as a formality; it is one of the strongest points if used correctly. Every topic contains three open-ended assignment options for self-evaluation and applied reasoning. These tasks should ask learners to explain, diagnose, compare, design or justify. They should not merely ask for summary. In a training module on ecological planning and disaster resilience, the learner must show some capacity to connect concepts to spatial, environmental, social or technical consequences.

The assignment gate also gives EPD-Assist GPT a legitimate role. The learner may use EPD-Assist for clarification, methodological guidance, case-study framing, indicator selection, rubric logic and revision strategy. That use is academically defensible because the assignment remains learner-produced and submitted in Moodle. EPD-Assist supports the reasoning process; Moodle records the learner's artefact. This separation should be protected. AI support must not erase learner authorship or trainer oversight.

3.6 Quiz Configuration and Completion Rule

The quiz rule is compact and auditable. Each quiz attempt presents ten questions. Each question carries ten points. The pass threshold is 60/100. The candidate has three attempts to meet the success criterion. Question selection is randomised at each opening of the quiz, and answer options are also randomised. This configuration reduces memorisation, supports fairness across repeated attempts and gives the learner a controlled route to mastery without allowing unlimited uncontrolled repetition.

For this reason, the following standard learner-facing text should be inserted into the information section of every Moodle topic course: "Formal quiz rule: Each topic quiz consists of 10 randomly selected questions. Each question is worth 10 points. The pass threshold is 60/100. Each learner has three formal Moodle attempts. Questions and answer options are randomised at each attempt. Additional practice

questions generated through EPD-Assist are formative learning support only and do not count as formal quiz attempts or certification evidence."

The quiz should be understood as a completion assessment, not as the only proof of competence. In the Moodle sequence, the quiz comes after video review, transcript access and open-ended assignment submission. Its role is to verify that the learner has reached a minimum threshold of conceptual and applied understanding. Higher-order judgement, complex design reasoning and professional critique remain better evidenced through assignments, case tasks and trainer-mediated feedback. D3.2 should be precise on this point. Automatic scoring is efficient; it is not equivalent to full academic judgement.

Table 3.4. Quiz and certification configuration

Element	Configured rule	Quality implication
Question number	Ten questions per attempt.	Keeps the assessment short enough for topic-level completion.
Scoring	Each question is worth ten points, total score 100.	Makes the pass rule transparent to learners and reviewers.
Pass threshold	Minimum 60/100.	Defines a clear completion standard.
Attempts	Three attempts.	Allows correction while avoiding uncontrolled repetition.
Randomisation	Questions and answer options are randomised in each attempt.	Reduces answer copying and memorisation.
Certificate	Generated after successful completion.	Turns topic-level achievement into a retrievable learner record.

The attempt limit applies to the formal Moodle quiz. Formative practice generated by EPD-Assist is outside the formal attempt count and should never be described as an additional Moodle attempt.

3.7 Certificate Generation and Learning Evidence

Automatic certificate generation is a useful function only when the conditions behind it are clear. The certificate should indicate that the learner completed the specified topic-level course under the configured Moodle rule. It should not imply that the learner has completed the entire EPD-Net curriculum unless a separate programme-level certificate is created. This distinction protects the credibility of the system. Topic completion, playlist completion and programme completion are not the same evidence object.

For project reporting, Moodle evidence should remain lean and retrievable. The minimum evidence set includes course enrolment or access data, material completion records where enabled, assignment submissions, quiz attempt data, pass status and certificate generation. The report does not need to contain these records for every learner. It needs to demonstrate that the platform is configured to produce them. This is the correct evidence logic for a web-based application deliverable.

3.8 Moodle Delivery Risks and Controls

The first risk is course-shell drift. With 147 topic-level courses, small inconsistencies become structural. A missing transcript, a misplaced assignment, an unlocked quiz or a certificate linked to the wrong completion rule can undermine the evidence chain. The control is a standard shell checklist before public or pilot delivery.

The second risk is language fragmentation. If translated materials differ in title, sequence or task requirement, the same topic begins to function as multiple courses. The control is metadata stability:

identical topic codes, stable file naming, aligned course titles and a controlled language structure across Moodle and Google Drive.

The third risk is confusing platform activity with learning quality. Moodle can show access and quiz success, but it cannot by itself interpret the depth of ecological planning judgement. The control is to keep the assignment gate, EPD-Assist mentoring and trainer review available for tasks that exceed recognition-level learning.

Table 3.5. Moodle implementation risks and control measures

Risk	Failure mode	Control
Course-shell drift	Different topics use different sequences, labels or completion conditions.	Use a standard Moodle shell and pre-delivery checklist.
Broken link chain	YouTube, Google Drive or Moodle links no longer connect to the correct topic.	Check links by topic code and maintain repository records.
Language inconsistency	Translated materials alter the competence claim or assessment expectation.	Keep topic codes, titles and core instructions stable across languages.
Assessment inflation	A quiz score is treated as proof of advanced professional competence.	Use quizzes for threshold completion and assignments for applied evidence.
Certificate ambiguity	Topic-level certificates are misread as full programme certificates.	State the certificate scope in the Moodle certificate template.

3.9 Chapter Implementation Statement

Chapter 3 defines Moodle as the evidence-bearing delivery layer of D3.2. Its importance lies in the sequence it imposes: enrolment, video, PPTX, transcript, open-ended assignment, quiz, pass threshold and certificate. This sequence makes the Smart Training Module more than a public video channel and more than a file repository. It becomes a controlled learning environment.

For D3.2 acceptance, the key claim is not that every material file is printed inside the report. That would be an error. The key claim is that the platform gives each topic a stable learning shell, a multilingual material route, an assignment gate, a randomised quiz mechanism and a certificate record. If this structure is maintained across the 147 topic-level courses, Moodle provides the auditable backbone of the Smart Training Module.

Chapter 4. EPD-Assist GPT and AI-Based Self-Evaluation System

4.1 Function of EPD-Assist within D3.2

EPD-Assist GPT is the academic mentoring and self-evaluation layer of D3.2. It does not replace Moodle, YouTube or the Google Drive repositories. Its function is different: it interprets the curriculum for the learner, helps the learner navigate the 147 topic-level course environments, supports conceptual clarification, generates formative practice, and connects the learner back to Moodle when a formal course action must be completed. The system is therefore not an external chatbot attached to the module. It is a guided interface between curriculum complexity and learner action.

This distinction is important. The Smart Training Module contains a large curriculum, multilingual materials, programme-specific playlists, assignments, quiz banks and repository links. A learner can access these assets, but access alone does not guarantee orientation. EPD-Assist reduces that orientation gap. It can explain a term, recommend a learning pathway for a target such as GIS, nature-based solutions, disaster risk reduction or climate policy, help the learner understand an assignment brief, and prepare the learner for the Moodle quiz without giving the quiz itself away as a mechanical answer key.

The correct reporting claim is narrow and strong. EPD-Assist is an AI-supported formative guidance system. It supports self-evaluation, academic mentoring, resource navigation and methodological scaffolding. It should not be described as a fully automated examiner. Formal completion remains inside Moodle through assignment submission, quiz performance and certificate generation. Higher-order academic judgement remains trainer-mediated where the task requires synthesis, design reasoning, vulnerability diagnosis or professional interpretation.

4.2 Supported Learning Functions

The EPD-Assist layer is designed around six learning functions. Each function has a pedagogical purpose and a boundary. This boundary must stay visible in D3.2, because the value of AI support depends on controlled use. A system that explains, guides and tests formatively strengthens the module. A system that invents outcomes, certifies competence or substitutes for learner authorship would weaken it.

Table 4.1. EPD-Assist learning functions and operating boundaries

Function	Pedagogical use	Boundary
Conceptual clarification	Explains key terms, frameworks and relationships in ecological planning, disaster resilience, GIS, remote sensing, nature-based solutions, policy and design.	It should clarify validated curriculum concepts, not create parallel terminology that conflicts with the module.
Learning pathway recommendation	Suggests which Moodle courses or topic clusters learners should take according to their objective, discipline or competence gap.	The recommendation should point back to Moodle courses and validated topic structures.
Assignment support	Helps learners frame open-ended assignments by discussing data needs, variables, scale, scenario logic, evaluation criteria and rubric reasoning.	It may guide method and structure; the submitted answer must remain the learner's own work.
Quiz preparation	Produces revision plans, sample question types, error explanations and concept checks before the formal Moodle quiz.	It should not be treated as a substitute for the randomised Moodle quiz or as a certificate mechanism.
Research and writing support	Supports problem definition, hypothesis formation, methodological design, indicator sets and discussion structure.	It cannot validate research quality without human academic review.
Multilingual access support	Allows learners to ask questions and receive support in different languages while using the same curriculum backbone.	Translation should preserve the topic identity, learning outcome and evidence requirement.

4.3 Self-Evaluation Logic

The self-evaluation model is built before, during and after the formal Moodle assessment. Before a learner enters a topic, EPD-Assist can diagnose orientation: what the learner already knows, which prerequisite topic may be useful, and which course pathway fits the learner's purpose. During the topic, it can help the learner interpret the video, transcript and PPTX. After the open-ended assignment is drafted, it can support revision by asking whether the answer contains a problem statement, method, evidence, spatial or ecological reasoning, and a defensible conclusion.

This is not a cosmetic support layer. It converts self-evaluation from a simple score check into a reasoning process. A learner studying climate-risk mapping should not only ask whether an answer is correct. The learner should ask whether the selected data are appropriate, whether the vulnerability logic is defensible, whether uncertainty is acknowledged, and whether the planning implication follows from the evidence. EPD-Assist can structure these questions. Moodle then records the learner's submitted assignment and quiz performance.

Table 4.2. Self-evaluation sequence across EPD-Assist and Moodle

Stage	EPD-Assist role	Moodle role	Evidence status
Orientation	Helps the learner identify relevant topics, concepts and learning pathway options.	Hosts the selected topic-level course.	Preparatory guidance, not formal completion evidence.
Content comprehension	Explains video, PPTX and transcript content in learner-accessible language.	Provides the video, PPTX, transcript and progression rules.	Learning support before submission.
Assignment drafting	Suggests structure, variables, evidence logic, scenario framing and rubric considerations.	Receives the open-ended assignment submission.	Learner artefact becomes formal evidence in Moodle.
Formative checking	Generates diagnostic prompts and identifies conceptual gaps before the quiz.	Locks or opens the quiz according to completion conditions.	Preparation for formal quiz attempt.
Formal quiz	May support revision after an unsuccessful attempt through concept review.	Randomises questions and options, records score and attempt history.	Formal completion evidence.
Certificate completion	Can explain what completion means and suggest next topics.	Generates the topic-level certificate after the pass condition is met.	Certified topic-level achievement.

4.4 Generative Capacity for Quizzes, Case Studies and Assignments

One of the strongest features of the EPD-Assist layer is its ability to generate additional formative learning material. It can produce unlimited practice quiz questions, case-study prompts, open-ended assignment variants and scenario-based exercises with large language model support. This capacity should be reported carefully. It is a strength only when it is linked to the curriculum taxonomy. Random AI-generated questions are not a training system. Topic-coded, level-calibrated and outcome-aligned practice material is.

The reporting language should therefore avoid exaggeration. EPD-Assist can generate practice and mentoring content at scale. The validated Moodle quiz banks and assignment objects remain the formal assessment layer. This division gives the consortium both flexibility and control. Learners can receive abundant practice without forcing the project team to manually author every possible revision question. The official completion logic remains stable because certificate generation depends on Moodle rules, not on an unrecorded GPT conversation.

Case-study generation is especially valuable for disaster-resilience education. A trainer or learner can ask EPD-Assist to create a scenario on urban heat, flood exposure, vulnerable groups, green infrastructure, GIS-based risk mapping, emergency shelter design or policy implementation. The system can vary scale, target group and evidence type. The intellectual standard must remain clear: generated cases are learning prompts. If used for formal assessment, they should be reviewed or approved by a trainer before being treated as valid evidence.

4.5 Multilingual Academic Mentoring

EPD-Assist extends the multilingual logic of D3.2 beyond static translation. Moodle contains translated PPTX files, transcripts, assignments and quiz questions in the project languages. YouTube supports subtitle translation based on the English script and transcript layer. EPD-Assist adds interactive multilingual mentoring. A learner can ask for clarification, pathway advice, assignment support or quiz preparation in a language that may be more accessible than the original production language.

This is not merely a convenience. Multilingual learning often fails at the moment of interpretation, not at the moment of file access. A translated transcript can deliver content, but it cannot respond to the learner's confusion. EPD-Assist can. The risk is semantic drift. If a term such as resilience, vulnerability, exposure, adaptive capacity, ecosystem service, green infrastructure or human-in-the-loop assessment is explained differently across languages, the same topic may fracture into different competence claims. The system should therefore be constrained by stable topic identifiers, validated curriculum terminology and the English master curriculum where necessary.

Table 4.3. Multilingual support and semantic controls

Support layer	Contribution	Control condition
Moodle language materials	Provides PPTX, transcript, assignments and quiz questions in project languages.	Course title, topic code and completion rule must stay stable.
YouTube subtitles	Expands access through captions and auto-translation based on English scripts.	Subtitles support access but do not replace controlled Moodle materials.
EPD-Assist mentoring	Offers interactive explanation, pathway advice and formative self-evaluation in multiple languages.	Responses should preserve validated terminology and return learners to Moodle for formal completion.
English master scripts	Provide the reference layer for subtitle generation, translation review and terminology control.	They should remain available for audit and revision.

4.6 Human-in-the-Loop Assessment Control

The D3.2 AI layer must be framed through human-in-the-loop control. EPD-Assist can support conceptual learning, formative feedback, assignment planning and quiz preparation. It cannot become the final authority for complex professional judgement. Ecological planning and design involve uncertainty, contested values, social vulnerability, spatial consequences and institutional feasibility. These are not reducible to fluent generated text.

The boundary is straightforward. EPD-Assist can help a learner see whether an assignment addresses the question, whether the reasoning sequence is weak, whether a case-study answer lacks evidence, or whether a GIS-based scenario needs clearer variables. Moodle records formal assignment submission and quiz success. Trainers or authorised reviewers remain responsible for advanced evaluation where the task claims higher-order competence. This keeps the AI component useful without allowing it to inflate the credibility of unverified outputs.

This boundary also protects learner fairness. A learner with stronger prompting skills should not receive an unfair advantage over a learner with stronger disciplinary understanding. The assessment design must

reward evidence, reasoning and submitted work, not merely the ability to produce polished AI-assisted text. For that reason, assignments should ask for contextual judgement, applied reasoning, data logic and explicit connection to course materials. These are harder to outsource and easier to evaluate.

4.7 Integration with 147 Topic-Level Courses

The EPD-Assist layer becomes credible only when it is anchored in the 147 topic-level course structure. Its answers should be able to refer to topic families, course pathways, playlist groupings and Moodle sequence rules. A learner asking for a route into landscape-based flood mitigation should be directed toward relevant topics and then to Moodle. A learner asking for help with an assignment should be guided through evidence and method, then reminded that submission happens in the relevant topic course. A learner preparing for a quiz should receive practice and explanation, not an attempt to bypass the Moodle rule.

This topic-level integration gives D3.2 a defensible scale. The system is large, but not chaotic. The curriculum supplies codes and pathways; YouTube supplies lecture access; Google Drive supplies files; Moodle supplies sequence and certification; EPD-Assist supplies orientation and formative mentoring. If these layers are maintained through stable identifiers, EPD-Assist can support the whole module without becoming a separate, ungoverned learning environment.

4.8 Risk Controls for AI-Supported Self-Evaluation

AI-supported self-evaluation has predictable risks. The first is hallucination: EPD-Assist may produce an unsupported statement if the prompt is vague or the validated material is not referenced. The second is over-certification: learners may treat a positive AI response as proof of competence. The third is authorship erosion: learners may submit text that they did not sufficiently understand or produce. The fourth is multilingual drift: translated explanations may weaken or alter technical meaning. These risks do not invalidate EPD-Assist. They define the controls needed around it.

Table 4.4. AI risks and control measures

Risk	Possible failure	Required control
Hallucinated explanation	The system gives a plausible answer that is not anchored in the curriculum or material repository.	Direct users back to validated Moodle materials, topic codes and trainer review for uncertain claims.
Over-certification	Learners assume that AI approval equals course completion or formal competence.	State that certificates are generated only through Moodle completion rules.
Authorship erosion	Learners submit AI-produced text without sufficient personal reasoning.	Use assignment prompts that require context, evidence, interpretation and learner-specific judgement.
Multilingual drift	Key terms change meaning across languages.	Preserve topic codes, use controlled terminology and keep English scripts as reference.
Weak prompt dependency	The quality of support depends too strongly on learner prompting ability.	Provide starter prompts and trainer-approved use guidance in Moodle.

4.9 Complementary Boundary with Nature-Based Intelligence GPT

Nature-Based Intelligence GPT complements EPD-Assist GPT but does not duplicate its function. EPD-Assist is the official AI-supported mentoring and self-evaluation layer of D3.2, directly connected to topic navigation, assignment scaffolding, quiz preparation and Moodle-based learning progression. Nature-Based Intelligence GPT has a different role: it supports nature-based decision reasoning, ecological interpretation and solution exploration for cases linked to urban resilience, nature-based solutions and Nature Cities Alliance priorities.

This distinction should remain explicit in learner and trainer guidance. A learner may use NBI to explore how a nature-based intervention could respond to flooding, heat stress, ecosystem fragmentation or vulnerable-group exposure. However, formal topic completion, assignment submission, quiz attempts and certificate generation remain inside Moodle. NBI is therefore a complementary reasoning and decision-support surface, not a certification system, not an examiner and not a substitute for EPD-Assist.

4.10 Chapter Implementation Statement

Chapter 4 defines EPD-Assist GPT as the AI-supported academic mentoring and self-evaluation layer of D3.2. Its value lies in orientation, multilingual clarification, pathway recommendation, formative quiz practice, case-study support, assignment scaffolding and research guidance. It gives learners a way to move through a large training ecosystem without reducing the system to a static repository.

For acceptance, the core point is exact. EPD-Assist should be presented as a controlled support mechanism linked to Moodle, topic codes, validated materials and human judgement. It can generate abundant practice and guidance; it should not certify competence independently. Moodle remains the formal completion system, while trainers retain authority over higher-order evaluation. This division makes the AI-based self-evaluation system credible, sustainable and defensible under D3.2.

Chapter 5. Training Materials Repository and Multilingual Content Layer

5.1 Function of the Repository within D3.2

This chapter defines the material layer of the Smart Training Module. Its task is narrow but decisive: to show how the training resources connected to 147 curriculum topics are stored, named, accessed, reused and translated without forcing the report to reproduce thousands of individual files. The repository is not treated as a passive archive. It is the evidence-bearing content layer that allows Moodle, YouTube and EPD-Assist to operate on the same curriculum structure.

The scale of the material base makes a conventional annex impractical. The current digital package contains several thousand files across videos, PowerPoint presentations, transcripts, open-ended assignments, quiz banks and language versions. Embedding that volume inside the deliverable would not improve accountability. It would create a dead document: heavy, quickly obsolete and difficult to audit. The correct reporting choice is therefore to document the repository architecture, access points, material taxonomy, language logic and update protocol, while the live files remain in controlled cloud folders.

This is also the only defensible way to preserve D3.2 as a web-based application deliverable. A smart training module is not proven by file mass. It is proven by the ability to move from a topic code to a Moodle course, from the Moodle course to the video, from the video to the downloadable materials, from the materials to assignment and quiz evidence, and from that evidence to completion and certification. The repository supports that chain.

5.2 Material Taxonomy and Topic-Level Packaging

Each topic is expected to operate as a complete learning object, not merely as a video entry. The minimum material package contains the course video, the English PowerPoint file used in video production, translated PowerPoint versions in the project languages, the English transcript, translated transcripts, open-ended self-evaluation assignments and quiz questions. The package is therefore pedagogically layered: viewing, reading, conceptual clarification, written application and diagnostic testing.

The English materials function as the production spine. The English transcript is particularly important because it stabilizes meaning before translation, supports automatic subtitle generation and provides a controlled reference for multilingual reuse. Translated PPTX files and translated transcripts extend the same content into the project languages without requiring a separate curriculum for each language. This distinction should remain visible in D3.2 reporting: multilingual delivery is achieved through controlled transformation of a master content layer, not through unrelated parallel materials.

Open-ended assignments and quiz items form the self-evaluation layer of the material package. For each lesson, three open-ended assignments are available for formative application, while quiz item sets contain 10+ questions depending on the topic. These materials do not simply test recall. They make the learner pass through explanation, method interpretation, application and feedback before course completion is claimed.

Table 5.1. Topic-Level Material Package

Material object	Primary function	Language logic	Use in the learning sequence
Course video	Delivers the core lecture and topic explanation.	Produced from English scripts and supported by YouTube subtitle and auto-translation functions.	First learning object accessed through Moodle and YouTube.
PowerPoint presentation	Provides the visual and conceptual structure used for video production.	English master file and project-language translations.	Downloaded after or alongside the video for structured review.
Transcript	Creates the textual evidence base for review, translation, accessibility and reuse.	English transcript plus project-language translations.	Required reading layer before the open-ended assignment.
Open-ended assignment	Requires learner application, reflection or case-based interpretation.	Prepared in project languages from the master assignment logic.	Unlocks or precedes the quiz stage in the controlled Moodle flow.
Quiz item set	Provides diagnostic self-evaluation and completion evidence.	Five to twenty questions per lesson, available in project languages.	Supports Moodle scoring, attempt management and completion rules.
Repository link	Connects learners to the correct digital folder for the topic.	Displayed through Moodle and YouTube descriptions where relevant.	Prevents learners from searching across uncontrolled file locations.

5.3 Distributed Google Drive Repository

The repository is distributed across three Google Drive locations. This is a deliberate sustainability decision, not an organisational defect. Free Google accounts have storage limits, while the training-material package has grown beyond the capacity of a single free account. Splitting the repository allows the consortium to maintain post-project access without creating a paid dependency that may disappear after the funding period.

The design has a trade-off. A distributed repository reduces cost and improves sustainability, but it can also introduce fragmentation if links are not controlled. D3.2 must therefore treat the three Drive folders as a single logical repository. The controlling elements are topic codes, folder naming, Moodle course placement, YouTube descriptions and the roadmap or index maintained by the project team. The learner should experience one curriculum system, even when files are physically stored in different cloud accounts.

Repository links are also embedded in the description fields of the relevant YouTube videos. This creates a second access route for learners who enter the system through YouTube rather than Moodle. The official completion pathway remains Moodle-based, but the YouTube description layer makes the material package discoverable and supports wider dissemination.

Table 5.2. Repository Access Points

Repository component	Access point	Function	Control note
Google Drive Repository 1	https://drive.google.com/drive/u/1/folders/1g_HuGNRrKOO80pdA3Dihs7o-of8gOJ14	Stores part of the multilingual training-material package. Drive1: Epdnet-topics-101-1703	Maintained as one segment of the full repository architecture.
Google Drive Repository 2	https://drive.google.com/drive/folders/1udsp1IfYDwg1aWGLc2dTZYiC9-66rvlB?usp=sharing	Stores part of the multilingual training-material package. Drive2: Epdnet-topics-1801-3503	Used because free account storage limits require distributed storage.
Google Drive Repository 3	https://drive.google.com/drive/folders/1bgDMfxsNk0D30vGlc4bK0nKokYjfm64m?usp=sharing	Stores part of the multilingual training-material package. Drive3: Epdnet-topics-3601-6403	Should remain linked through Moodle, YouTube descriptions and repository index.
YouTube video descriptions	https://www.youtube.com/@EPD-Net/videos	Expose topic-related material links beside the training videos.	Supports dissemination but does not replace Moodle completion evidence.

5.4 Multilingual Content Production Logic

The multilingual layer is built on a practical sequence. Video production starts from English PowerPoint files and English transcript scripts. Those files create a stable master version. The PPTX files and transcripts are then translated into the project languages and placed in the repository and Moodle course structure. YouTube provides an additional subtitle layer because the English transcript and caption base allow automatic subtitle and translation functions to extend access beyond the original production language.

This model is realistic for a large Erasmus+ training system. Producing separate videos in every language for 147 topics would multiply cost, file volume and maintenance burden. The chosen model separates the stable pedagogical content from the access layer: the video gives the common lecture object; the transcript and translated PPTX provide language-specific review; Moodle controls progression; EPD-Assist supports multilingual conceptual explanation and academic mentoring.

The quality risk is semantic drift. Key concepts such as ecological planning, resilience, vulnerability, exposure, adaptive capacity, green-blue infrastructure, ecosystem services, digital twins, AI-supported risk mapping and nature-based solutions should not change meaning across languages. For that reason, the English transcript should remain the master textual reference, while translated materials should preserve topic codes, competence claims and assessment logic.

5.5 Relationship between Repository, YouTube and Moodle

The repository does not stand alone. It becomes meaningful only through its relation to YouTube and Moodle. YouTube carries the video layer and programme-based playlist access. Google Drive carries the expanded material layer. Moodle carries enrolment, sequencing, conditional access, assignment

submission, quiz activation and certification. When these three layers are connected through topic codes and course links, D3.2 becomes a controlled learning environment rather than a scattered digital archive.

The material route should remain simple for the learner. The participant enters a Moodle topic course, watches the embedded YouTube video, accesses the PPTX and transcript in the relevant language, completes the open-ended assignment, proceeds to the quiz and receives completion recognition when the Moodle criteria are met. If the participant enters through YouTube, the video description provides a path back to the supporting materials. EPD-Assist can guide the learner conceptually, but Moodle remains the formal record system.

This separation is important. YouTube is excellent for scalable access; Google Drive is efficient for file distribution; Moodle is necessary for controlled learning evidence; EPD-Assist is suited for mentoring and formative guidance. None of these platforms should be forced to perform the function of the others. The quality of D3.2 comes from role discipline across platforms.

5.6 Material Evidence and Auditability

The repository must be auditable without becoming unreadable. The project should therefore retain evidence at the level of folder structure, topic code, file type, language version and access link. A reviewer does not need 7,000 file names printed inside the report. A reviewer needs to see that the system can locate the material for a given topic, verify that the correct language versions exist, confirm that the video and transcript are available, and understand how the assignment and quiz are attached to Moodle progression.

The strongest evidence set for D3.2 is a combination of live links, QR codes, selected screenshots, repository index tables and Moodle examples. This combination proves existence, access and use. It also avoids the false precision of a printed file inventory that will become outdated as soon as one link, subtitle, transcript or assignment is corrected.

For internal quality assurance, the repository should be checked through four controls: completeness, consistency, accessibility and version discipline. Completeness asks whether each active topic has the required material package. Consistency asks whether file naming and topic codes match Moodle and YouTube. Accessibility asks whether learners can open the files without broken permissions. Version discipline asks whether updates are recorded without leaving obsolete files as active learning objects.

Table 5.3. Minimum Repository Quality Controls

Control area	Question to verify	Minimum evidence	Risk if uncontrolled
Completeness	Does the topic have video, PPTX, transcript, assignment and quiz materials?	Topic checklist or repository index.	Incomplete courses remain visible in Moodle or YouTube.
Consistency	Do topic codes, file names and course titles match across platforms?	Cross-check between Moodle, Drive and YouTube.	Learners access the wrong material or wrong language version.
Accessibility	Can authorised learners open and download the files?	Permission check and sample learner test.	Materials exist but cannot be used.
Version discipline	Are revised materials clearly separated from obsolete versions?	Version note or controlled file naming.	Old files continue to circulate after correction.
Language traceability	Can each translated file be traced to the English master?	Language folder and master-file reference.	Translations drift away from the approved curriculum claim.

5.7 Chapter Implementation Statement

Chapter 5 establishes the repository and multilingual content layer as a controlled component of D3.2. Its central claim is practical: the training materials should remain in live digital repositories, while the report documents the architecture that makes those repositories interpretable, traceable and usable. This is not a downgrade from formal reporting. It is the only proportionate method for a smart training module with 147 topics and several thousand learning files.

The material architecture should therefore be judged through access, structure and evidence rather than through printed volume. Each topic must be connected to its video, PPTX, transcript, open-ended assignments, quiz items and language versions. Each platform must keep its role: YouTube for video dissemination, Google Drive for material storage, Moodle for controlled progression and certification, EPD-Assist for academic guidance and formative self-evaluation. When this division is respected, D3.2 becomes sustainable after the project period without losing auditability.

The next chapter examines the YouTube playlist architecture and programme-based learning pathways, showing how the video layer turns the 147-topic material base into accessible routes for planning, landscape architecture, civil engineering, architecture, VET, local government and other users.

Chapter 6. YouTube Playlist Architecture and Programme-Based Learning Pathways

6.1 Function of the YouTube Layer

This chapter defines the YouTube layer of D3.2. Its function is not simply to host videos. It converts the large topic catalogue into navigable learning pathways, gives learners a direct video entry point, and supports dissemination beyond the Moodle login environment. Moodle remains the formal learning and certification system; YouTube provides scalable access to the audiovisual teaching objects and to programme-based playlists.

The distinction is important. A YouTube channel alone would not satisfy D3.2, because it cannot by itself control assignment submission, quiz access, learner progression or certificate generation. Within the EPD-Net architecture, however, YouTube becomes a valid delivery component because each video is linked back to the wider material package and to the Moodle course structure. The video layer therefore serves access, orientation and dissemination, while Moodle preserves assessment and completion evidence.

The EPD-Net channel has two primary entry points: the playlist page for structured pathways and the video page for direct access to individual topic videos. These entry points should be reported as live digital access points rather than as a printed video inventory. The report must explain their instructional logic; the channel itself carries the evolving video objects.

6.2 Playlist Logic and Programme-Based Routing

The playlist architecture is built around professional and educational routes rather than a single chronological catalogue. This is the right decision for a 147-topic system. Most learners will not enter the module asking for the entire curriculum. They will enter through a need: planning, landscape architecture, civil engineering, architecture, VET, municipal implementation, GIS, risk mapping, policy or nature-based design. Playlists convert that need into a route.

The programme-based playlists also protect D3.2 from a common failure of large online repositories: abundance without orientation. A learner confronted with hundreds of videos can easily lose the curricular thread. A planner needs urban form, density, zoning, participatory governance and GIS. A landscape architect needs green infrastructure, habitat continuity, watershed logic and planting strategy. An engineer needs infrastructure vulnerability, stormwater systems, flood modelling and BIM. The playlist layer makes those distinctions operational.

The playlist structure should therefore be treated as a pedagogical index. It does not replace D3.1. It translates the D3.1 pathways into visible video sequences and makes those sequences accessible from the public YouTube environment.

Table 6.1. Core Programme-Based Playlists

Playlist	Primary audience	Curricular focus	Topic clusters	D3.2 function
City and Regional Planning: Strategic Resilience and Urban Form	City and regional planning students, planners and urban policy actors.	Urban density, zoning, participatory processes, strategic resilience and GIS-based spatial analysis.	301-303; 1501-1503; 1601-1603; 1701-1703; 2601-2603; 2801-2803; 2101-2103; 2901-2903	Routes planning users from risk recognition to morphology, governance and spatial-data interpretation.
Landscape Architecture: Ecosystem-Oriented and Nature-Based Design	Landscape architecture students, designers and green infrastructure actors.	Nature-based planning, ecosystem services, connectivity, flood mitigation, planting and biodiversity corridors.	401-403; 501-503; 601-603; 1101-1103; 1201-1203; 1301-1303; 1401-1403	Frames ecological and landscape content as a coherent design pathway rather than a set of isolated green topics.
Civil Engineering: Resilient Infrastructure and Technical Solutions	Civil engineering students, infrastructure professionals and technical actors.	Critical infrastructure, stormwater, flood modelling, BIM and emergency shelter infrastructure.	2001-2003; 1901-1903; 3101-3103; 2501-2503; 3401-3403	Connects engineering users to resilience, hydrology, infrastructure safety and environmental impact integration.
Architecture: Climate-Responsive Design and Adaptation	Architecture students, architects and building-performance oriented learners.	Urban heat, circular design, retrofitting, digital twins, green roofs and parametric climate-responsive design.	701-703; 901-903; 1801-1803; 2301-2303; 3201-3203; 3501-3503	Builds a route from building and urban form to performance, adaptation and computational design.
Vocational Education and Local Government: Policy and Implementation Guide	VET learners, municipal staff and implementation actors.	Sustainable city principles, infrastructure equity, participation, EU policy, global climate politics and future scenarios.	101; 201; 202; 801-803; 1001-1003; 4101; 4103; 4201-4203; 4401-4403; 4503	Provides a compact implementation-oriented route for users who need policy literacy and operational understanding.

6.3 Video-to-Material Connection

Each YouTube video should be read as the visible opening layer of a larger learning object. The video introduces the topic, but the learning unit is only complete when the learner reaches the related PPTX, transcript, assignment, quiz and Moodle completion rule. This is why the video descriptions carry Google Drive links for the related learning materials. The description field is not an accessory; it is a routing device.

The public video route and the Moodle route are not identical, and they should not be presented as if they are. Through YouTube, the learner can watch videos and access supporting materials. Through Moodle, the learner enters the official sequence: embedded video, downloadable materials, transcript, open-ended assignment, quiz and completion certificate. D3.2 should preserve this hierarchy. YouTube supports access. Moodle controls learning progression.

This design also creates resilience in access. If a learner enters the system through a playlist, the video description can direct the learner to materials and to Moodle. If the learner enters through Moodle, the embedded video provides the audiovisual component inside the course shell. The two paths reinforce each other without confusing their evidentiary roles.

6.4 Subtitle and Translation Logic

The video layer also supports multilingual access. Videos are produced from English PowerPoint presentations and English transcript scripts. That English textual base allows subtitles to be generated and checked more reliably, while YouTube's automatic subtitle and translation functions extend the audiovisual content to a wider language environment. This is a pragmatic dissemination strategy for a large multilingual training system.

Automatic subtitle translation should be treated as an access-support mechanism, not as the sole authoritative language layer. The controlled language objects are the translated PPTX files, translated transcripts, Moodle course text, assignments and quiz items stored in the project repositories and course shells. YouTube captions widen reach; Moodle and the repository preserve controlled learning content.

This distinction avoids a real quality problem. Automatic captions can improve accessibility, but they may not preserve technical terminology with sufficient precision. For ecological planning, disaster resilience, GIS, AI-supported risk mapping or nature-based solutions, terminological stability matters. Trainers and learners should therefore use the transcript and Moodle materials as the controlled reference when assessment or formal completion is involved.

6.5 Relationship with D3.1 Learning Pathways

The playlists should be interpreted through the D3.1 curriculum pathways. The D3.1 report establishes the curricular logic, programme differentiation, EQF orientation and topic-level traceability. Chapter 6 of D3.2 shows how that curriculum becomes a public-facing video structure. The connection is not cosmetic: playlist membership is a delivery decision that determines which topics are placed before which learner group and in what conceptual order.

For city and regional planning, the route emphasises urban form, density, governance and spatial evidence. For landscape architecture, it prioritises ecological connectivity, water, vegetation and ecosystem services. For civil engineering, it foregrounds infrastructure performance, flood risk and BIM. For architecture, it links building and urban form to climate-responsive performance. For VET and local government, it compresses the curriculum into a policy and implementation pathway. This is programme-based routing, not content duplication.

The same topic may still serve several pathways. That is acceptable and useful. A topic on GIS or green infrastructure may support planning, engineering and landscape architecture, but its interpretation changes by pathway. The playlist does not alter the topic identity; it changes the learner's route through the topic ecosystem.

Table 6.2. YouTube Layer and Formal Learning System

System element	Main role	What it proves	Boundary
YouTube channel	Public access to training videos and playlist pathways.	The audiovisual layer is available and organised for dissemination.	Does not certify learner completion.
YouTube playlists	Programme-based routing across topic videos.	The curriculum is translated into discipline and user-oriented pathways.	Does not replace D3.1 curriculum governance.
YouTube descriptions	Material routing through links to Google Drive resources.	Videos are connected to supporting files rather than isolated media objects.	Links must remain maintained and periodically checked.
Moodle embed	Places the video inside the official course sequence.	The video is part of controlled progression inside the LMS.	Formal assessment remains Moodle-based.
Subtitle layer	Supports multilingual access and repeated review.	The video layer can reach users beyond the English source text.	Automatic translation is not the authoritative assessment text.

6.6 Playlist Governance and Maintenance

The playlist layer requires light but strict governance. Playlist titles should remain stable, because they function as external navigation labels. Topic ordering should follow pathway logic, not upload chronology. Video descriptions should retain the relevant material links. If a topic video is revised, the old video should not remain as the active item in a formal playlist unless version status is clear.

The maintenance burden is manageable if the project uses a small set of controls. Each playlist should be checked for broken links, missing videos, misplaced topic codes, obsolete descriptions and mismatch with Moodle course objects. The check does not need to become a large administrative exercise. It should be tied to the same roadmap used for the training materials and Moodle course inventory.

The system also needs a clear response to future expansion. New playlists may be created for emerging needs, such as risk mapping, nature-based intelligence, municipal implementation or professional upskilling. Such playlists should be treated as additional routes through the same topic base, not as new curricula unless their learning outcomes and assessment logic are formally defined.

6.7 Chapter Implementation Statement

Chapter 6 establishes the YouTube playlist architecture as the public audiovisual routing layer of D3.2. Its value lies in orientation. It makes a large, topic-rich curriculum usable by different audiences without forcing every learner into the same sequence. It also extends dissemination beyond the Moodle environment while preserving Moodle as the formal progression, assessment and certification platform.

The evidence logic is precise. YouTube demonstrates access to videos and structured pathways. Google Drive demonstrates access to the wider material package. Moodle demonstrates progression, assignment submission, quiz access, completion and certificate generation. EPD-Assist demonstrates academic mentoring and formative self-evaluation. The playlist layer is strongest when it respects that division of labour.

The next chapter should focus on completion, certification and evidence logic. That chapter will translate the Moodle and assessment rules into a defensible reporting framework for D3.2: what counts as completion, what counts as self-evaluation, what counts as learning evidence, and how the system can be audited without printing thousands of files.

Chapter 7. Completion, Certification and Evidence Logic

7.1 Completion as Evidence, Not Administration

This chapter defines the completion, certification and evidence logic of the EPD-Net Smart Training Module. Its function is narrow but decisive. D3.2 cannot be defended only by showing that videos, PowerPoint files, transcripts, assignments and quizzes exist. It must show that learners move through these objects in a controlled sequence, that each step generates evidence, and that the final certificate is triggered by demonstrable performance rather than passive access.

The Moodle layer is therefore not a storage interface. It is the formal learning-control environment of D3.2. YouTube opens access to the lecture video. Google Drive sustains the material repository. EPD-Assist provides academic mentoring and formative self-evaluation. Moodle binds these elements into a governed progression: enrolment, video access, required learning materials, open-ended assignment, quiz, pass threshold and certificate. The quality of D3.2 depends on this chain remaining intact.

The central distinction is simple and non-negotiable. Viewing a video is participation. Downloading a transcript is preparation. Submitting an open-ended assignment is evidence of engagement. Passing the quiz is evidence of minimum conceptual mastery. Receiving a certificate is the platform record that the configured completion conditions have been met. These actions are related, but they are not equivalent.

7.2 Evidence-Producing Learning Sequence

Each topic course should operate through a fixed progression. The learner first enters the Moodle course shell for the selected topic. The embedded YouTube video is encountered as the first learning object because it gives a compact conceptual and methodological orientation. The learner then accesses the related PowerPoint presentation and transcript in the relevant project language. The transcript is not an optional accessory. It supports accessibility, multilingual review, slower reading, quotation checking and preparation for written work.

The open-ended assignment functions as the interpretive bridge between content exposure and quiz eligibility. It forces the learner to convert received material into a written or applied response. This is essential because a purely quiz-based system would reward recognition without requiring argument. In the EPD-Net model, the assignment stage prevents the platform from reducing ecological planning and design to multiple-choice recall.

The quiz becomes available after the assignment condition is met. This sequencing is educationally sound. The quiz checks whether the learner has retained and understood the minimum conceptual and methodological content after engaging with video, slides, transcript and assignment. The certificate is then generated only when the learner has reached the required score. Completion is therefore not an attendance marker. It is a controlled record of staged learning activity.

Table 7.1. Evidence Chain from Access to Certification

Step	Learner action	Evidence retained	Quality function
Course enrolment	Learner enters the Moodle course for a defined topic.	Topic course shell, enrolment record and access log.	Connects the learner to a specific curriculum object.
Video access	Learner watches or accesses the embedded YouTube lecture.	Embedded video object and access trace where available.	Introduces the conceptual and methodological frame.
Material review	Learner uses the PowerPoint file and transcript in the selected language.	Download or access record for PPTX and transcript.	Supports multilingual and evidence-based preparation.
Open-ended assignment	Learner prepares and uploads the required task.	Assignment submission, timestamp and file record.	Produces written or applied evidence before quiz access.
Quiz attempt	Learner answers a randomized set of questions.	Attempt log, score, question bank trace and completion status.	Checks minimum topic mastery under controlled conditions.
Certificate	Certificate is generated after the pass threshold is reached.	Certificate record linked to learner, topic and completion rule.	Documents successful completion for the specific topic.

7.3 Assignment Gateway and Assessment Discipline

The open-ended assignment gateway is one of the strongest elements of the D3.2 design. It creates a minimum interpretive threshold before the quiz opens. The learner must engage with the topic beyond passive viewing and must produce an answer, reflection, case interpretation, planning note or applied response. This design is especially important in ecological planning and disaster resilience because many competences cannot be inferred from recognition-level questions alone.

The assignment does not need to carry the full burden of grading in every topic. Its primary function in D3.2 is progression control and formative evidence. It demonstrates that the learner has reached the point where quiz-based verification is meaningful. For advanced delivery routes, trainers may review assignments in greater depth and connect them to EPD-Assist-supported feedback. For self-paced delivery, the assignment still preserves the concept-method-application sequence embedded in the Moodle common course information text.

The design also protects the certificate. A certificate issued after video viewing alone would be weak. A certificate issued after unrestricted quiz guessing would be administratively convenient but educationally thin. The assignment gateway creates friction in the right place. It slows the learner long enough to require interpretation before score-based completion.

7.4 Quiz Rule, Randomisation and Pass Threshold

The quiz configuration should be read as a reliability mechanism. Each quiz attempt presents ten questions, each worth ten points, giving a total score of one hundred. The pass threshold is sixty out of one hundred. This threshold is realistic for a modular self-learning environment: it requires evidence of basic competence without pretending that a short topic course can certify advanced professional mastery.

Randomisation strengthens the validity of repeated attempts. The question set changes at each entry, and the answer options are also randomly ordered. This reduces memorisation of position, limits answer sharing, and supports a fairer distribution of assessment exposure across learners. The learner has three attempts to reach the pass threshold. The attempt limit matters. Unlimited attempts would turn assessment into persistence gaming; a three-attempt configuration allows correction while preserving the seriousness of the certificate. The only unlimited element in the system is formative practice outside Moodle, supported by EPD-Assist; the certificate-bearing Moodle quiz remains limited to three formal attempts.

Any generic course information text visible to learners must match the final Moodle configuration before public delivery. If the platform is configured for three attempts, the course text should not imply unlimited attempts. This is not a cosmetic issue. Inconsistency between platform rule and learner-facing instruction weakens trust and creates avoidable audit risk.

Table 7.2. Quiz and Certification Rules

Element	Configured rule	Evidence value
Question set	Ten questions per attempt.	Keeps each topic assessment compact and repeatable.
Scoring	Ten points per question, one hundred points in total.	Creates a transparent and comparable scoring structure.
Pass threshold	Minimum sixty out of one hundred.	Defines successful topic completion.
Attempts	Three attempts for each learner.	Allows remediation without weakening assessment discipline.
Random questions	Questions are drawn randomly at each attempt.	Limits rote repetition and answer circulation.
Random options	Answer choices are randomly reordered.	Reduces positional memorisation.
Certificate trigger	Certificate is generated only after successful completion.	Links credential output to platform evidence.

7.5 Certificate Generation and Credential Meaning

The Moodle certificate is a topic-level completion record. It should not be overstated as a professional licence, a degree credential or an institutional qualification outside the defined scope of the Smart Training Module. Its evidentiary meaning is precise: the learner enrolled in a topic course, passed

through the required activity sequence, completed the assignment gateway, reached the quiz threshold and satisfied the platform rule for that topic.

This restrained definition actually strengthens D3.2. It prevents inflation. It makes the certificate defensible because the claim is proportional to the evidence. A topic certificate can document completion of a specific learning unit. A playlist or programme pathway can aggregate several topic completions into a larger learning route. Formal recognition, where pursued later through Europass or institutional CPD mechanisms, should build on these records rather than exaggerate them.

Certificate generation should remain inside Moodle because Moodle is the environment where progression rules and evidence records are controlled. YouTube cannot issue formal training evidence; Google Drive cannot verify learner performance; EPD-Assist cannot certify completion. Each platform has value, but only Moodle has the configured sequence, assessment rule and certificate trigger required for D3.2 reporting.

7.6 Evidence Package for D3.2 Verification

D3.2 should be verified through a compact evidence package rather than through a massive archive of all files. The material volume is too large for direct report reproduction, and direct reproduction would not prove system quality. The correct evidence consists of access links, QR codes, sample course screenshots, sample topic course structures, playlist evidence, Google Drive folder logic, EPD-Assist access, sample assignment objects, sample quiz configuration and sample certificate output.

The evidence package should show the system working at the level of a topic. One topic course should be sufficient as a demonstrator if it clearly shows the embedded video, multilingual materials, transcript requirement, assignment gateway, quiz rule and certificate generation. Additional examples from different programme pathways can be included to prove that the model is not isolated. The report should not drown reviewers in thousands of files. It should give them enough traceable evidence to understand the architecture and test access.

The strongest verification logic is replicability. A reviewer should be able to follow the route from D3.1 topic code to YouTube video, from YouTube description to Drive material folder, from Moodle topic course to transcript and assignment, from assignment to quiz, from quiz to certificate. If this route is visible, D3.2 is defensible. If it is hidden behind unsorted links, the deliverable becomes fragile regardless of file volume.

Table 7.3. Minimum Evidence Package for D3.2 Verification

Evidence type	What should be shown	Why it matters
Access evidence	YouTube channel, playlist page, Moodle URL, Google Drive repositories, EPD-Assist GPT link and project web page.	Shows that the digital entry points exist and are reachable.
Course evidence	Representative Moodle topic page with embedded video, multilingual materials and conditional progression.	Shows that the LMS implements the learning sequence.
Assessment evidence	Assignment object, quiz settings, random question behaviour, pass threshold and attempt rule.	Shows that self-evaluation is not merely descriptive.

Credential evidence	Sample certificate generated after completion.	Shows the final output of the learning-control sequence.
Repository evidence	Folder structure and material package for selected topics.	Shows that materials are organised without reproducing every file.
Sustainability evidence	Use of public or low-cost platforms and distributed repository links.	Shows that access can continue after the project period.

7.7 Quality Controls and Reporting Risks

The first risk is credential inflation. The report must not present topic certificates as evidence of mastery beyond the level tested by the quiz and assignment. The second risk is platform inconsistency. Links in YouTube descriptions, Moodle pages and Google Drive folders must remain aligned with topic codes and current material versions. A broken or outdated link weakens the evidence chain even if the material exists somewhere else.

The third risk is assessment inconsistency. Question banks must remain linked to the relevant topic, and translated quiz items must preserve the same competence claim. Randomisation improves fairness, but randomisation cannot repair a weak or misaligned question bank. The fourth risk is learner-facing ambiguity. Rules about assignment submission, quiz eligibility, attempt limits, pass threshold and certificate generation must be stated consistently across Moodle course texts and supporting guidance.

These risks require a modest maintenance protocol. Each topic should have a named material package, a stable Moodle course shell, a checked YouTube link, a checked Drive folder link, a current assignment object, a current quiz bank and a certificate rule. The review does not need to be bureaucratic. It needs to be systematic enough to prevent a large digital system from degrading into disconnected objects.

7.8 Chapter Implementation Statement

Chapter 7 establishes the evidence logic of D3.2. The Smart Training Module becomes credible because it connects access, learning, assignment, quiz, completion and certification inside a controlled Moodle sequence while using YouTube, Google Drive and EPD-Assist for their proper supporting functions. This division of labour is the main quality safeguard of the system.

For final reporting, the consortium should present this chapter together with QR-coded access points, sample Moodle screenshots, representative topic-course evidence, quiz configuration evidence and at least one sample certificate. The aim is not to display all materials. The aim is to prove that the system can convert a curriculum topic into a traceable learning experience with multilingual access, AI-supported mentoring, assessment discipline and auditable completion records.

Chapter 8. Sustainability, Maintenance and Post-Project Access Protocol

8.1 Sustainability as an Implementation Requirement

This chapter defines how the D3.2 digital system should remain accessible, usable and verifiable after the initial delivery phase. Sustainability is not treated here as a public-relations claim. It is a design condition of the Smart Training Module. A web-based application that depends on expensive, closed or short-lived infrastructure would weaken the project after the funded period. The present architecture therefore uses a deliberately distributed set of entry points: Moodle for controlled learning progression, YouTube for video dissemination, Google Drive for the material repository, EPD-Assist GPT for academic mentoring and AI-supported self-evaluation, and the project web page for public orientation.

The design choice is pragmatic and defensible. The module contains 147 topic-level courses and several thousand learning objects across languages, formats and assessment types. Placing every file inside a single report would create a dead archive. The project instead keeps the operational material in live digital repositories and uses D3.2 to document how these repositories are connected, governed and evidenced. This is the correct standard for a web-based deliverable: the report must prove system logic, not reproduce the entire system on paper.

The maintenance principle is strict. Each public or restricted link must have a defined function. YouTube gives broad video access and automatic subtitle support. Google Drive stores the actual material packages. Moodle controls progression, assessment and certificates. EPD-Assist GPT supports orientation, explanation, practice and self-evaluation. None of these layers should be allowed to drift into an isolated channel. The topic code remains the common key that binds them together.

8.2 Platform Choices and Sustainability Rationale

The use of YouTube, Google Drive and GPT-based assistance is a deliberate sustainability strategy, not an improvised convenience. These tools reduce the risk that learning materials become inaccessible when project-specific hosting budgets end. They also support multilingual reach: English subtitle scripts allow YouTube to generate automatic captions and translations, while the LMS and repositories provide translated PowerPoint files, translated transcripts, open-ended assignments and quiz items in the project languages.

Moodle remains the formal learning environment because it can impose sequence, record completion and issue certificates. YouTube cannot perform that role. Google Drive cannot perform that role. EPD-Assist GPT cannot perform that role. This separation is a strength. Public platforms maximise access; Moodle protects assessment integrity. The architecture becomes sustainable precisely because each component performs one task well rather than pretending to be a complete system.

The Google Drive repository is distributed across three free accounts because the volume of training objects exceeds the storage capacity of a single free account. This is acceptable only if the distribution remains transparent. The report should therefore state that storage distribution is an infrastructure decision, not a curriculum division. Learners and trainers should not experience three repositories as three separate systems. Topic codes, YouTube descriptions and Moodle course links must guide them to the correct package.

Table 8.1. Sustainability Role of Each Digital Component

Component	Primary function	Sustainability value	Boundary
Moodle LMS	Controls enrolment, sequencing, assignment submission, quiz access, completion tracking and certificates.	Keeps formal learning evidence in a structured platform linked to topic-level courses.	Not a long-term repository for every raw production file.
YouTube Channel	Hosts training videos and programme-based playlists.	Provides broad access, visibility, automatic subtitles and low-cost post-project dissemination.	Does not certify completion or replace Moodle assessment.
Google Drive Repositories	Store PPTX files, transcripts, assignments, quiz banks and language versions. **Drive1: Epdnet-topics-101-1703** **Drive2: Epdnet-topics-1801-3503** **Drive3: Epdnet-topics-3601-6403**	Preserves large material packages without forcing thousands of files into the report.	Requires stable folder logic, controlled sharing and periodic link checks.
EPD-Assist GPT	Supports academic mentoring, multilingual explanation, quiz practice, case-task generation and formative self-evaluation.	Extends learner support without requiring permanent human tutoring for every topic.	Does not issue formal grades or certificates.
EPD-Net Website	Provides public project orientation and visibility.	Offers a stable public gateway to project identity, partners and learning hub information.	Should not be the only location of course-level evidence.
QR and Hyperlink Layer	Connects the report to live digital entry points.	Makes the deliverable usable for reviewers, trainers and learners.	Must be rechecked whenever links or permissions change.

8.3 Link Governance and Version Control

D3.2 depends on live links. That makes governance essential. A broken link in this deliverable is not a minor formatting defect; it interrupts the learning chain. The minimum control is a link register containing the destination, owner, access condition, last verification date and replacement procedure. The register should cover Moodle, the YouTube channel, playlist pages, Google Drive repositories, EPD-Assist GPT, the project website and any complementary decision-support tools.

Version control should be applied at the level of learning objects. A revised transcript, translated PowerPoint, new quiz bank or updated assignment should not silently replace the previous file without a record. The stable element is the topic code. The modifiable elements are file version, language

version, platform location and access permission. This distinction prevents the system from losing traceability when materials are improved.

Public links and restricted links require different treatment. YouTube videos and public pages can be cited directly. Moodle access may require authorised credentials. Google Drive folders may use view permissions or controlled access depending on the material. The report should not expose passwords or administrative credentials. It should state that reviewer access credentials are provided separately where restricted access is necessary.

Table 8.2. Minimum Link and Version-Control Register

Digital object	Required record	Maintenance rule
Moodle course shell	Topic code, course URL, language availability, completion settings and certificate rule.	Verify before each pilot or public training cycle.
YouTube video or playlist	URL, playlist pathway, topic coverage, subtitle status and linked material location.	Check after video upload, playlist revision or description update.
Google Drive folder	Repository URL, folder owner, material type, language coverage and sharing permission.	Audit permissions and folder structure before external review.
EPD-Assist GPT	GPT link, permitted use, self-evaluation function and formal assessment boundary.	Review prompt behaviour when curriculum metadata or materials change.
QR code	Encoded URL, page location in report and last test date.	Regenerate if the underlying link changes.

8.4 Repository Maintenance and Storage Distribution

The material repository should be maintained as an operational archive, not as a dumping ground. Each topic should retain a recognisable package: video reference, English subtitle script or transcript, translated transcript where available, translated PowerPoint files, open-ended assignments and quiz items. The user should be able to move from Moodle or YouTube to the related material folder without guessing.

Because the repositories are split across three Google Drive accounts, the maintenance protocol must prevent hidden fragmentation. The simplest rule is to maintain one master index. The index should identify which topic package is stored in which Drive location and whether the materials are complete in each project language. If a topic is moved from one account to another, the YouTube description, Moodle link and index must be updated together. Partial updating is the main risk.

The system should avoid needless duplication. Duplicate folders create uncertainty when trainers update materials. Where duplication is unavoidable for backup purposes, the active version must be marked clearly. The report should distinguish between production copies, active learner-facing copies and archival backups. Without that distinction, the consortium will eventually lose control of which file is authoritative.

8.5 Access Roles and Public Visibility

The access model should remain simple. Learners need clear entry to Moodle courses, video materials, transcripts, assignments and quizzes. Trainers need access to course settings, learner progress and

evidence records. Administrators need access to repositories, enrolment settings, certificate configuration and link registers. Reviewers need enough access to verify that the system exists and operates as described. Public users may reach YouTube and selected open resources, but formal completion remains inside Moodle.

EPD-Assist GPT and Nature-Based Intelligence GPT should be described with different system roles. EPD-Assist GPT is part of the official D3.2 learning-support and AI-supported self-evaluation architecture. Nature-Based Intelligence GPT is a complementary public decision-support and nature-based reasoning resource. It supports ecological interpretation, nature-based solution exploration, urban resilience scenarios and Nature Cities Alliance-related decision questions. It should not be framed as a contractual substitute for EPD-Assist, Moodle-based assessment or topic-level certification. This distinction protects the deliverable from overclaiming while still acknowledging a useful extension of the EPD-Net digital ecosystem. The project website should function as a public orientation layer. It gives the project identity, learning hub visibility and general access context. It should point users toward the learning system, but it should not be burdened with the full material archive or formal assessment role. That role properly belongs to Moodle and the structured repositories.

8.6 Post-Project Continuity and Risk Controls

The post-project risk is not only technical failure. The more likely risk is gradual disorder: links change, permissions close, videos are reorganised, Drive folders multiply, quiz banks are revised without version notes, and Moodle course shells stop matching the repository. D3.2 should anticipate this risk. Continuity requires periodic link checks, repository audits, Moodle course review and controlled updates to EPD-Assist instruction data.

The maintenance cycle should be realistic: quarterly during piloting, then semi-annually after the project period. The check should confirm that core links open, playlists remain visible, Drive folders are accessible, Moodle rules still function, certificates generate and EPD-Assist directs learners toward validated resources. The objective is to prevent quiet decay.

The decisive control is ownership. Each digital layer needs a responsible institution or technical owner. A distributed system without ownership is fragile; a distributed system with link governance, version control and access rules is resilient.

Table 8.3. Post-Project Maintenance Risks and Controls

Risk	Likely consequence	Control
Broken Moodle or repository link	Learner cannot reach the required material or reviewer cannot verify the system.	Maintain a link register and test all core links before reporting cycles.
Uncontrolled Drive permission change	Materials exist but become invisible to authorised users.	Assign repository owners and audit sharing settings.
Playlist reorganisation without update	Programme-based pathways no longer match Moodle or D3.1 topic logic.	Update playlist descriptions and master index after every playlist change.
Quiz or assignment version drift	Completion evidence no longer matches the intended topic competence.	Record version changes and retain topic-code linkage.
AI guidance beyond validated content	Learners may receive unsupported or misaligned advice.	Keep EPD-Assist functions formative and anchored to verified topic metadata.

Risk	Likely consequence	Control
Overclaiming of auxiliary tools	Deliverable becomes vulnerable to quality criticism.	Separate contractual D3.2 components from optional public decision-support tools.

8.7 Chapter Implementation Statement

Chapter 8 establishes the sustainability and maintenance logic of D3.2. The Smart Training Module is sustainable not because it contains many files, but because access, sequencing, evidence and support are distributed across appropriate platforms without losing traceability. Moodle protects completion; YouTube extends reach; Google Drive preserves material packages; EPD-Assist GPT supports learning and self-evaluation; the website and QR layer make the system discoverable.

The implementation rule is direct. Every topic-level course must remain reachable, every material package identifiable, every assessment pathway controlled, and every certificate traceable to Moodle evidence. If these four conditions are protected, D3.2 can remain usable beyond the funded period without excessive hosting costs or unmanageable document volume.

Appendix 1. Digital Access Points and QR Codes

A1.1 Purpose of the Appendix

This appendix records the digital entry points through which D3.2 is accessed, used and verified. It is not a substitute for the Moodle course structure or the training-materials repository. Its function is narrower: to provide a controlled access sheet for reviewers, trainers, learners and partner institutions, and to prevent the core digital components of the Smart Training Module from being scattered across informal messages or undocumented links.

The architecture is deliberately distributed. Moodle controls formal learning progression and certification. YouTube provides scalable video access and subtitle-supported dissemination. Google Drive stores the large multilingual material packages. EPD-Assist GPT supports academic mentoring and AI-supported self-evaluation. The project website remains the public orientation point. The QR codes below make these components immediately reachable while preserving the distinction between public access, restricted learning evidence and supplementary support tools.

A1.2 Access Register

Component	Access Point	System Function	Status in D3.2
YouTube Playlists	https://www.youtube.com/@EPD-Net/playlists	Programme-based video pathways aligned with the curriculum routes.	Official dissemination layer
YouTube Videos	https://www.youtube.com/@EPD-Net/videos	Full video channel for topic-level training videos.	Official dissemination layer
EPD-Assist GPT	https://chatgpt.com/g/g-69f9df6fd9c48191ab3ccc1bacc8759f-epd-assist	Academic mentoring, self-evaluation, quiz practice, case support and learning-pathway guidance.	Official AI-support layer
GOOGLE DRIVES Drive1: Epdnet-topics-101-1703 Drive2: Epdnet-topics-1801-3503 Drive3: Epdnet-topics-3601-6403			
Google Drive Repository 1	https://drive.google.com/drive/u/1/folders/1g_HuGNRrKOO80pdA3Dihs7o-of8gOJ14	Training materials repository distributed because of storage volume.	Official repository layer
Google Drive Repository 2	https://drive.google.com/drive/folders/1udsp1IfYDwg1aWGLc2dTZYiC9-66rvlB?usp=sharing	Training materials repository distributed because of storage volume.	Official repository layer
Google Drive Repository 3	https://drive.google.com/drive/folders/1bgDMfxsNk0D30vGlc4bK0nKokYjfm64m?usp=sharing	Training materials repository distributed because of storage volume.	Official repository layer
Moodle LMS	https://epd-net.eskisehir.edu.tr	Formal enrolment, progression control, assignment upload, quiz, completion and certificate environment.	Official delivery and evidence layer
EPD-Net Website	https://www.epd-net.org	Public orientation and project gateway.	Project orientation layer
Nature-Based Intelligence GPT	https://chatgpt.com/g/g-69fb579a2db88191a2cdf00729230c7f-nature-based-intelligence	Supplementary nature-based decision-support resource.	Complementary, non-certification resource

A1.3 Use Protocol

Reviewers should use this appendix as an access layer, not as evidence of completion by itself. Completion evidence is produced inside Moodle through activity sequence, open-ended assignment submission, quiz performance and certificate generation. Google Drive links evidence the availability of materials; YouTube links evidence scalable video dissemination; EPD-Assist GPT evidences the AI-supported mentoring and self-evaluation layer. The QR codes are therefore entry mechanisms, not assessment records.

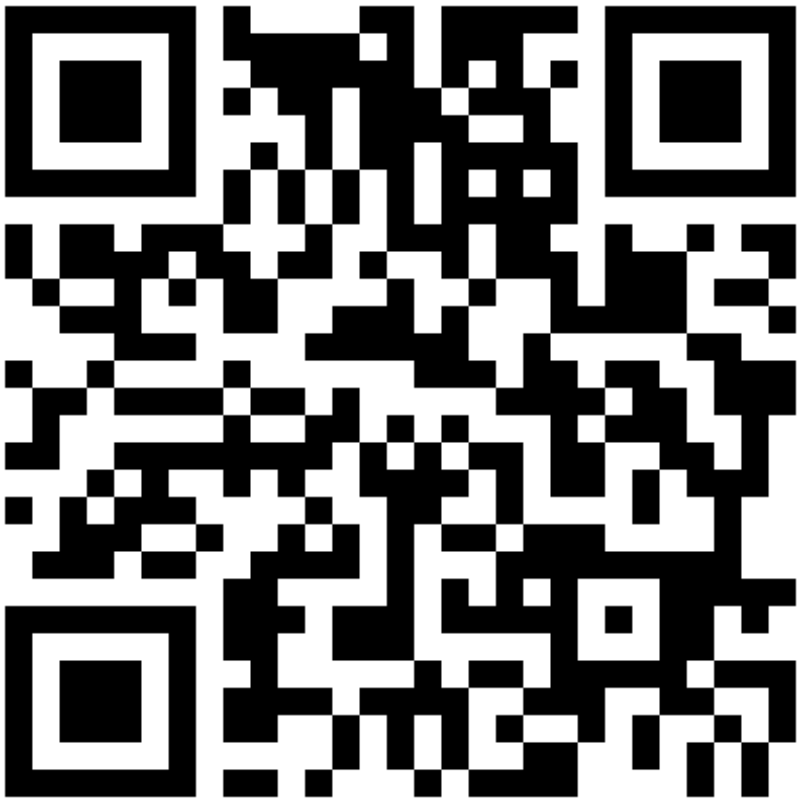
Where access is restricted by platform settings or user permissions, authorised reviewer credentials should be provided separately. Publicly readable links should remain stable during the reporting period. If any link changes, the access register and QR code page must be updated in the same version cycle; otherwise the report will retain a broken evidence path.

A1.4 QR Code Pages

The following pages provide full-size QR codes for the main digital entry points of D3.2. They are included to support printed review, meeting use, dissemination events and quick access during trainer orientation. The URLs are also written under each QR code to preserve accessibility when scanning is not possible.

Appendix 1.1 YouTube Playlists

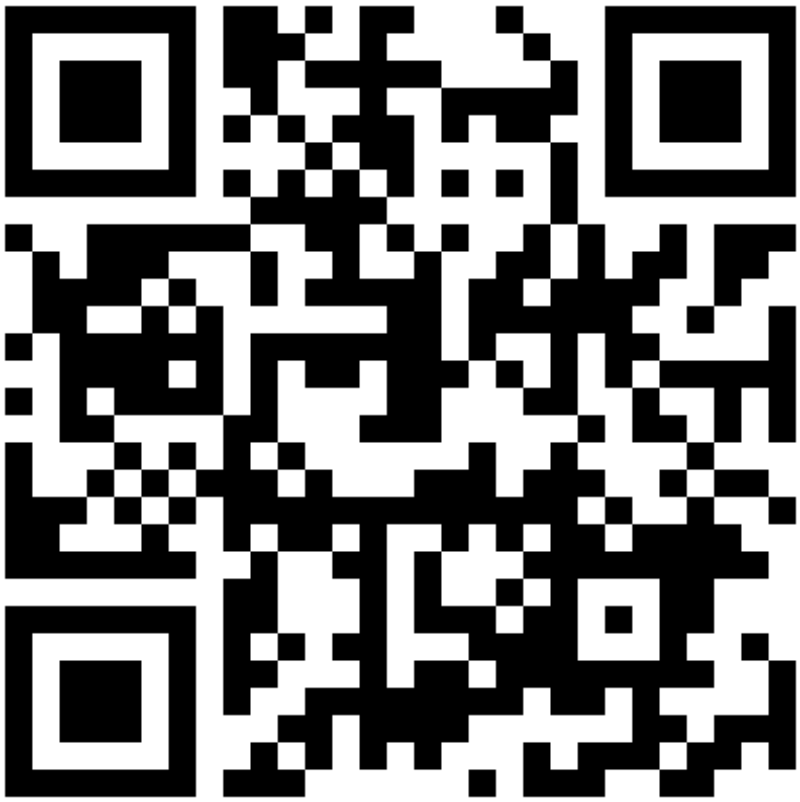
Programme-based video pathways for formal and informal learning routes.



https://www.youtube.com/@EPD-Net/playlists

Appendix 1.2 YouTube Videos

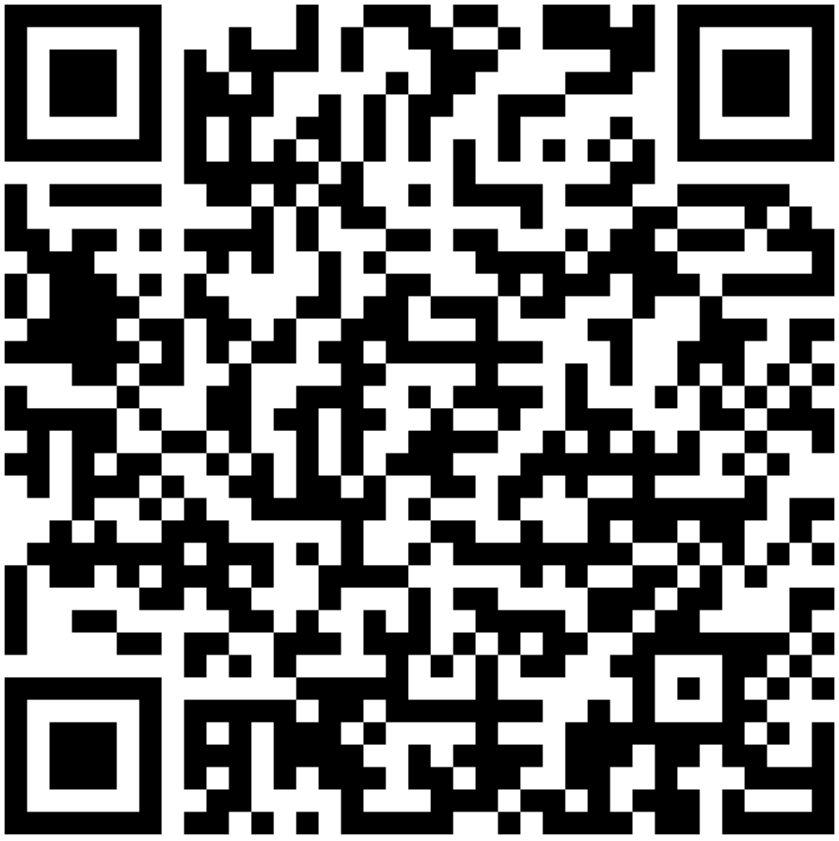
Complete video access point for the EPD-Net training channel.



https://www.youtube.com/@EPD-Net/videos

Appendix 1.3 EPD-Assist GPT

AI-supported academic mentoring, self-evaluation and learning-pathway guidance.

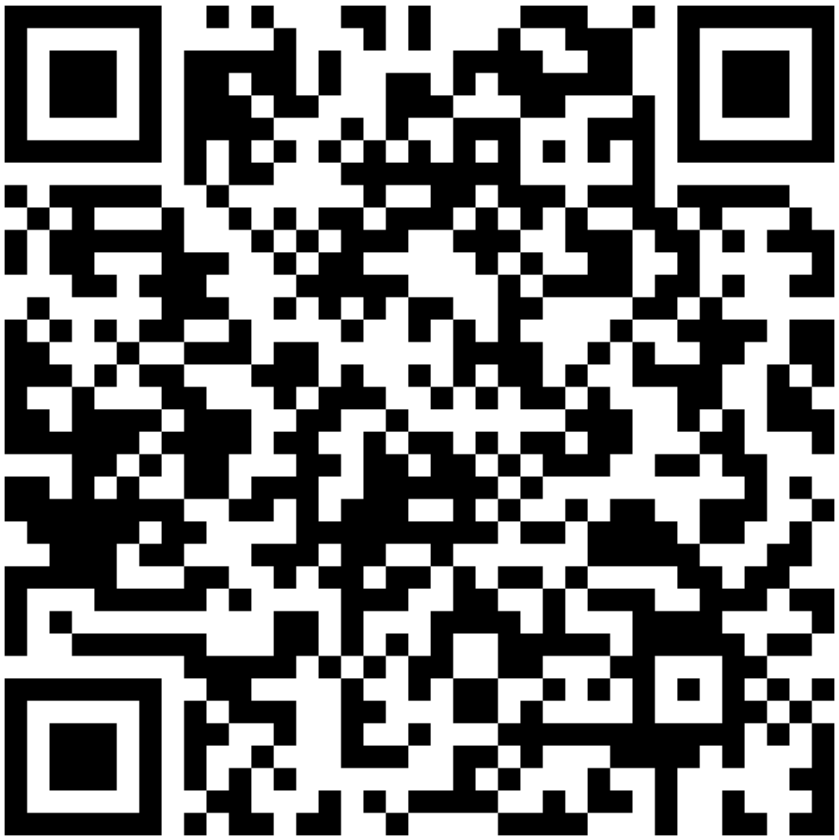


https://chatgpt.com/g/g-69f9df6fd9c48191ab3ccc1bacc8759f-epd-assist

Appendix 1.4 Training Materials Repository 1

Drive1: Epdnet-topics-101-1703

One of the distributed Google Drive repositories for topic-level training materials.

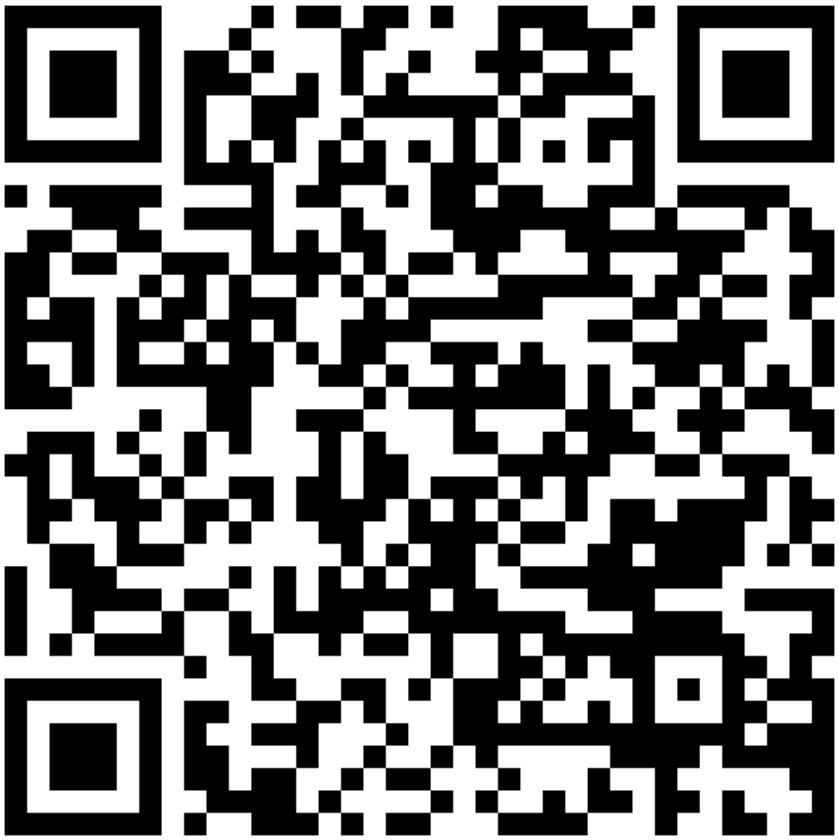


https://drive.google.com/drive/u/1/folders/1g_HuGNRrKOO80pdA3Dihs7o-of8gOJ14

Appendix 1.5 Training Materials Repository 2

Drive2: Epdnet-topics-1801-3503

One of the distributed Google Drive repositories for topic-level training materials.

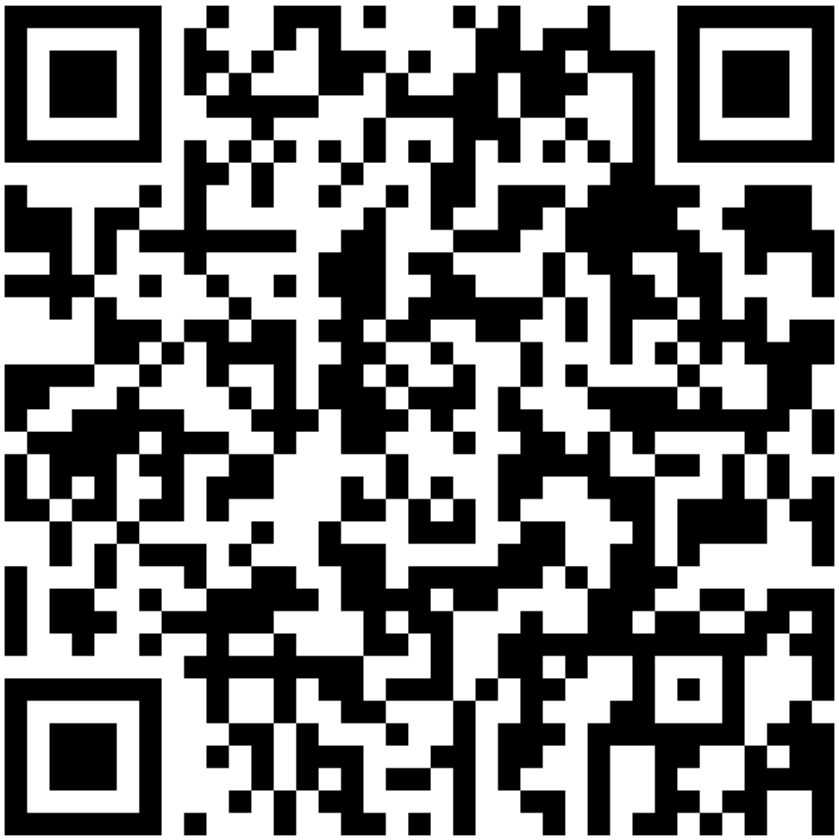


https://drive.google.com/drive/folders/1udsp1IfYDwg1aWGLc2dTZYiC9-66rvlB?usp=sharing

Appendix 1.6 Training Materials Repository 3

Drive3: Epdnet-topics-3601-6403

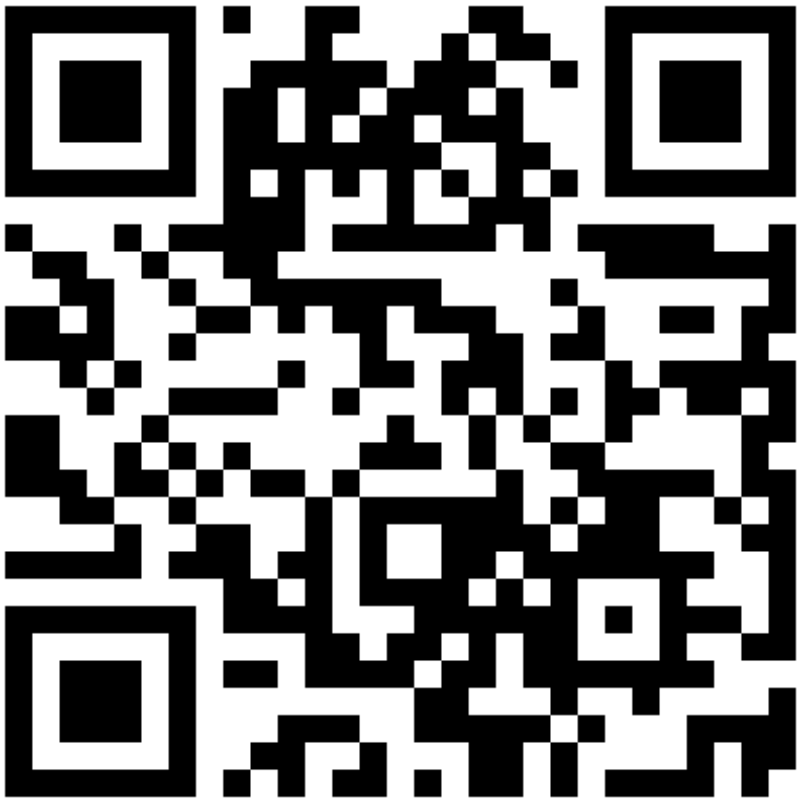
One of the distributed Google Drive repositories for topic-level training materials.



https://drive.google.com/drive/folders/1bgDMfxsNk0D30vGlc4bK0nKokYjfm64m?usp=sharing

Appendix 1.7 Moodle LMS

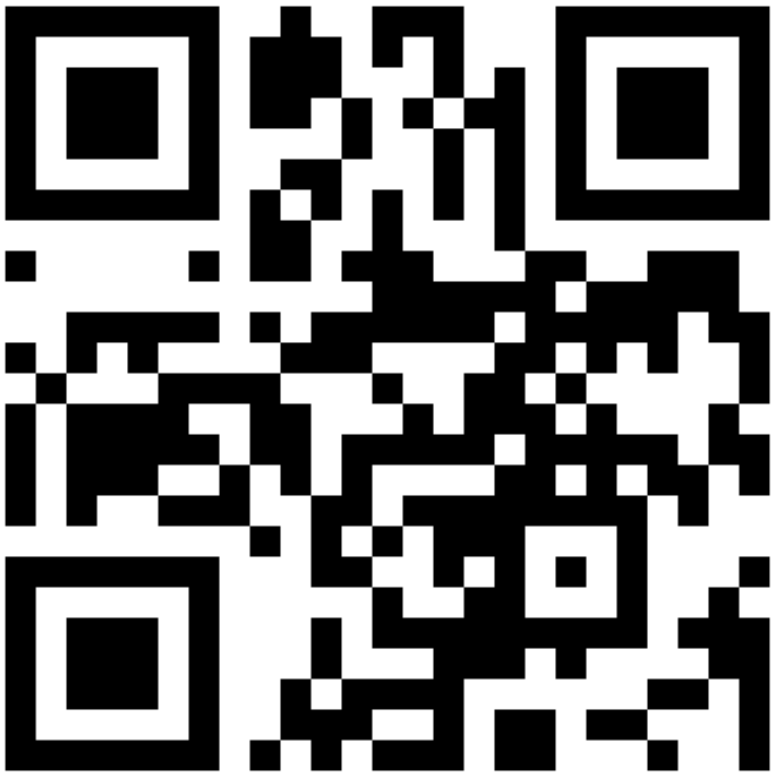
Formal course delivery, progression control, assessment, completion and certificate layer.



https://epd-net.eskisehir.edu.tr

Appendix 1.8 EPD-Net Website

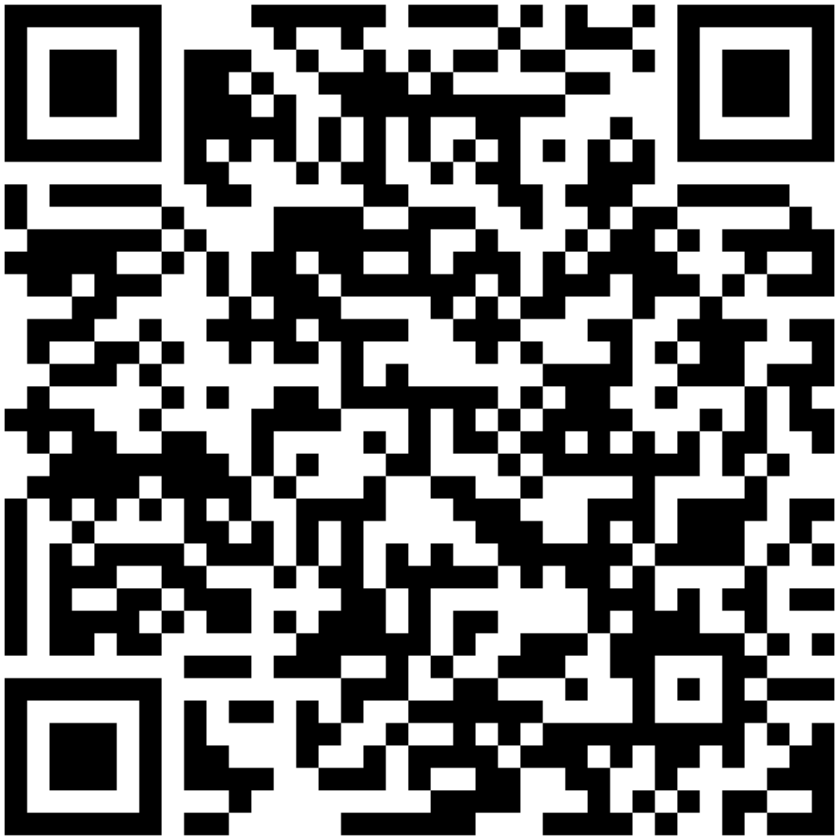
Public project orientation and access point for the learning network.



https://www.epd-net.org

Appendix 1.9 Nature-Based Intelligence GPT

Supplementary public decision-support GPT for nature-based analysis, ecological interpretation, Nature Cities Alliance-related reasoning and nature-based solution exploration. It is not a formal D3.2 self-evaluation, assessment or certification layer.



https://chatgpt.com/g/g-69fb579a2db88191a2cdf00729230c7f-nature-based-intelligence

Appendix 2. Playlist and Repository Index

A2.1 Purpose of the Index

This appendix gives the compact operational index for the D3.2 digital learning assets. It does not reproduce the full file system. That would be counterproductive because the training package contains thousands of files distributed across video, presentation, transcript, assignment, quiz, language and course objects. The correct reporting unit is not the single file. The correct unit is the traceable topic package: a Moodle course object, a YouTube video, a material folder, an open-ended assignment, a quiz bank and a certificate rule linked by the same topic identity. The index therefore records the digital entry points, repository logic, playlist pathways and minimum material structure that allow reviewers, trainers and learners to understand how the system is organised. Its function is evidence control. A user should be able to see where videos are hosted, where the learning materials are stored, how programme pathways are grouped and how these resources connect back to the Moodle completion chain. This appendix should be read together with Appendix 1. Appendix 1 provides QR-based access points. Appendix 2 explains the content index behind those access points. Together they show that D3.2 is not a static annex of files, but a live, indexed and maintainable web-based training module.

A2.1a Learning Access and Completion Workflow

The diagram below summarizes the operational learning route of the EPD-Net Smart Training Module. It is included to make the digital system readable for reviewers, trainers and external users who are not directly involved in the project. The workflow shows where the learner enters the course, which learning object comes next, where the formal Moodle assessment starts, and how completion evidence is produced. It also clarifies the supporting roles of YouTube, Google Drive and EPD-Assist without confusing them with Moodle-based certification.

Programme Playlist or Moodle Entry
↓
Moodle Topic Course
↓
Embedded YouTube Video
↓
PPTX and Transcript
from Google Drive / Moodle material package
↓
Open-Ended Assignment
learner-produced formative evidence
↓
Formal Moodle Quiz
10 random questions, 10 points each, 60/100 pass threshold, three formal attempts
↓
Automatic Topic Certificate
Moodle-generated completion record
↓
Learning Evidence
usable for pathway aggregation and Europass-compatible documentation

The diagram below summarizes the curriculum to platform architecture for the reports;

D3.1 Curriculum Architecture
modules, topics, learning outcomes, EQF levels
↓
Topic-Level Material Package
video, PPTX, transcript, assignment, quiz bank
↓
D3.2 Digital Delivery System
Moodle + YouTube + Google Drive + EPD-Assist
↓
Learner Progression
video → materials → assignment → quiz → certificate
↓
D3.3 Trainer Guidance
delivery protocol, target-group adaptation, quality control

The workflow should be read as a controlled sequence rather than as a loose set of digital links. YouTube provides the video object; Google Drive stores the wider material package; EPD-Assist supports mentoring and formative self-evaluation; Moodle controls assignment submission, formal quiz attempts, pass status and certificate generation. This division of labour is essential. It makes the module accessible without weakening the evidence chain.

EPD-Assist GPT Parallel formative support layer	Supports concept clarification, learning-pathway guidance, assignment scaffolding, formative practice questions and case-study prompts. It is not a formal Moodle quiz attempt, not a grading authority and not a certificate generator.

The textbox shows the certificate-bearing learning sequence from entry to evidence. Programme playlists and YouTube videos support access and orientation. Google Drive and Moodle provide the material layer. EPD-Assist supports formative practice and academic mentoring. Formal assessment, attempt records, pass status and certificate generation remain inside Moodle.

A2.2 Digital Entry Points

The following entry points define the minimum access map for D3.2. Public-facing resources support dissemination and orientation. Moodle remains the formal learning and completion environment. Google Drive repositories preserve the multilingual material packages. EPD-Assist GPT provides academic mentoring and AI-supported self-evaluation. The Nature-Based Intelligence GPT is listed as a complementary public decision-support resource, not as a contractual substitute for EPD-Assist or Moodle.

Table A2.1. Digital Entry Point Index

Layer	Access point	Function in D3.2
YouTube playlists	https://www.youtube.com/@EPD-Net/playlists	Programme-based video pathways and public dissemination of training videos.
YouTube videos	https://www.youtube.com/@EPD-Net/videos	Topic-level video access. Video descriptions include links to related material folders where applicable.
EPD-Assist GPT	https://chatgpt.com/g/g-69f9df6fd9c48191ab3ccc1bacc8759f-epd-assist	Multilingual academic mentoring, learning pathway advice, quiz practice, case-task generation and formative self-evaluation.
GOOGLE DRIVES Drive1: Epdnet-topics-101-1703 Drive2: Epdnet-topics-1801-3503 Drive3: Epdnet-topics-3601-6403		
Google Drive repository 1	https://drive.google.com/drive/u/1/folders/1g_HuGNRrKOO80pdA3Dihs7o-of8gOJ14	Training material repository segment. Used because the full material volume exceeds one free account.
Google Drive repository 2	https://drive.google.com/drive/folders/1udsp1IfYDwg1aWGLc2dTZYiC9-66rvlB?usp=sharing	Training material repository segment. Holds topic packages according to the shared repository logic.
Google Drive repository 3	https://drive.google.com/drive/folders/1bgDMfxsNk0D30vGlc4bK0nKokYjfm64m?usp=sharing	Training material repository segment. Completes the distributed archive of learning objects.
Moodle LMS	https://epd-net.eskisehir.edu.tr	Formal learning environment for 147 topic-level course objects, progression rules, assessment, quiz completion and certificate generation.
EPD-Net website	https://www.epd-net.org	Public project gateway, orientation layer and dissemination anchor.
Nature-Based Intelligence GPT	https://chatgpt.com/g/g-69fb579a2db88191a2cdf00729230c7f-nature-based-intelligence	Complementary public GPT for nature-based analysis, ecological reasoning and decision-support. It supports Nature Cities Alliance-related interpretation and solution exploration, but it is not the formal D3.2 self-evaluation system, assessment layer or certification mechanism.

A2.3 Repository Structure and Material Package Logic

The Google Drive repositories should be read as one distributed archive. Their separation into three accounts is an infrastructure response to storage limits, not a pedagogical separation. A topic package should remain coherent even if its files are stored in one of several repository segments. The learner does not need to know the storage reason. The trainer and reviewer need to know that the topic package can be found, opened and linked to the Moodle course object.

The minimum material package for each topic is defined below. The package may differ slightly where a topic is introductory, case-based or capstone-oriented, yet the common logic should remain stable. The English video script or transcript is the anchor for YouTube subtitle generation and for translation into project languages. The translated PPTX and transcript support local use. The open-ended assignments and quiz banks support Moodle-based self-evaluation and completion.

Table A2.2. Minimum Topic-Level Material Package

Material object	Expected form	Use in learning sequence
Training video	YouTube-hosted video, normally linked or embedded in Moodle.	Initial topic exposition and learner orientation.
English subtitle script or transcript	Text file or document derived from the video script.	Source for accessibility, translation and automatic subtitle support.
PowerPoint presentation	English PPTX and translated PPTX versions in project languages where available.	Structured conceptual and methodological learning material.
Translated transcript	Project-language transcript versions where available.	Multilingual reading support and mandatory preparation for assignment access.
Open-ended assignments	Three assignment prompts per lesson in the self-evaluation sequence.	Evidence of applied understanding before quiz access.
Quiz question bank	Five to twenty questions per lesson in project languages.	Randomised Moodle quiz pool for completion assessment.
Google Drive folder link	Topic-related repository link placed in YouTube description and/or Moodle.	Direct access to the topic package without embedding thousands of files in the report.
Moodle course shell	One course object per topic or topic-level learning unit.	Controls sequence, attempts, pass score and certificate generation.

A2.4 Programme-Based, Micro-Credential and Professional Playlist Index

The YouTube playlist structure is designed as a multi-route navigation layer for the EPD-Net Smart Training Module. It does not replace the curriculum architecture defined in D3.1 and it does not replace Moodle as the controlled learning, assessment and certification environment. Its function is to make the curriculum usable through different entry routes: formal micro-credential courses, vocational and graduate-level learning packages, discipline-specific professional playlists and sector-oriented thematic pathways.

This structure follows the D3.1 curriculum logic. D3.1 defines a modular curriculum catalogue, discipline-specific undergraduate pathways, a vocational education pathway and a graduate programme architecture. It also frames the target audience broadly, including higher education institutions, VET providers, professional chambers, private-sector actors, public-sector organisations, trainers, students, researchers and practitioners. The playlist system translates this broad curriculum architecture into navigable digital routes without fragmenting the underlying topic-code system.

The playlist layer therefore has two connected functions. The first is **course packaging**. Architecture, city and regional planning, landscape architecture and civil engineering are each supported by two micro-credential-oriented course playlists. Each course playlist contains twelve curriculum topics selected from the D3.1 topic catalogue. Vocational education and local government users are also supported through two implementation-oriented course playlists. The graduate-level package is structured as a seven-course playlist set that can support the development of an Ecological Planning and Design for Disaster Management master's programme. Each graduate course is also organised around twelve curriculum topics, with case-study and capstone components completed through Moodle.

The second function is **professional and sectoral navigation**. These playlists are not formal courses in the strict sense. They are curated thematic routes for practitioners who need rapid access to relevant content according to professional task, sectoral responsibility or implementation need. They may serve municipalities, professional chambers, urban planners, landscape architects, architects, civil engineers, GIS specialists, climate-adaptation teams, disaster-risk professionals, infrastructure actors and nature-based solution practitioners. Their value lies in targeted access: the learner does not need to enter through a full academic programme when the immediate need is flood-risk interpretation, heat adaptation, green-blue infrastructure, ecological retrofitting, participatory planning or digital risk mapping.

The operational rule remains unchanged. YouTube provides visibility, orientation and thematic access. Moodle provides structured progression, assignment submission, quiz-based completion, evidence records and certificates. A playlist may guide a learner into a coherent pathway, but certified completion is generated only through Moodle.

Table A2.3. Programme-Based Playlist Index and Micro-Credential Structure

Playlist pathway	Curricular function	Course / credential logic	Topic coverage
City and Regional Planning: Strategic Resilience and Urban Form	Urban density, zoning, participatory processes, strategic resilience, neighbourhood-scale planning and GIS-supported spatial evidence.	One of two city and regional planning micro-credential courses. Each course is structured around twelve selected D3.1 curriculum topics and may be used for undergraduate enrichment, professional upskilling or Moodle-based certification.	301, 302, 303; 1501, 1502, 1503; 1601, 1602, 1603; 1701, 1702, 1703; 2601, 2602, 2603; 2801, 2802, 2803; 2101, 2102, 2103; 2901, 2902, 2903.
Landscape Architecture: Ecosystem-Oriented and Nature-Based Design	Green infrastructure, ecosystem services, biodiversity continuity, watershed logic and climate-responsive public-space design.	One of two landscape architecture micro-credential courses. The playlist translates the D3.1 landscape architecture pathway into a compact video route that can be linked to Moodle activities, assignments and topic-level certificates.	401, 402, 403; 501, 502, 503; 601, 602, 603; 1101, 1102, 1103; 1201, 1202, 1203; 1301, 1302, 1303; 1401, 1402, 1403.
Civil Engineering: Resilient Infrastructure and Technical Solutions	Infrastructure vulnerability, stormwater systems, watershed-scale flood modelling, BIM and emergency shelter infrastructure.	One of two civil engineering micro-credential courses. The playlist supports technical learners who need infrastructure-oriented resilience competences while retaining the ecological planning logic of D3.1.	2001, 2002, 2003; 1901, 1902, 1903; 3101, 3102, 3103; 2501, 2502, 2503; 3401, 3402, 3403.
Architecture: Climate-Responsive Design and Adaptation	Urban heat, passive adaptation, circular design, retrofitting, digital twins, green roofs	One of two architecture micro-credential courses. The playlist converts the architectural pathway into a compact route focused on	701, 702, 703; 901, 902, 903; 1801, 1802, 1803; 2301, 2302, 2303; 3201, 3202, 3203; 3501, 3502, 3503.

Playlist pathway	Curricular function	Course / credential logic	Topic coverage
	and parametric climate-responsive architecture.	climate-responsive design, environmental performance and resilience-oriented adaptation.	
Vocational Education and Local Government: Policy and Implementation Guide	Sustainable city principles, policy literacy, infrastructure equity, participation, climate finance, global commitments and implementation-oriented learning.	One of two VET and local-government-oriented course playlists. The route supports operational learning for municipal staff, vocational learners, professional chambers and implementation actors.	101, 201, 202, 4101; 801, 802, 803; 1001, 1002, 1003; 4201, 4202, 4203; 4401, 4402; 4103, 4403, 4503.
Graduate Programme Package: Ecological Planning and Design for Disaster Management	Graduate-level ecological planning, disaster resilience, GIS and remote sensing, green infrastructure, inclusive risk planning, nature-based solutions and studio-based synthesis.	Seven playlist-based graduate courses can be used as the digital course layer of a master's programme or as advanced modular training. Each course contains twelve curriculum topics, with additional case-study and capstone components handled through Moodle.	Seven course playlists aligned with the D3.1 graduate programme structure: Ecological Principles for Disaster-Resilient Cities; GIS and Remote Sensing for Disaster Planning; Green Infrastructure for Climate Adaptation; Inclusive and Community-Based Risk Planning; Nature-Based Solutions in Risk-Sensitive Planning; Post-Disaster Recovery and Ecological Retrofitting; Urban Form and Morphology under Hazard Constraints / Sustainable Lifestyles and Future Scenarios, depending on institutional programme configuration.

Table A2.4. Professional and Sector-Oriented Playlist Routes

Professional / sector-oriented playlist route	Primary users	Practical learning need	Curriculum connection
Municipal Resilience and Local Government Implementation	Municipal staff, local government units, urban resilience offices, public-sector implementation teams.	Translating ecological planning, climate adaptation, participation, policy instruments and implementation logic into municipal action.	Draws from ecological principles, resilience thinking, participatory governance, EU policy, funding mechanisms, risk-sensitive zoning and urban resilience assessment topics.
Professional Planning Practice and Spatial Risk Governance	Urban planners, regional planners, planning chambers, planning consultants and public planning authorities.	Connecting land-use decisions, density, morphology, zoning, GIS-supported evidence and vulnerability mapping with disaster-resilient spatial strategy.	Draws mainly from climate-risk, urban morphology, density, zoning, GIS, QGIS, scenario planning and strategic resilience modules.

Professional / sector-oriented playlist route	Primary users	Practical learning need	Curriculum connection
Landscape-Based Climate Adaptation and Nature-Based Solutions	Landscape architects, landscape planners, green infrastructure teams, ecological design professionals.	Applying green-blue infrastructure, ecosystem services, biodiversity corridors, watershed logic, planting strategy and climate-responsive public-space design.	Draws from nature-based planning, ecosystem services, green infrastructure, flood mitigation, climate-adaptive planting and biodiversity corridor modules.
Architecture, Retrofitting and Climate-Responsive Built Form	Architects, building-sector professionals, urban design teams, retrofitting specialists.	Connecting climate-responsive form, passive adaptation, circular design, digital twins, green roofs, parametric design and ecological retrofitting.	Draws from urban heat, circular design, retrofitting, digital twins, green roof performance simulation and parametric climate-responsive architecture modules.
Infrastructure Resilience and Engineering Applications	Civil engineers, infrastructure operators, stormwater teams, disaster infrastructure specialists.	Understanding stormwater systems, critical infrastructure vulnerability, flood modelling, BIM-based environmental impact and emergency shelter infrastructure.	Draws from stormwater infrastructure, infrastructure vulnerability, flood-risk modelling, BIM integration and emergency shelter design modules.
GIS, Remote Sensing and AI-Supported Risk Mapping	GIS specialists, spatial analysts, technical municipal units, researchers and data-oriented practitioners.	Using geospatial evidence, remote sensing, AI-supported ecological risk mapping, QGIS and digital twins for risk-sensitive planning and decision support.	Draws from GIS, remote sensing, digital twin, AI risk mapping, QGIS vulnerability mapping and resilience assessment topics.
Disaster Recovery, Shelter and Post-Disaster Ecological Retrofitting	Disaster-management actors, humanitarian shelter professionals, municipal recovery teams, planners and designers working in post-disaster contexts.	Linking recovery planning, emergency shelter, ecological retrofitting, social vulnerability, green-blue infrastructure and long-term resilience.	Draws from emergency shelter design, post-disaster recovery, retrofitting, participatory governance, infrastructure resilience and ecological project simulation topics.
Professional Upskilling for Chambers and Continuing Education	Professional chambers, continuing education providers, sectoral associations and professional trainers.	Offering short, targeted learning routes that can be connected to Moodle certificates or used in workshops, seminars and professional development events.	Uses selected topics from the full D3.1 catalogue according to professional profile, EQF level and training duration.

These professional and sector-oriented playlists should be understood as adaptive navigation routes rather than separate curricula. Their purpose is to make the same D3.1 curriculum usable for professional audiences whose learning needs are defined by task, sector and implementation pressure. A municipal officer may need policy, funding and implementation content before advanced design theory. A landscape architect may need a nature-based design route. A GIS specialist may need a technical risk-mapping route. A chamber may need

a compact continuing-education package. The playlist system allows these users to access the curriculum without weakening the topic-code discipline.

This dual playlist model is stronger than a single programme index. It preserves formal course packaging for micro-credentials and graduate education, while also keeping the professional dissemination logic of EPD-Net visible. The same topic can appear in a course playlist and in a professional playlist. This is not duplication. It is controlled curricular recontextualisation. The topic identity remains stable; the pathway changes the professional emphasis.

For D3.2 reporting, the playlist system should therefore be read as a bridge between D3.1 curriculum design, Moodle-based certification and professional uptake. It makes the curriculum navigable for students, usable for trainers, adaptable for institutions and directly relevant for practitioners who need ecological planning and design competences in real decision environments.

Programme-based playlists translate the curriculum into recognisable learning pathways. Their role is not to certify learning. Certification remains inside Moodle. The playlists help users locate coherent video sequences for specific educational and professional profiles, especially where learners approach the module through their discipline rather than through the full master catalogue. The current playlist structure includes five core programme pathways. Each pathway groups topic codes around a disciplinary or implementation logic: city and regional planning, landscape architecture, civil engineering, architecture, and VET/local government. This mirrors the D3.1 curriculum logic while making video access easier for users who need a practical entry route.

Table A2.5. Programme-Based Playlist Index

Playlist pathway	Curricular focus	Topic coverage
City and Regional Planning: Strategic Resilience and Urban Form	Urban density, zoning, participatory processes, strategic resilience, neighbourhood-scale planning and GIS-supported spatial evidence.	301, 302, 303; 1501, 1502, 1503; 1601, 1602, 1603; 1701, 1702, 1703; 2601, 2602, 2603; 2801, 2802, 2803; 2101, 2102, 2103; 2901, 2902, 2903.
Landscape Architecture: Ecosystem-Oriented and Nature-Based Design	Green infrastructure, ecosystem services, biodiversity continuity, watershed logic and climate-responsive public-space design.	401, 402, 403; 501, 502, 503; 601, 602, 603; 1101, 1102, 1103; 1201, 1202, 1203; 1301, 1302, 1303; 1401, 1402, 1403.
Civil Engineering: Resilient Infrastructure and Technical Solutions	Infrastructure vulnerability, stormwater systems, watershed-scale flood modelling, BIM and emergency shelter infrastructure.	2001, 2002, 2003; 1901, 1902, 1903; 3101, 3102, 3103; 2501, 2502, 2503; 3401, 3402, 3403.
Architecture: Climate-Responsive Design and Adaptation	Urban heat, passive adaptation, circular design, retrofitting, digital twins, green roofs and parametric climate-responsive architecture.	701, 702, 703; 901, 902, 903; 1801, 1802, 1803; 2301, 2302, 2303; 3201, 3202, 3203; 3501, 3502, 3503.
Vocational Education and Local Government: Policy and Implementation Guide	Sustainable city principles, policy literacy, infrastructure equity, participation, climate finance, global commitments and implementation-oriented learning.	101, 201, 202, 4101; 801, 802, 803; 1001, 1002, 1003; 4201, 4202, 4203; 4401, 4402; 4103, 4403, 4503.

Table A2.6. Course-Based Playlist Index

Playlist pathway	Curricular focus	Topic coverage
Playlist for Undergraduate Architecture — Lecture 1: Ecological Systems in Architectural Design	Ecological systems, ecosystem services, nature-based solutions, biodiversity, climate adaptation and ecological thinking in undergraduate architectural design education.	2001, 202, 201, 401, 2102, 1801, 2302, 1101, 2502, 3201, 1902, 201, 1802, 2501.
Playlist for Undergraduate Architecture — Lecture 2: Climate-Responsive Architecture and Urban Form	Climate-responsive architectural design, urban form, passive strategies, green roofs, circular systems, GIS/AI-supported analysis, digital twins and resilient adaptation at the undergraduate level.	501, 901, 3002, 3202, 3102, 502, 1202, 2402, 3502, 302, 2801, 1201, 701, 102.
Playlist for Undergraduate Planning Schools — Lecture 1: Disaster Resilience in Urban Planning	Disaster risk, urban resilience, vulnerability and adaptive capacity, neighbourhood-scale planning, spatial evidence and GIS-supported planning strategies for undergraduate planning education.	3201, 2101, 1601, 1201, 601, 2701, 1701, 2202, 1101, 3101, 1002, 3202, 1102, 1301.
Playlist for Undergraduate Planning Schools — Lecture 2: Ecological Approaches to Urban Strategy	Ecological urban strategy, green infrastructure, nature-based solutions, land-use planning, strategic resilience, participatory processes and climate adaptation in undergraduate planning education.	2502, 1702, 3502, 1402, 2902, 902, 2601, 301, 1902, 3302, 101, 1602, 1801, 2201.
Playlist for Undergraduate Civil Engineering — Lecture 1: Infrastructure Planning for Climate Adaptation	Climate-adaptive infrastructure, stormwater and flood systems, resilient transportation and utility planning, watershed logic, BIM/GIS-supported assessment and implementation strategies for undergraduate civil engineering.	2502, 1801, 2001, 501, 2601, 2101, 3301, 2002, 1001, 502, 102, 3302, 3502, 3402.
Playlist for Undergraduate Civil Engineering — Lecture 2: Engineering for Urban Resilience	Engineering approaches to urban resilience, infrastructure vulnerability, risk assessment, emergency shelter, technical solutions, digital modelling and resilience scenarios for undergraduate civil engineering.	3101, 2901, 1501, 302, 1201, 2302, 2401, 3501, 1202, 3202, 3401, 2802, 3001, 1502.
Playlist for Undergraduate Landscape Architecture — Lecture 1: Ecological Fundamentals for Resilient Cities	Ecological fundamentals, biodiversity continuity, ecosystem services, watershed systems, green networks and nature-based solutions for resilient city landscapes at the undergraduate level.	3302, 1401, 3401, 2801, 1402, 3101, 2501, 2502, 1901, 1602, 201, 2002, 2702, 1802.
Playlist for Undergraduate Landscape Architecture — Lecture 2: Climate and Design	Climate-sensitive landscape design, urban heat mitigation, water-sensitive design, public-space adaptation, green infrastructure and resilient climate-responsive design strategies for undergraduate landscape architecture.	2201, 3201, 3402, 2001, 3202, 1601, 101, 1702, 102, 2602, 1701, 601, 602, 801.
Playlist for VETs — Lecture 1: Sustainable Development and Environmental Planning	Sustainable development, environmental planning, basic ecological literacy, resource management, infrastructure equity and implementation-oriented learning for vocational education and training.	4101, 101, 201, 202, 402, 501, 502, 2501, 2502, 1002, 2601, 2602, 4501, 3602.
Playlist for VETs — Lecture 2: Global Climate Policies and International Agreements	Global climate policy, international agreements, governance frameworks, climate finance, global commitments and practical policy literacy for vocational education and training.	4201, 4203, 4202, 4301, 4501, 4303, 4201, 4402, 4102, 4103, 4502, 4403, 4503, 4503.
Playlist for Graduate Programme — Lecture 1: Ecological Principles for Disaster-Resilient Cities	Ecological principles, disaster-resilient urban systems, environmental planning foundations and nature-based approaches for graduate-level resilience education.	000, 101, 102, 201, 202, 301, 302, 401, 402, 501, 502, CS1, CS2, CAP.
Playlist for Graduate Programme — Lecture 2: GIS and Remote Sensing for Disaster Planning	GIS, remote sensing, spatial data interpretation, risk mapping and evidence-based disaster planning methods for graduate-level urban resilience studies.	000, 1501, 1502, 1601, 1602, 1701, 1702, 1801, 1802, 1901, 1902, CS1, CS2, CAP.
Playlist for Graduate Programme — Lecture 3: Green Infrastructure for Climate Adaptation	Green infrastructure, climate adaptation, water-sensitive planning, ecological networks and nature-based design strategies for graduate-level spatial and environmental planning.	000, 2201, 2202, 2301, 2302, 2401, 2402, 2501, 2502, 2601, 2602, CS1, CS2, CAP.
Playlist for Graduate Programme — Lecture 4: Inclusive and Community-Based Risk Planning	Inclusive planning, community-based risk reduction, participatory governance, social vulnerability and resilient implementation pathways for graduate-level planning education.	000, 2901, 2902, 3001, 3002, 3101, 3102, 3201, 3202, 3301, 3302, CS1, CS2, CAP.

Playlist pathway	Curricular focus	Topic coverage
Playlist for Graduate Programme — Lecture 5: Nature-Based Solutions in Risk-Sensitive Planning	Nature-based solutions, ecosystem services, risk-sensitive planning, climate adaptation, spatial interventions and scenario-based strategies for graduate-level resilience education.	000, 801, 802, 901, 902, 1001, 1002, 1101, 1102, 1201, 1202, CS1, CS2, CAP.

A2.5 Repository-to-Moodle Linkage

The index is valid only if the same topic identity is preserved across platforms. A Moodle course shell points to the video and material package for the same topic. A YouTube description will not send the learner to an unrelated repository folder. A Drive folder contain ambiguous file names that conceal the topic. The operational standard is simple: language first, topic code second, material type third, version last.

The Moodle sequence gives the linkage its assessment value. The learner enters the topic course, watches the embedded YouTube video, accesses the PPTX and transcript, completes the open-ended assignment, unlocks the quiz, attempts a randomised ten-question test, reaches the required threshold and receives the certificate. Google Drive supports this sequence by storing the material objects. YouTube supports it by making the video visible. EPD-Assist supports it by mentoring the learner. Moodle validates it.

Table A2.4. Repository-to-Moodle Linkage Fields

Field	Required content	Reason for inclusion
Topic code	Stable identifier used across D3.1, Moodle, YouTube, Drive and EPD-Assist.	Prevents content drift and makes the system auditable.
Moodle course link	Course URL or internal course reference.	Identifies the formal learning and certification location.
YouTube video link	Video URL or playlist position.	Identifies the video object embedded or referenced in Moodle.
Drive folder link	Topic-level material package folder.	Connects learners to PPTX, transcripts, assignments and quiz resources.
Language versions	Available project-language versions of PPTX, transcript, assignment and quiz.	Shows multilingual implementation rather than only English delivery.
Assignment rule	Open-ended assignment completion required before quiz access.	Links practice, reflection and evidence before test completion.
Quiz rule	Ten random questions per attempt, pass threshold and attempt limit.	Defines the formal self-evaluation and completion standard.
Certificate rule	Automatic certificate generated after successful completion.	Creates learner-level proof of completion.

A2.6 Index Maintenance Protocol

The index must be treated as a living control document. It should not become a decorative appendix that is correct only at the date of submission. Whenever a video is reuploaded, a playlist is reorganised, a Google Drive folder is moved, a Moodle course is duplicated, a quiz bank is revised or a translated file

is replaced, the index must be updated. The minimum rule is simultaneous updating across Moodle, YouTube description, Drive folder and master index.

The system should avoid silent corrections. If a quiz bank changes, the version should be recorded. If a translation is corrected, the old and new file names should make the replacement intelligible. If a video description receives a new Drive link, the corresponding Moodle course should be checked in the same maintenance cycle. This is not bureaucratic excess. It is the only way to keep a distributed digital system defensible.

A short periodic review is sufficient. Before external reporting, pilot delivery or public dissemination, the responsible team should test the core access points, verify playlist visibility, confirm Drive permissions, check Moodle progression rules and confirm that EPD-Assist still directs learners toward validated resources. This review should be retained as a dated implementation note.

Table A2.5. Minimum Maintenance Checklist

Check	Minimum control
Playlist visibility	Open the programme playlists and confirm that the intended video pathway is accessible.
Video descriptions	Confirm that descriptions contain the correct material links where topic-level Drive folders are used.
Drive permissions	Open repository folders from an authorised non-owner account and confirm access.
Moodle progression	Test whether video, PPTX, transcript, assignment and quiz restrictions operate as intended.
Quiz randomisation	Confirm random question selection and answer-option randomisation where configured.
Certificate generation	Verify that successful completion generates the topic certificate.
EPD-Assist alignment	Check that mentoring and self-evaluation responses remain formative and topic-aligned.

A2.7 Appendix Implementation Statement

Appendix 2 gives the repository and playlist index needed for D3.2 auditability. It deliberately avoids reproducing thousands of files because file volume is not evidence of implementation quality. The evidence lies in controlled linkage: topic code, video, material package, Moodle course, assignment, quiz, certificate and support layer.

The practical standard is strict. Every playlist should guide learners to a meaningful pathway. Every repository folder should contain recognisable topic materials. Every Moodle course should enforce the learning sequence. Every self-evaluation action should remain traceable to a topic and a learning object. When these conditions hold, D3.2 can be defended as a functioning smart training module rather than a dispersed collection of digital assets.

Appendix 3

WP3 Performance Indicator Completion Evidence and Compliance Statement

Deliverable D3.2 - Smart Training Module, including an AI-Based Self-Evaluation System and LMS

Completion statement: The WP3 performance indicators assigned to the Smart Training Module and its training-materials system have been met. KPI1, KPI4, PI3 and PI4 are closed at WP3 level, subject to routine link maintenance, Moodle course-level enrichment by assigned course responsibles, and partner-level content review of the training materials during pilot implementation.

A3.1 Purpose of the Appendix

This appendix documents the completion status of the WP3 performance indicators attached to the EPD-Net Smart Training Module. It is added to D3.2 as a compact evidence and compliance layer. Its function is not to repeat the full digital architecture described in the main report. Its function is narrower: to show how the relevant KPI and PI targets have been addressed, which evidence demonstrates completion, and which maintenance actions should continue after the indicator is closed.

The appendix treats completion as an auditable condition, not as a verbal claim. A performance indicator is considered met when the target value is achieved, the responsible WP3 output exists, the evidence route is traceable, and the remaining work consists of routine maintenance, quality enrichment or pilot-based refinement rather than core deliverable production.

A3.2 Indicator Set Covered by this Appendix

The indicator set covers four WP3 indicators: KPI1 on Smart Training Module completion, KPI4 on the number of Smart Training Module versions, PI3 on training-materials completion, and PI4 on the rate of Smart Training Module content containing or developed through deep-tech. The due date of the indicator set is M15 - May 2026, aligned with the WP3 deliverable cycle.

Indicator	WP / Objective	Target	Responsible partner	Completion decision
KPI1. Smart training module completion rate	Obj. 1 / WP3	100%	IKU / BS	Met
KPI4. Number of smart training module versions developed	Obj. 1 / WP3	3 versions	IKU / BS	Met
PI3. Completion rate of training materials	WP3	100%	IKU	Met
PI4. Rate of smart training module containing or developed through deep-tech	Obj. 4 / WP3	50%	IKU	Met and exceeded at system level

A3.3 Completion Evidence Matrix

The following matrix provides the reporting logic for closing the WP3 indicators. It distinguishes target fulfilment from maintenance. This distinction is important. Moodle enrichment, partner review of materials and pilot feedback remain necessary for quality improvement, but they do not prevent the WP3 indicator set from being recorded as achieved when the core module, material base, version chain and deep-tech layer are already in place.

Indicator	Target	Evidence of completion	Verification logic	Residual action
KPI1	100% completion rate	The Smart Training Module is structured through Moodle-based topic courses, YouTube video access, Google Drive repositories, EPD-Assist GPT, QR/link entry points, assignments, quizzes and topic-level certificate logic.	A topic can be traced from curriculum identity to Moodle course, video, PPTX/transcript, open-ended assignment, quiz and certificate record.	Continue Moodle link checks, course-level enrichment and pilot-based refinement.
KPI4	3 module versions	V1 training-material template structure; V2 completed training-material package; V3 multilingual AI-aided Moodle module including videos and AI-supported guidance.	The version chain shows a progression from content template to completed materials and then to the operational multilingual digital module.	Maintain a short version log when major Moodle, repository or AI-support changes are made.
PI3	100% training-material completion	The WP3 material package contains topic-level video, PPTX, transcript, open-ended assignment, quiz bank, language versions, Drive repository placement and Moodle placement.	Completion is assessed at topic-material package level rather than by printing thousands of files in the report.	Content owners and assigned course responsibles should continue checking accuracy, language consistency and pedagogical enrichment.
PI4	50% deep-tech rate	The module is deep-tech-enabled through AI-supported mentoring and self-evaluation, LMS-based adaptive progression, quiz randomisation, multilingual digital access, video-transcript integration and NBI decision-support surface where relevant.	At system level, the 147 topic-level Moodle course objects operate within a digitally enabled, AI-supported learning environment; the 50% threshold is therefore met and exceeded.	Keep the definition of deep-tech-enabled content stable and document future AI or LMS changes in the version log.

A3.4 KPI1 - Smart Training Module Completion Rate

KPI1 is considered met because the Smart Training Module has been built as an operational digital learning system rather than as a disconnected file archive. The system contains the core elements required for module completion: Moodle-based course shells, video-supported learning objects, multilingual learning materials, open-ended assignments, quiz-based self-evaluation, topic-level completion rules, certificate generation logic, AI-supported mentoring and reviewable access routes.

The completion rate should be interpreted through traceability. The relevant question is not whether every derivative file is printed inside D3.2. The relevant question is whether a reviewer, trainer or learner can follow a topic from the curriculum identity to the Moodle course, from the course to the embedded video, from the video to the supporting material package, from the material package to the open-ended assignment, from the assignment to the quiz, and from quiz success to a Moodle completion and certificate record.

On this basis, KPI1 is closed as 100% achieved at system-completion level. Remaining Moodle integration work, link checking, course-page enrichment and pilot feedback are treated as implementation maintenance and quality refinement, not as evidence that the module is incomplete.

A3.5 KPI4 - Number of Smart Training Module Versions Developed

KPI4 is considered met because the Smart Training Module has passed through three identifiable development versions. Each version represents a different maturity level of the WP3 output: template structure, completed material base and operational multilingual AI-aided module.

Version	Development stage	Defining evidence	Completion status
V1	Training-material template structure	Template logic and topic-material structure were prepared and sent to training-material developers as the initial production frame.	Completed
V2	Completed training materials	Topic-level learning materials were prepared as video/PPTX/transcript/assignment/quiz packages and organised through repository logic.	Completed
V3	Multilingual AI-aided Smart Training Module	The material base was integrated with Moodle, YouTube, Google Drive, EPD-Assist GPT, QR/link access and AI-supported self-evaluation logic.	Completed

This version chain satisfies the target value of three versions. Future updates should continue to use version numbering only when there is a material change in the module structure, Moodle configuration, repository organisation, AI-support layer, language coverage or assessment rule. Routine link checks should be recorded as maintenance notes, not as new versions.

A3.6 PI3 - Completion Rate of Training Materials

PI3 is considered met because the training-material system has reached 100% completion at the topic-package level. The material package is not defined as a single file. It is defined as a structured set of learning objects attached to a topic-level course: lesson video, PowerPoint presentation, transcript, open-ended assignment, quiz bank, language versions, repository placement and Moodle placement.

This definition is necessary because WP3 contains thousands of derivative files. A file-by-file reproduction inside D3.2 would make the report unusable and would still not demonstrate pedagogical completion. The stronger evidence is topic-package integrity: each topic should have the necessary learning objects, the objects should be reachable through the repository and Moodle route, and the materials should remain aligned with the curriculum topic identity.

Material component	Completion criterion	Completion status
Lesson video	Video exists and is connected to the relevant topic route through YouTube and/or Moodle.	Completed
PowerPoint presentation	PPTX learning material exists as part of the topic-level package.	Completed
Transcript	Transcript supports study, translation and subtitle logic.	Completed
Open-ended assignment	Assignment object exists for topic-level learner production and self-evaluation gateway.	Completed
Quiz bank	Quiz questions support the Moodle self-evaluation and completion logic.	Completed
Language versions	Project-language material layer is organised through translated materials and Moodle/repository access.	Completed
Repository placement	Material package is stored in the distributed Google Drive repository structure.	Completed
Moodle placement	Topic-level course objects support formal progression and completion evidence.	Completed

The indicator is therefore closed as 100% achieved. The next quality step is not material production but material verification. Colleagues who prepared the training materials, assigned course responsibles in Moodle and pilot implementation teams should continue checking accuracy, language consistency, link stability and pedagogical richness during the review and pilot phase.

A3.7 PI4 - Rate of Smart Training Module Containing or Developed through Deep-Tech

PI4 is considered met and exceeded. The target value is 50%. The module is not merely hosted digitally; it contains a deep-tech-enabled learning layer. This layer includes EPD-Assist GPT for multilingual academic mentoring and formative self-evaluation, AI-supported generation of additional quiz questions, case-study prompts and assignment variants, Moodle-based conditional progression, randomised quiz delivery, video-transcript-supported multilingual learning, and the complementary Nature-Based Intelligence GPT for applied nature-based reasoning and decision-support where relevant.

For reporting consistency, deep-tech-enabled content is defined at system level. A topic-level course is counted as deep-tech-enabled when it is part of the LMS-based Smart Training Module and can be supported by AI-aided mentoring, self-evaluation logic, digital progression, randomised quiz mechanisms and multilingual digital access. Under this definition, the threshold is not only met; it is structurally surpassed because the 147 topic-level course objects operate inside the same AI-supported and LMS-controlled digital learning environment.

Deep-tech element	Function in D3.2	Indicator relevance
EPD-Assist GPT	Multilingual academic mentoring, concept clarification, pathway guidance and formative self-evaluation.	Directly supports AI-aided Smart Training Module logic.
AI-generated formative practice	Additional quiz questions, case-study prompts and assignment variants can be produced for practice and mentoring.	Supports scalable self-evaluation without exhausting formal quiz banks.
Moodle LMS progression	Controls sequence, gates assignment/quiz access, records completion and generates certificates.	Provides adaptive digital learning infrastructure and auditable evidence.
Randomised quiz system	Generates attempt-level variation in questions and answer order.	Strengthens digital self-evaluation and reduces mechanical repetition.
Multilingual video-transcript pipeline	Links video, transcript, translation and subtitle-supported access.	Extends digital accessibility and learning reach.
Nature-Based Intelligence GPT	Supports nature-based reasoning, case interpretation and decision-oriented exploration.	Complements EPD-Assist as an applied intelligence surface.

The conservative completion statement is therefore: PI4 target of 50% is achieved and exceeded at system level. The module should continue documenting AI and LMS-related changes through the version log so that the deep-tech claim remains auditable during pilot implementation and later reuse.

A3.8 Residual Quality Controls after Indicator Closure

Closing the indicators does not mean freezing the system. It means the core WP3 production targets have been met and the remaining work is quality assurance, enrichment and maintenance. Three residual controls should continue during the pilot phase: Moodle readiness checks, material-owner review and pilot feedback recording.

Control area	Responsible actors	Purpose	Output
Moodle readiness	Başarsoft, PMO, LMS administrators and course responsibles	Check course visibility, links, assignment gates, quiz rules, certificate triggers and language placement.	Course-readiness note or checklist.
Material-owner review	Colleagues who prepared the training materials and relevant partner institutions	Verify content accuracy, terminology, topic-code consistency, language versions and assessment alignment.	Material quality note or corrected package.
Pilot feedback	Pilot Implementation team, Başarsoft, PMO and trainers	Record learner experience, technical issues, weak instructions, quiz problems and improvement needs.	Pilot implementation log and corrective action list.

A3.9 Final WP3 Indicator Completion Declaration

Based on the evidence structure documented in D3.2 and summarised in this appendix, the WP3 performance indicators KPI1, KPI4, PI3 and PI4 are recorded as achieved. The Smart Training Module has reached operational completion, three development versions have been established, the topic-level training-material package has been completed, and the deep-tech threshold has been met and exceeded through the AI-supported, LMS-controlled and multilingual digital learning architecture.

The remaining actions concern quality refinement rather than target fulfilment. Moodle integration will continue to be checked and enriched; training materials should continue to be reviewed by their authors and course responsibles; pilot implementation feedback should be used to improve usability, assessment clarity and course-level guidance. These actions strengthen the deliverable after completion. They do not alter the completion decision for the WP3 indicator set.