



Modernization and Internationalisation of Iranian HEIs via collaborative TEL-based curriculum development in engineering and STEM

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DEL 2.1. UNITEL TRAINING PATH

Course syllabus



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Author	Matti Lappalainen, University of Turku (UTU), FIN Heli Brander, University of Turku (UTU), FIN
Reviewers	Università degli Studi Guglielmo Marconi Sara Cella, Matteo Martini, Ilaria Reggiani University of Aberta João Paz
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NAMES OF COURSE MATERIAL AUTHORS

Università degli Studi Guglielmo Marconi
Matteo Martini
Domenico Morreale

University of Turku
Heli Brander
Matti Lappalainen
Kaisu Paasio

University of Alberta
João Paz
Maria do Carmo Pinto
António Teixeira

PRISMA Electronics
Emorfili Terzimpasoglou

Imam Khomeini International University
Mohsen Alvandi
Ashgar Azizian
Mohsen Davoudi
Amir Zarkeshan

University of Sistan and Baluchestan
Hadi Esmaeeli
Mehri Rajaei

Shiraz University
Shahram Mohanna
Ali Akbar Safavi
Ghasem Salimi

University of Isfahan
Hamid Reza Marateb
Farshid Mossaiby
Azam Naghavi
Seyed Komail Tayebi
Zahra Zamani

Shahid Chamran University of Ahvaz
Gholamhossein Rahimidoost





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Acronyms

DL – Distance learning

HEI – Higher Education Institution

ICT – Information and Communication Technology

LMS – Learning management system

PrACT – Practicability, Authenticity, Transparency, Consistency (in assessment)

QA – Quality assurance

STEM – Science, Technology, Engineering, Mathematics

TEL – Technology Enhanced Learning

UTT – University Technology Transfer

WP – Work Package





Abstract

This deliverable describes the syllabus of UNITEL e-course. The aim of the course is to empower Engineering and STEM departments at Iranian partner universities in enhancing skills and competences of professors and instructional designers on innovative collaborative ICT-based practices. The course has six online modules and each module has six topics. Each topic has an online video lesson supported by lecture notes and PowerPoints. In the end of each topic there is a multiple-choice evaluation. In addition of independent online studying the course consists of two face-to-face sessions (in the beginning and in the end) and three webinars. The studying is supported by two local tutors in Iranian universities.





1. Course description

1.1. The aims of the UNITEL e-course

The overall aim of the UNITEL e-course is to empower Engineering and STEM departments at Iranian universities in enhancing skills and competences of professors and instructional designers on innovative collaborative ICT-based practices. These practices are seen as a means to increase curriculum modernisation and internationalisation. The course is motivating the academic staff to acquire key competences and skills crucial for the integration of technology enhanced (TEL) pedagogical approaches in university curricula. It will also promote rational applications of new collaborative teaching and learning ICT-based methodologies. The course is developed together with Iranian and European partners.

General learning objectives of the e-course are:

- To learn the principles of digitalization and enabling technologies that lead to innovative pedagogical practices;
- To learn current trends in pedagogy (industry-relevant, working life oriented pedagogies such as project-based learning and problem-based learning) through the use of pedagogical scripts and instructional scaffolding;
- To learn technologies, protocols and tools for applying ICT in processes and services;
- To be able to implement a project for the digital transformation of a process, area, or department.

The materials of the course will be produced in English and then translated in Farsi.

1.2. The participants of the course

The target group of the e-course are the university professors/lecturers and instructional designers in the Iranian partner universities: at least 91 professors and instructional designers from the universities will register and follow the e-course (15-16 participants/university). In each partner university 70% of the participants will be professors. By the participants and the projects which the participants are elaborating during the e-course, at least 70 courses are modernised by teaching staff till the end of the UNI-TEL project.

The e-course is a good opportunity to clarify the role and functions of the instructional designers in the Iranian universities.

1.3. The structure of the course

The course will include different types of elements (figure 1):

- 36 video lessons (from 15 – 40 minutes) to be attended on the platform in



- asynchronous modality;
- 3 webinar sessions (at beginning / Kick-off, mid-term and end of the e-course / Closure) to be attended synchronously by all participants;
- 2 in presence sessions at institutional level at the beginning and end of the e-course. The trained tutors will organise, moderate and facilitate the in-presence sessions in their own institution
- a voluntary individual project plan supported by module assignments (Appendix 1) in the end of each module. These assignments are supporting the modernization of university teaching by integrating the themes of the course in participants' work practices

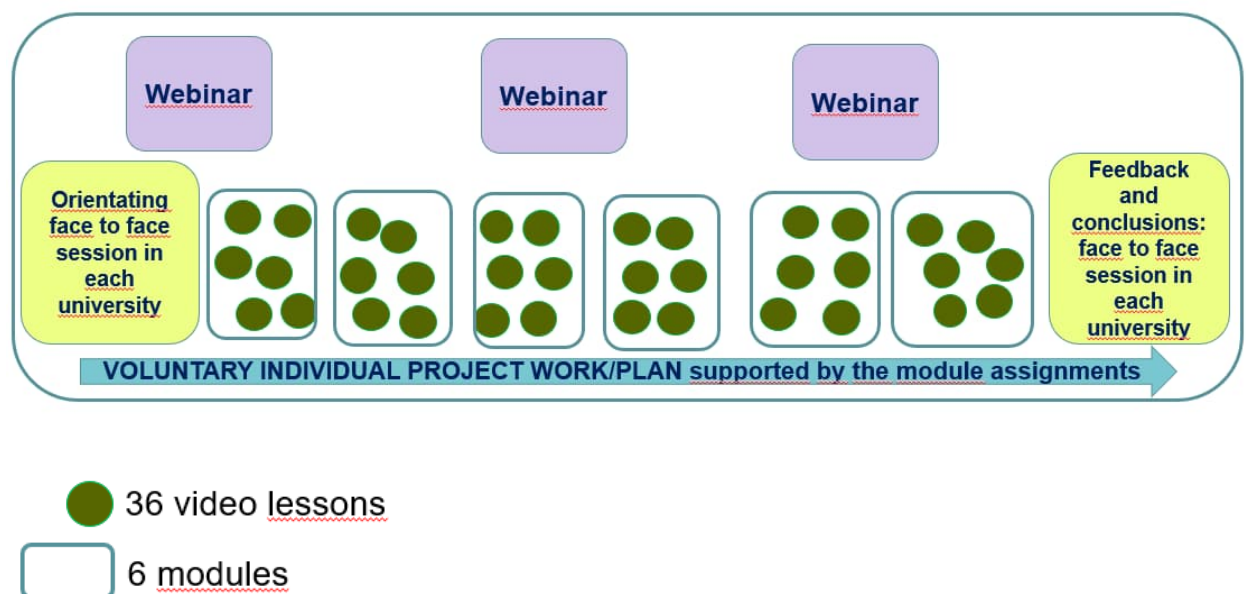


Figure 1. The elements of the UNITEL e-course

1.4. Course content

The course content (the modules and the topics) is presented in table 1:

UNITEL e-course modules and topics	
MODULE 1: Orientation to the course and modern concepts of learning	
M1-1	Orientation to the course
M1-2	The current state of Iranian higher education - Lessons learnt from the UNITEL Project survey (WP1)
M1-3	The concept, models and implementations of e-learning
M1-4	Designing quality e-learning
M1-5	Process of e-Learning Design
M1-6	Concluding remarks
MODULE 2: Student-centered learning in practice and in STEM	
M2-1	How to build learner-centered e-learning
M2-2	Engaging and motivating students with real-world problems in STEM teaching
M2-3	Student engagement and motivation through voluntary subject choice and flexibility in STEM teaching
M2-4	Building and utilizing community and collaboration in e-learning
M2-5	Case example(s) of online implementations of STEM
M2-6	Open educational resources (OER) and MOOCs in online oriented STEM teaching
MODULE 3: Methods and tools of technology enhanced learning (TEL)	
M3-1	Building the cornerstones: Teamwork and IT support in universities
M3-2	Web applications, tools and programs – examples and practices
M3-3	Activating methods and online tools to enrich online learning
M3-4	Pedagogical models of e-learning
M3-5	Implementing advanced virtual learning (including virtual and remote labs)
M3-6	Best practices of virtual and remote labs
MODULE 4: Cooperation with the industry and working life relevant skills	
M4-1	Generic skills of STEM experts (21st century skills)
M4-2	University-Business collaboration: An overview and some examples
M4-3	University's Technology Transfer (TT) strategies and ecosystems in European and Iranian universities
M4-4	Embedding Enterprise in the Curriculum I: Internships, alumni speakers and company visits
M4-5	Embedding Enterprise in the Curriculum II: Joint Masters' thesis at companies and project assignments
M4-6	Cooperation and engagement of students in engineering and science education

Table 1. The modules and the topics of UNI-Tel e-course (continuing)

MODULE 5: Assessment and feedback as a part of teaching and learning	
M5-1	Lessons learnt from the national survey in Iran: Student opinions (WP1) on the role assessment
M5-2	A framework for digital assessment
M5-3	Strategies to reduce plagiarism in e-learning
M5-4	Learning analytics
M5-5	Electronic exams
M5-6	Automatization of feedback
MODULE 6: Modernization of teaching	
M6-1	Strategies and policies supporting development
M6-2	Quality assurance (QA) standards of e-learning
M6-3	Degree evaluation
M6-4	How to utilize feedback as a source of development
M6-5	Curriculum development
M6-6	Staff development as a tool for development

Table 2. The modules and the topics of UNI-Tel e-course

1.5. Tutors of the course

Each Iranian partner university has selected at least 2 tutors among its own staff. The tutors are facilitating the course delivery in partner universities. They are also organising face to face sessions in the beginning and in the end of the e-course. The tutors are also the contact point between project partners.

1.6. UNITEL virtual environment

The e-learning platform (learning management system, LMS) to deliver the course is Moodle. It's realized and supported by PRISMA. The environment includes all the materials contacts and a discussion forum. Also, the tracking of participants' individual learning activity is included.

1.7. In presence sessions

Two in presence sessions are organized at for the participants in their own university by the tutors:

- Session in the beginning:
 - Getting to know each other and the e-course
- Session in in the end of the course:
 - Feedback
 - Conclusions
 - Ideas for improvement

1.8. Webinars

There will be three synchronous webinars:

Kick-off webinar

In Kick-off webinar the participants are welcomed to the training. Also, the basics of the whole UNITEL project are introduced by giving the floor to Iranian and European partners. There will be an introduction to the e-course content /structure, scheduling, assessment practices, the learning platform, and the role of the tutors.

Mid-term webinar

In mid-term webinar offers a possibility to compare the experiences between universities.

Closure webinar

The closure webinar will provide an overview of the process in national level.

1.9. Assessment and quality assurance

In the end of each topic learning is evaluated by two multiple-choice questions (altogether 72 questions during the course). In addition to that, each module has module-specific reflective questions (Appendix 1), which are supporting to integrate the themes of the course in own work practices. Considering the wide range of participant profiles, there are tailored questions for teachers and for instructional designers.

In the beginning of the course the expectation questionnaire and in the end a satisfaction questionnaire is filled.



2. Modules and topics

UNI-Tel e-course has six modules (M1, M2... M6). Each of them has six topics (M1-1, M1-2... M6-6). The objectives and the content of the modules and topics are presented in the following chapters.

2.1. MODULE 1: Orientation to the course and modern concepts of learning

2.1.1.M1-1 Orientation to the course

The objectives of the lesson are:

- The participant gets basic information about UNI-TEL e-course and its objectives, content and studying practices.
- The participant gets basic information about the requirements and expectations of participating at the UNI-TEL e-course.
- The participant gets knowledge and understanding about his/her role in the learning process.

Themes are:

- Theme 1. Welcome to the UNI-TEL e-course!
- Theme 2. Course's objectives and target groups
- Theme 3. Course's content and learning model
- Theme 4. Course's technical operating environment
- Theme 5. Course's progress and forms of studying
- Theme 6. Project work/plan and its role
- Theme 7. Tasks and role of the participants
- Theme 8. Course's performance criteria
- Theme 9. Course's assessment
- Theme 10. Guidance and support provided





2.1.2.M1-2 The current state of Iranian higher education - Lessons learnt from the UNITEL Project survey (WP1)

The objectives of the lesson are:

- Understand the pedagogical concepts used to design the UNITEL Project survey (WP1)
- Understand the methods used to assess the validity and reliability of questionnaires
- Discuss the reliability of the WP1 questionnaire
- Understand how to extract higher-level information from the WP1 questionnaire using statistical and data mining methods
- Discuss the limitations and future activity of current pedagogical concepts of the courses presented in Iranian universities, compared to the state-of-the-art.

The themes are:

- Pedagogical concepts used in the design of the WP1 questionnaire
- Pedagogy for technology-enhanced learning
- The ACRS model
- Reliability, and validity in survey analysis
- Data mining and statistical analysis of surveys
- Survey analysis results of Iranian Universities
- Pedagogical concepts in Iranian universities and the state-of-the-art
- The limitations of current pedagogical concepts and future activity

2.1.3.M1-3 The concept, models and implementations of e-learning

The objectives are:

- Learners will be introduced to the concept of e-learning
- Learners will be introduced to the benefits of e-learning
- Learners will be introduced to the limitations of e-learning
- Learners will become familiar with e-learning strategies
- Learners will become familiar with models and types of e-learning
- Learners will become familiar with e-learning implementation strategies

The themes are:

- concept of e-learning
- benefits of e-learning





- limitations of e-learning
- e-learning strategies
- types of e-learning
- e-learning implementation strategies

2.1.4.M1-4 Designing quality e-learning

The objectives of the lesson are:

- Understand the principal aspects to be considered for a quality e-learning
- Understand how to prepare lessons specifically prepared for a distance fruition
- Discuss the different possibilities offered by virtual classes
- Understand how to create effective virtual class
- Discuss the potentialities of a syllabus as a learning object

The themes are:

- Design quality e-learning
- The Deming cycle of distance learning material
- Lesson structure
- Lesson preparation and delivery
- Virtual class definition and potentialities
- Some example of virtual class software
- Aim of virtual class and students' involvement
- Syllabus structure
- Syllabus as a learning object to guide students

2.1.5. M1-5 Process of e-Learning Design

The objectives of the lesson are:

- Understand the main historical phases of the e-learning development
- Understand the main tools for designing and building quality e-learning
- Understand important aspects (and limitations) of different solutions for e-lessons
- Know potentialities offered by internet and other professional solution to develop e-courses

The themes are:

- Computer-Based Training (CBT) and Web-Based Training (WBT): benefits and disadvantages
- Building an e-learning course
- Video-lessons





- Audio-lessons
- Green Screen

2.1.6. M1-6 Concluding remarks

The objectives are:

- Learners will be introduced to the main remarks on orientation to the course,
- Learners will be introduced to the main lessons and experiences learnt from work package 1,
- Learners will be introduced to the main considerations on concept, models and implementations of e-learning,
- Learners will be introduced to the main remarks on Designing quality e-learning,
- Learners will be introduced to the main remarks in Process of e-Learning Design.

The themes are:

- The main remarks on orientation to the course,
- The main lessons and experiences based on workpackage1,
- The main considerations on concept, models and implementations of e-learning,
- The main remarks on designing quality e-learning,
- The main remarks in process of e-Learning Design.

2.2. MODULE 2: Student-centered learning in practice and in STEM

2.2.1. M2-1 How to build learner-centered e-learning

The objectives are:

- Learners will be introduced to learner-centered e-learning
- Learners will be introduced to characteristics of learner-centered e-Learning
- Learners will be introduced to Key Ingredients of Learner-centered eLearning Courses
- Learners will become familiar with How is a learner-centered learning environment designed
- Learners will become familiar with Practices To Create Learner-Centered e-Learning Courses
- Learners will become familiar with assessment in a learner-centered learning environment

The themes are:

- Concept of learner-centered e-learning
- Characteristics of learner-centered e-Learning



- Key Ingredients of Learner-centered eLearning Courses
- How is a learner-centered learning environment designed
- Practices to Create Learner-Centered e-Learning Courses
- Assessment in learner-centered environment

2.2.2.M2-2 Engaging and motivating students with real-world problems in STEM teaching

The objectives are:

- To introduce the role of real-world problems as a part STEM teaching
- To present case examples

The themes are:

- What are the real-world problems in Engineering?
- Measurement in Industry
- Course of Advanced Measurement in University
- Measurement Problems in Real World
- Skills Learned through the Online Course
- Course Project Examples
- Conclusion

2.2.3. M2-3 Student engagement and motivation through voluntary subject choice and flexibility in STEM teaching

The objectives are

- To introduce the possibilities of voluntary subject choice in STEM studies
- To present the evaluations methods used with voluntary subject choice

The themes are

- Case examples of voluntary subject choice

2.2.4. M2-4 Building and utilizing community and collaboration in e-learning

The objectives of the lesson are:

- To understand how student motivation and other aspects of learning can be reinforced by student interaction
- To know how student interaction can be supported in virtual learning environments in different phases of learning



- To understand the challenges connected to collaborative e-learning
- To ponder how professors/lecturers could exchange ideas and compare different ways to create student cooperation

The themes are:

- Collaboration in learning
- Digital technologies and participation
- Using collaboration and technologies during different phases of learning: planning, learning and assessment
- Flipped learning
- Teacher collaboration supporting student collaboration
- Challenges in collaborative learning

2.2.5. M2-5 Case example(s) of online implementations of STEM

The objective is:

- To share the experiences gained from the virtual courses
- To show how real-world cases can be utilized in HE teaching

The themes are:

- Variety of methods used to motivate students, e.g. joint teaching, challenging questions, participating students in class activities
- Grading as a part of teaching

2.2.6. M2-6 Open educational resources (OER) and MOOCs in online oriented STEM teaching

The objectives of the lesson are:

- To recognize the different movements promoting openness in science research, innovation and education and identify synergies and interconnections between them
- To characterize Open Educational Resources (OERs) and identify its typical features and contexts of use;
- To distinguish MOOCs according to different design patterns and select the most appropriate to each given learning need;
- To search, find and assess OERs and MOOCs for STEM teaching and learning situations;
- To implement Open Educational Practices in STEM teaching and learning.

The themes are:

- The open science ecosystem: opening up sources, access, data and education



- Open educational resources (OER): 5Rs framework, open licenses, and major repositories
- MOOCs: design types, learning features and major platforms
- From OER and MOOCs to open educational practices (OEP): promoting innovation, flexibility, and personalization in STEM teaching

2.3. MODULE 3: Methods and tools of technology enhanced learning (TEL)

2.3.1. M3-1 Building the cornerstones: Teamwork and IT support in universities

The objective is:

- To describe perspectives and key issues for building an institutional E-Learning (EL) infrastructure to ensure quality implementations.

The themes are:

- Infrastructure: e.g. computers, adequate software, constant electricity and high-bandwidth internet
- modification or changes of organizational structure and processes, policy and regulations, Staff Management, education office regulations, IT department facilities, systems and Apps, E-Learning office, finance office and faculties.
- The shift to EL requires modernization even in the course curriculum and structure as well as academic and educational practice.

2.3.2. M3-2 Web applications, tools and programs – examples and practices

The objectives of the lesson are:

- Define the categories of technologies needed in e-learning.
- Define the participants involved in e-learning.
- Understand the levels of granularity in e-learning.
- Introduce different tools for the different categories.
- Give some examples of the different tools.

The themes are:

- Categories of technologies needed in e-learning
- Participants and processes
- Levels of granularity

- Tools for the create category with examples
- Tools for the host category with examples
- Tools for the offer category with examples

2.3.3. M3-3 Activating methods and online tools to enrich online learning

The objectives of the lesson are:

- To get acquainted with the synchronous activating methods and online tools in the online classroom to challenge students for better understanding
- To learn asynchronous tools to activate students for deeper learning
- How to help student to maintain their concentration and deepens learning towards the higher-level skills like critical thinking
- To get acquainted with activating methods to increase the accuracy and enthusiasm of students in following the educational content

The themes are:

- Activating methods and tools in online classroom on BigBlueButton and Adobe Connect platform
 - poll
 - chat
 - whiteboard, split whiteboard
 - breakout
- Asynchronous activating methods and tools on moodle platform
 - lesson
 - forum
 - padlet
 - assignment

2.3.4. M3-4 Pedagogical models of e-learning

The objectives are:

- To give an overview of adopting innovative educational technologies in the framework of didactic models and strategies able to improve the quality of e-learning.
- To show an integrated approach: matching models, strategies, technologies and media design.



The themes are:

- E-learning models
- Architectures
- Strategies
- Transmedia education
- Immersive video

2.3.5. M3-5 Implementing advanced virtual learning (including virtual and remote labs)

The objectives of the lesson are:

- Understand what we are considering advanced solutions for virtual learning
- Understand how to integrate simulations, animations and case studies in the learning process
- Discuss gamification and learning-by-playing
- Understand the use of technological solutions for laboratories in TEL
- Introduce virtual and remote lab approach

The themes are:

- The passage from e-learning to TEL
- The problem of laboratory in TEL
- How to improve learning using TEL
- Custom and free available solutions
- Role play games, case studies and other solutions to improve learning
- The gamification approach
- The passage from simulation to virtual and remote lab
- Introduction to virtual lab and remote approach

2.3.6. M3-6 Best practices of virtual and remote labs

The objectives are:

- To get the participants familiar with the concepts of virtual and remote labs
- To present the factors effectiveness of remote labs in learning outcomes
- To show the experiences of students on the quality of virtual and distance labs



The themes are:

- Some examples of virtual labs and remote labs: Global and Local
- Design and implementation of virtual laboratories and remote laboratories in Iranian engineering education, Shiraz University example
- Factors on the effectiveness of remote labs in learning outcomes
- Students' perspectives on the quality of design and activity and their learning outcomes in virtual and distance labs: an Iranian experience

2.4. MODULE 4: Cooperation with the industry and working life relevant skills

2.4.1. M4-1 Generic skills of STEM experts (21st century skills)

The objectives are:

- To involve the participants in knowing 7 Key features of the 21st century in teaching and learning contexts
- To support the integration on 21st century skills in STEM teaching
- To present employer perspectives on STEM graduate skills

The themes are:

- 7 Key features of the 21st century in teaching and learning contexts
- Employer perspectives on STEM graduate skills' and the current and future value in developed and developing countries.
- Integrating 21st century skills in the STEM students 'teaching, and learning process
- Introducing learning activities to develop STEM experts ' 21st-century skill
- Using several examples to analyze how we can support the development of 21st-century skills through ICT
- Transferring the best assessing strategies for STEM experts ' 21st-century skills

2.4.2. M4-2 University-Business collaboration: An overview and some examples

The objectives are:

- Learners are provided with the conceptual discussion of university -business collaboration
- Learners are provided with empirical findings of examination of the links between university-industry collaboration (UIC) predictors (inputs) and the results of UIC cooperation (outputs).
- Analyzing Examples of university-business collaborations related to Iran and selected foreign countries.



- Motivating the academic staff to acquire key competences and skills in order to learn business plan preparation, commercialization, entrepreneurship, etc.

The themes are:

- The assessment of theoretical analysis on effects of main determinants on university-business collaboration.
- Key skills of business plans/policies for inclusion of pedagogical approaches in university curricula (some evidence).
- Empirical method such as the partial least squares structural equation modelling (PLS-SEM), to explore the links between variables (To be done during the course).
- Several examples of practice

2.4.3. M4-3 University's Technology Transfer (TT) strategies and ecosystems in European and Iranian universities

The objectives are:

- To become familiarized with the Triple helix model that depicts the collaboration among universities, government and industry.
- To understand the concept of (University) Technology Transfer (UTT) and its various modelling.
- To become familiarized with different UTT strategies and ecosystems.

The themes are:

- The classic cooperation model, the Triple helix model of innovation
- University technology transfer, the traditional perspective
- University technology transfer, alternative views
- Some strategic considerations of university technology transfer
- Towards a broader view: an ecosystem of UTT

2.4.4. M4-4 Embedding Enterprise in the Curriculum I: Internships, alumni speakers and company visits

The objectives are:

- To understand the motivation for embedding enterprise in the curriculum
- To become familiarized with different perspectives to embedding enterprise in the curriculum



- To gain an overview of different methods and means to embed enterprise in the curriculum
- To become familiarized with some successful case examples of embedding enterprise in the curriculum

The themes are:

- Universities and the need for embedding enterprise in university and in the curriculum
- Ways to embed enterprise in university and in the curriculum
- Broadening the concept of entrepreneurship
- Different perspectives to teaching entrepreneurship /enterprise
- The entrepreneurial approach and the entrepreneurial teacher
- Case examples of how to embed enterprise in the curriculum

2.4.5. M4-5 Embedding Enterprise in the Curriculum II: Joint Masters' thesis at companies and project assignments

The objectives are

- To present the concepts of "Industry 4.0" and "Industry 5.0"
- To introduce the possibilities of industry based curriculum
- To show examples how to support industry-relevant skills of students

The themes are

- The importance of university and industry collaboration revisited
- Industry 4.0 and Industry 5.0 and higher education developments
- Industry 4.0 and Skill 4.0
- Industry based curriculum design
- Strategies and programs to support industry-relevant skills of students
- Strategies to joint master' thesis at companies, and project assignments

2.4.6. M4-6 Cooperation and engagement of students in science and engineering education

The objectives are:

- To introduce practical examples of cooperative teaching methods which are supporting the engagement of students
- To present case study including various combinations of teaching methods



The themes are:

- Flipped learning and flipped class
- Cooperative learning as an instructional model in science and engineering education
- Project-based learning as a learning and teaching strategy in science and engineering education
- Problem-based learning as a learning and teaching strategy in science and engineering education
- Team-based learning as a learning and teaching strategy in science and engineering education
- Game-based learning as a learning and teaching strategy in science and engineering education
- Real experiences: a case study with various combinations

2.5. MODULE 5: Assessment and feedback as a part of teaching and learning

2.5.1. M5-1 Lessons learnt from the national survey in Iran: Student opinions (WP1) on the role assessment

The objectives are

- Learners will get familiar with the current status of Iranian students views.
- Learners will get familiar with the importance of learning assessment in Iranian universities regarding the national survey.
- Learners will get familiar with the current statuses of learning assessment in TEL courses in Iranian universities
- Learners will get familiar with the current statuses of assignments in TEL courses in Iranian universities
- Learners will get familiar with the current statuses of feedback in TEL courses in Iranian universities
- Learners will be introduced success and failures of learning assessment in Iranian universities based on national survey

The themes are

- current status of Iranian students views,
- importance of learning assessment in Iranian universities,
- current statuses of learning assessment in TEL courses in Iranian universities
- current statuses of assignments in TEL courses in Iranian universities,



- current statuses of feedback in TEL courses in Iranian universities,
- success and failures of learning assessment in Iranian universities based on national survey

2.5.2. M5-2 A framework for digital assessment

The objectives are

- To characterize the new culture of assessment, differentiating it from the traditional assessment culture.
- To identify the main dimensions and parameters of the PrACT framework for digital assessment.
- To analyze the concept of regulated learning and its relationship with Peer and Self-Assessment.
- To distinguish digital tools, instruments, and means of assessment.
- To design a Digital Assessment Plan.

The themes are

- A new Assessment Culture
- The PrACT framework for digital assessment
- Regulated Learning: Peer and Self-Assessment in Higher Education
- Digital tools, instruments, and means of assessment
- Assessment planning

2.5.3. M5-3 Strategies to reduce plagiarism in e-learning

The objectives are

- To find out reasons for plagiarism
- To introduce strategies and resources to prevent plagiarism

The themes are

- What is plagiarism?
- Why students plagiarize?
- Damages caused by plagiarism in online courses
- Methods to detect/reduce/avoid cheating in online courses
- Resources for detecting plagiarism in online learning
- Technological, cultural and religious considerations
- Conclusion

2.5.4. M5-4 Learning analytics

The objectives are

- Understand the importance of assessment and self-assessment in DL
- Understand what is learning analytics and how to collect data
- Analyse learning data converting raw data into information
- How to use feedback from data
- Know a practical example of solution developed by USGM

The themes are

- Assessments and self-assessments in distance learning
- How to enforce student-student and students-teacher interaction in DL
- Learning analytics and different type of raw data
- Solutions to collect data from students' activities
- How to transform raw data into learning information
- Case study: multiple answers questionnaire in USGM and data analytics

2.5.5. M5-5 Electronic exams

The objectives are

- Understand the different types of exams depending on the particular course
- Technological solutions for students' identification
- Platforms and software for electronic exams
- Know the most used technological solutions for electronic exams
- Avoid cheating during electronic exams

The themes are

- Different types of exams necessary for different subjects
- COVID case and some info on national regulations in Europe for electronic exams
- How to identify students before exams
- Hits on technological solutions for identification



- Possible platforms to perform electronic exams
- Hardware and other requests for electronic exams
- Solutions to avoid cheating during exams (focus control, staff supervisor, etc.)

2.5.6. M5-6 Automatization of feedback

The objectives are

- Understand how the students-teacher interaction is possible in distance learning
- Distinguish among synchronous and asynchronous activities in distance learning
- Understand the importance of feedback to improve learning process
- Implement automatic feedback in the different learning environment
- Understand how to collect feedback and extrapolate information

The themes are

- Distance learning, e-learning, TEL, three different solutions
- Possibility to implement and improve students-teacher interaction in distance learning
- The role of Tutor in TEL
- Synchronous and asynchronous activities
- Feedback and learning
- How to implement automatic feedback in the different learning solutions
- Improve learning following automatic feedback

2.6. MODULE 6: Modernization of teaching

2.6.1. M6-1 Strategies and policies supporting development

The objectives are

- To show the big picture and implications of “virtualisation”
- To present the elements and the ways to support development in transformation

The themes are

- Strategies and policies supporting transformation
- Flexible academic frameworks as a part of change
- The need for innovative pedagogical approaches, new forms of assessments, cross-institutional accreditation and credit transfer agreements
- Institutional collaboration in development and delivery,





- Commitment to equivalence of access for students on and off-campus

2.6.2. M6-2 Quality assurance (QA) standards of e-learning

The objectives are

- Understand the meaning of e-learning quality and quality assurance
- Distinguish several International Quality Assurance Frameworks for e-learning
- Characterize the specificities of Quality Assurance for MOOCs
- Identify the main Standards and Guidelines for Quality Assurance of online Higher Education

The themes are

- Quality and quality assurance in e-learning
- International Quality Assurance Frameworks for e-learning
- Quality Assurance Frameworks of e-learning: the case of MOOCs
- Main considerations for Quality Assurance of online Higher Education

2.6.3. M6-3 Degree evaluation

The objectives are

- Identify the main standards and guidelines of the reference framework for internal quality assurance systems in Higher Education of Portugal
- Characterize the assessment procedures of Higher Education Study Programs in Portugal
- Clarify how students may participate in quality assessment procedures
- Reflect on assurance of teaching staff quality

The themes are

- The reference framework for internal quality assurance systems in Portuguese higher education institutions
- Assessment procedures of Higher Education Study Programs in Portugal
- Student participation in quality assessment
- Teaching staff quality



2.6.4. M6-4 How to utilize feedback as a source of development

The objectives are

- To introduce different objectives and ways of evaluation
- To present effective ways of feedback

The themes are:

- Teacher evaluation, Why?
- Summative evaluation, advantages and disadvantages
- Formative evaluation, advantages and disadvantages
- Ways of evaluation
- Providing effective feedback, How?
- Surveys for the course validation

2.6.5. M6-5 Curriculum development

The objectives are

- To introduce basic concepts of curriculum design
- To present ways for online curriculum development

The themes are

- Initial conceptualization, curriculum concept and curriculum design
- University curricula and the necessity of changes
- Principles of curriculum development
- The curriculum development process and steps
- Strategies and methods for curriculum development in science and engineering education
- Considerations on curriculum implementation and evaluation
- Online curriculum and course development expectations



2.6.6. M6-6 Staff development as a tool for development

The objectives are

- To understand role of the strategic documents as an important backbone for development
- To give insight to the strategic documents of own university
- To understand the great variety of ways in supporting staff in digitalization of teaching and learning
- To support in finding ways how different forms of staff development could be utilized in own work as a leader, professor, lecturer or IT-designer

The themes are

- Staff development as a way to enhance digitalization of teaching and learning in the strategies and policy documents
- Different ways of staff development: e.g. training, mentoring, self-study, peer-learning
- Self-reflection of own digital competences



APPENDIX 1. MODULE-SPECIFIC ASSIGNMENTS

MODULE	ASSIGNMENT IN THE END OF THE MODULE (LINKED TO OWN PROJECT WORK/PLAN)
MODULE 1: Orientation to the course and modern concepts of learning	Own project work/plan - My specific interests / developing idea: Regarding the course contents, what are your specific interests and developing goals? What are the questions that you want to find an answer to? Who are the “users” / what is the specific target group of your developing work?
MODULE 2: Student-centred learning in practice and in STEM	Target group analysis: How could you support student-centred learning in your own work as a lecturer, IT-designer or manager? Describe your main target group in more detail and tell which are the best ways to motivate and “serve” them.
MODULE 3: Methods and tools of technology enhanced learning (TEL)	Technology and activating methods: What are the possibilities of technology for activating students at the university? What kind of technology would you like to use: Present an activating method or online tool which you could use / could be used to activate students? What challenges you may face?

Appendix 1 (2/2)

<p>MODULE 4: Cooperation with the industry and working life relevant skills</p>	<p>Networks and cooperation:</p> <p>a) How could you make sure that your actions (e.g. teaching, IT-support) are up-to-date and they are in line with the requirements of the current working life outside university?</p> <p>b) With whom could you cooperate more:</p> <ul style="list-style-type: none"> - Inside your university? Why do you find this cooperation party important? - Outside university? Why do you find this partner important?
<p>MODULE 5: Assessment and feedback as a part of teaching and learning</p>	<p>Assessment, feedback and technology:</p> <p>A question for teachers:</p> <p>In what way you could improve your ways of evaluation and providing feedback to students by utilizing technology?</p> <p>Questions for instructional designers:</p> <p>a) What kind of tools for student assessment and feedback are there available in our university?</p> <p>b) What kind of new tools could there be?</p>
<p>MODULE 6: Modernization of teaching</p>	<p>Ways and forums for development</p> <p>a) Which are the most interesting seminars/courses your university is offering for staff in the near future? If you do not find suitable courses or events for you, what kind of events and other support there should be available for staff?</p> <p>b) What forums for cooperation in TEL are there in your university? What kind of new forums could there be?</p>



Dev. 2.1. UNITEL Training path



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