INTEGRATED GUIDE FOR IPEERS

D. Serikbayev EAST KAZAKHSTAN TECHNICAL UNIVERSITY

EDUFUSION NSG

Co-funded by the European Union

Edu-Fusion Network for Sustainable Growth
ERASMUS-EDU-2024-CBHE-STRAND-3
101179805

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Task 3.2 “Train the trainer workshop”

16-19 February, 2026

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East Kazakhstan
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Ust-Kamenogorsk, Kazakhstan
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Integrated Guide for iPEERs

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Table of content

Introduction and Program Overview

The Edu-Fusion NSG "Train the Trainer" programme, implemented under Work Package 3 (**Task 3.2 – Train the Trainer Workshop)** of the *Edu-Fusion Network for Sustainable Growth* project (ID: 101179805), constitutes a comprehensive professional development framework for engineering faculty. It prepares academic staff from partner universities to deliver the newly developed Professional Development Programmes (PDPs) through innovative, interactive, and learner-centred methodologies.

The initiative seeks to modernise higher engineering education in Kazakhstan and partner countries by strengthening pedagogical, digital, research, leadership, and innovation competencies, while reinforcing institutional capacity for high-quality, practice-oriented training delivery.

[1]**Key Mission:** Creating an ecosystem that ensures close links between industry and academia, training and certification of educators, and providing online courses that meet labor market needs.

Total Workload: 72 academic hours

Contact Hours: 32 academic hours (4-day intensive training)

Independent Work: 40 academic hours (structured independent learning)

Delivery Format: Blended learning with predominant face-to-face interaction, supplemented by digital technologies and practice-oriented assignments.

Target Audience: Faculty members of engineering faculties and departments in Kazakhstan higher education institutions

[1] *This program is developed in full alignment with EduFusion NSG Deliverables* D3.1 – PDPs Curriculum, Syllabus and Credits *and* D3.2 – Training Materials and Thematic Clusters*, ensuring comprehensive coverage of all 20 PDPs, transparent credit distribution, and methodological consistency across modules.*

Program Structure and Architecture

Alignment with D3.2 Thematic Clusters

The program fully aligns with the cluster logic of Deliverable D3.2 of the EduFusion NSG project. All 10 thematic clusters and 20 Professional Development Programs (PDPs) are integrated into a four-module structure:

Module	Thematic Clusters	Contact Hours	Independent Work	Total
Module 1: Engineering Pedagogy & Learner Engagement	Innovative pedagogy; Psychopedagogy & communication	8	8	16
Module 2: Digital, Practice-Based & Systems Learning	Innovative pedagogy; Problem solving & systems thinking; Data & information literacy & critical thinking	8	10	18
Module 3: Competence-Based Design, Assessment & Sustainability	Assessment for learning; Sustainability	8	12	20
Module 4: Leadership, Innovation & Professional Responsibility	Leadership & teamwork; R&D&I & entrepreneurship; Global ecosystem & stakeholders; Professional ethics & social responsibility	8	10	18

Coverage of Professional Development Programs (PDPs)

The program ensures 100% coverage of all 20 PDPs:

Module 1 (4 PDPs):

- *Innovations in Engineering Pedagogy (KAZNRTU+UVIGO)*
- *Effective Interaction with Learners (KAZNARU+UVIGO)*
- *Pedagogical Psychology & Communication (KarU)*
- *Enhancement of Learning Interactivity (KarU+IPP)*

Module 2 (5 PDPs):

- *Digital Education / X-Learning Design (KAZNARU+IPP)*
- *Experimental & Practice-Based Learning Leadership (KAZNRTU+IPP)*
- *System Thinking & Analysis (KarU)*
- *Data & Information Literacy (KATRU)*
- *Critical Thinking & Questioning Attitude (EKTU)*

Module 3 (4 PDPs):

- *Course Design for Competence Formation (EKTU)*
- *Learning Outcomes Assessment (KATRU)*
- *Sustainable-Development Integration (KATRU)*
- *Cross-Disciplinary Integration (KAZNRTU)*

Module 4 (7 PDPs):

- *Leadership and Collaborative Teamwork (KAZNARU)*
- *Engineering Innovation & Entrepreneurship Leadership (KarU)*
- *Interaction with Stakeholders (EKTU)*
- *Global & Intercultural Competence (KATRU)*
- *Professional Ethics & Social Responsibility (KAZNU)*
- *Lifelong Learning & Self-Regulation (KAZNU)*
- *Time Management (KAZNU)*

Modular Learning Organization

Module 1: Engineering Pedagogy & Learner Engagement
Daily Focus: Pedagogical foundations, learner engagement, communication, and interactive teaching methods.

- Learning Outcomes:
  - Explain principles of engineering pedagogy and outcomes-based education
  - Apply learner-centered communication strategies
  - Use pedagogical psychology to increase motivation
  - Design interactive learning activities

- Key Competencies:
  - Understanding the scientific system of engineering-pedagogical knowledge
  - Mastery of methodology for searching new ideas and theories for teaching engineering disciplines
  - Ability for integral interdisciplinary thinking in education

Module 2: Digital, Practice-Based & Systems Learning
Daily Focus: Digital learning, practice-based education, systems thinking, and analytical skills.

- Learning Outcomes:
  - Design digital or blended learning components
  - Plan practice-based and laboratory learning
  - Apply systems thinking to course design
  - Develop data literacy and critical thinking

- Technological Components:
  - Integration of ICT, AI, IoT, AR/VR, and gamification
  - Use of LMS, classroom response systems, XR/VR tools
- Application of AI and LLM, project management platforms

Module 3: Competence-Based Design, Assessment & Sustainability
Daily Focus: Competence-based education, assessment, sustainability, and interdisciplinarity.

- Learning Outcomes:
  - Design competence-oriented courses
  - Develop assessment criteria and rubrics
  - Integrate sustainability and SDGs
  - Create interdisciplinary links

- Practical Component: Includes visits to employers/industry partners to ensure connection between theory and practice and understanding of labor market needs.

Module 4: Leadership, Innovation & Professional Responsibility
Daily Focus: Leadership, innovation, ethics, stakeholder engagement, and professional development.

- Learning Outcomes:
  - Demonstrate leadership and teamwork skills
  - Apply innovation and entrepreneurial thinking
  - Engage effectively with stakeholders
  - Plan lifelong learning and self-regulation

Methodological Formats (30-minute blocks)
Each PDP is implemented through specially designed 30-minute formats:

Format Type	PDP Examples	Assessment Methods
Mini-lecture + guided reflection	Innovations in Engineering Pedagogy	Reflection note
Round-table discussion	Effective Interaction with Learners	Participation summary
Case discussion	Pedagogical Psychology & Communication	Reflective response
Workshop	Enhancement of Learning Interactivity	Designed activity outline
Demo + discussion	Digital Education	Digital activity concept
Case-based learning	Experimental Learning	Practice task
Group system mapping	System Thinking	System map
Problem-solving	Data Literacy	Analysis notes

Trainer's Guide

Facilitation Principles

- Key Approaches:
  - Outcomes-based orientation: Each activity is explicitly linked to planned learning outcomes
  - Student-centered pedagogy: Modeling active, collaborative, and reflective learning
  - Technology-enhanced learning: Integration of concrete examples of digital tools
  - STEAM & entrepreneurship orientation: Focus on interdisciplinary problem-solving and innovation
- Daily Methodological Recommendations
  - Day 1: Focus on creating a safe learning environment and establishing interaction principles. Use of interactive methods to demonstrate pedagogical principles.

  - Day 2: Real-time integration of digital tools. Practical work with systems and platforms. Development of analytical thinking through concrete tasks.
  - Day 3: Special day with employer visits (09:00-12:00). Visit preparation includes developing questions and objectives. Reflective session after visit to connect theory with practice.
  - Day 4: Synthesis of all modules through action planning and personal development. Focus on long-term professional growth and self-organization.
- Connection to Independent Work
  - Module 1: Course analysis and reflective essay — 8 hours
  - Module 2: Digital and systems-oriented assignments — 10 hours
  - Module 3: Competence-based redesign and SDG integration — 12 hours
  - Module 4: Individual professional development plan — 10 hours

Independent Work and Assessment (40 hours)
Independent work aims at deepening course content, reflection, and practical application:

- Analytical Activities (18 hours):
  - Analysis of own course and pedagogical approaches — 6 hours
  - Systems and digital course analysis — 4 hours
  - Assessment and feedback analysis — 4 hours
  - Additional reading and case analysis — 4 hours
- Project Work (12 hours):
  - Design of interactive/practice-oriented assignment — 6 hours
  - Integration of sustainable development and interdisciplinarity — 6 hours
- Professional Reflection (10 hours):
  - Reflective essay and professional development self-assessment — 4 hours
  - Individual professional development plan and time management — 6 hours
- Assessment System
  - Formative Assessment:
    - Participation in discussions and group activities

        - Completion of mini-assignments within 30-minute blocks
        - Reflective notes and self-assessment
    - Summative Assessment:
        - Independent work portfolio
        - Final project on redesigning own course
        - Presentation of individual development plan

Practical Instructions for Trainers (iPEERs)

1. Prepare in Advance

- Prepare **short, focused materials** for each 30-minute session (slides optional; interaction is mandatory).
- Prepare **2–3 guiding questions or tasks** for discussion or reflection per session.
- Review the **learning outcomes of your assigned module** and ensure every activity clearly supports them.
- Prepare **real examples from your own teaching or practice** to illustrate concepts.

2. Bring to the Training

- Laptop with all materials **offline-accessible**.
- **Printed handouts or worksheets** (1–2 pages per session) if digital tools are not required.
- Markers, sticky notes, flip-chart paper (or be ready to request them).
- Access credentials to any **digital tools or platforms** you plan to demonstrate (LMS, AI tools, polling apps, etc.).

3. Deliver Interactive Sessions (Mandatory)

- Do **not** rely on lectures only.
- Each session must include at least **one interactive element**, such as:
    - Small-group discussion
    - Case analysis
    - Short design task
    - Reflection exercise
    - System mapping or role play

- Encourage participants to **work with their own courses or teaching experience**.

4. Apply Module-Specific Methodologies

Different modules require different pedagogical approaches.

Module 1 – Engineering Pedagogy & Learner Engagement
- Focus on: interaction, communication, motivation.
- Use: round tables, reflective questions, role-based discussion.
- Pay attention to creating a **safe and open learning environment**.

Module 2 – Digital, Practice-Based & Systems Learning
- Focus on: tools, systems, application.
- Use: demos, group tasks, system mapping, problem-solving.
- Show **how**, not only **what** (practical demonstrations).

Module 3 – Competence-Based Design, Assessment & Sustainability
- Focus on: design, assessment, alignment.
- Use: workshops, rubrics, competence matrices, peer review.
- Pay attention to **constructive alignment** and real curriculum examples.

Module 4 – Leadership, Innovation & Professional Responsibility
- Focus on: reflection, values, action planning.
- Use: case discussion, self-assessment, scenario analysis.
- Encourage **personal and institutional action plans**.

5. Manage Time Strictly
- Respect the **30-minute session structure**.
- Plan:
  - 5–7 minutes input
  - 15–20 minutes activity
  - 5 minutes reflection or synthesis

- Coordinate transitions with other trainers when sessions are linked.

6. Connect to Independent Work

- Clearly explain how your session links to:
  - Course analysis
  - Digital or systems tasks
  - Assessment redesign
  - Professional development planning

- Avoid introducing tasks that are **not aligned** with the independent work structure.

7. Facilitate, Don't Dominate

- Your role is **facilitator**, not lecturer.
- Encourage participation from all attendees.
- Manage dominant voices and support quieter participants.

8. End Each Session with a Clear Output

- Ensure participants leave with:
  - A written note, draft, map, or idea
  - A clear takeaway they can apply in their own teaching

- Summarize **"what can be transferred to practice tomorrow"**.

Quality Assurance and Control

- Quality Criteria
  - Alignment with WP3 objectives and D3.2 cluster structure
  - Full coverage of all 20 PDPs and 10 thematic clusters
  - Transparent distribution of contact and independent hours
  - Outcomes-based orientation and competence approach
  - Practice-oriented components, including employer visits
  - Methodological consistency of all program documents

- Quality Control Procedures
  - Internal Control:
    - Joint design and review by European and Kazakhstani partners
    - Alignment with PDP learning outcomes and competence gaps validated in D3.1
    - Informal piloting through internal presentations and feedback cycles
  - External Control:
    - Material versioning (v0 9-10-2025) for tracking improvements
    - Integration of feedback from pilot deliveries and educator surveys
    - Potential alignment with national staff development frameworks and ENAEE/ENTER standards

The program documentation set is methodologically coherent, internally consistent, and fully compliant with WP3 and Deliverable D3.2 requirements. No critical revisions are required. The program is considered audit-ready.

Conclusion and Development Prospects

Program Achievements

- The EduFusion NSG comprehensive training program represents an innovative model for professional development of engineering faculty that:
- Integrates all key competency areas of modern engineering education
- Provides a flexible implementation model adaptable to various institutional contexts
- Ensures connection between theory and practice through interaction with industry partners
- Supports continuous professional development through structured independent work

Planned Learning Outcomes

Upon program completion, participants will be able to:

- Design competence-oriented courses with digital technology integration

- Apply innovative pedagogical methods and interactive learning formats
- Develop learning outcome assessment tools and feedback systems
- Integrate sustainable development principles and interdisciplinary approaches
- Conduct reflective and leadership pedagogical practice
- Interact effectively with stakeholders and industry partners

Scaling Prospects

The program creates a solid foundation for future iterations, adaptations, and scaling:

- Institutional Level:
  - Integration into existing staff development programs
  - Adaptation to specific faculty and department needs
  - Creation of communities of practice and experience sharing
- National Level:
  - Alignment with national standards and qualification frameworks
  - Development of trainer and multiplier networks
  - Creation of online platform for continuous learning
- International Level:
  - Exchange of best practices with European partners
  - Participation in international engineering education networks
  - Contribution to global educator training standards development

The EduFusion NSG program not only completes the planned set of training materials but also provides a sustainable foundation for transforming engineering education in Kazakhstan and partner countries, contributing to the creation of an innovative educational ecosystem oriented toward modern labor market needs and sustainable development challenges.