Webinar:
Academic Teaching Methods
20.06.2024.

(e)Learning Methodologies

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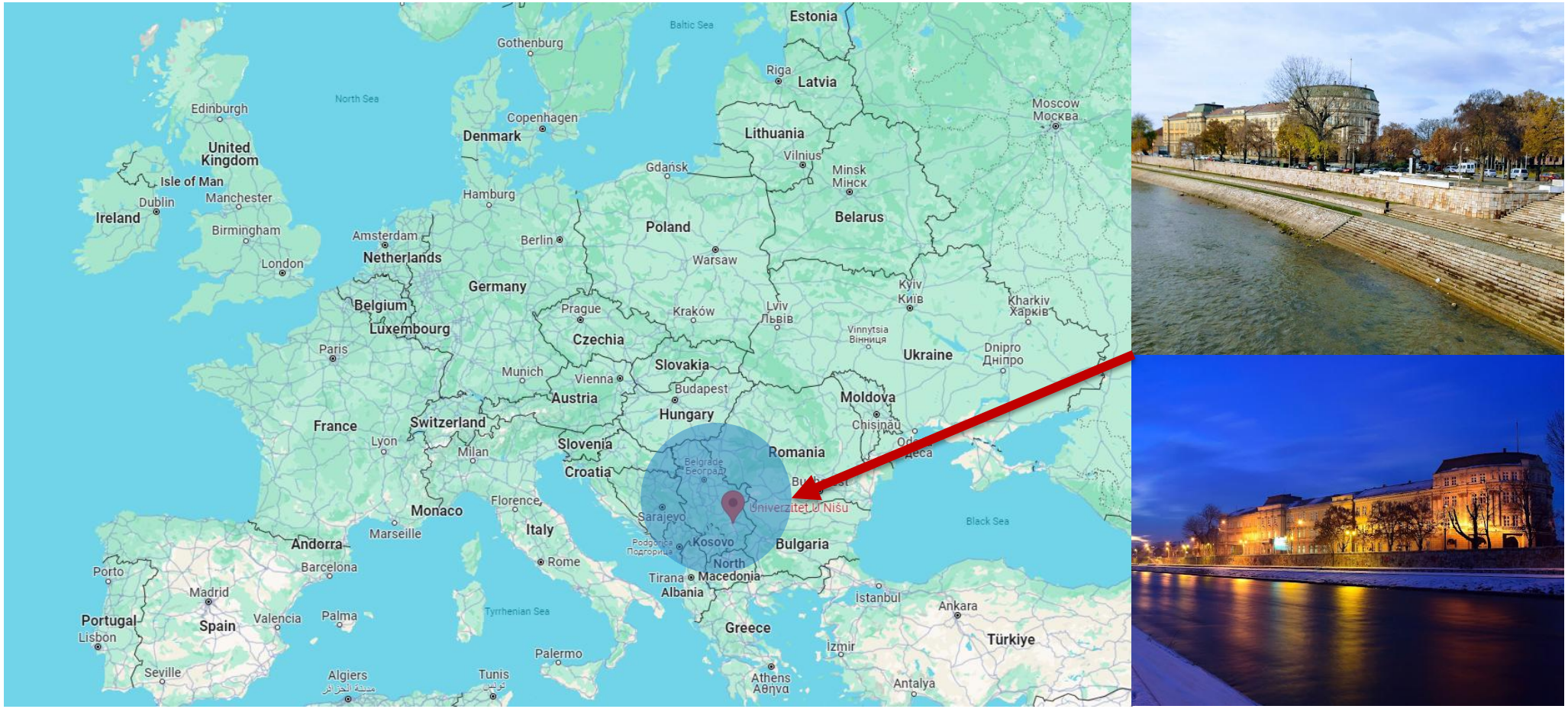
Something about us…



University of Niš
Faculty of Mechanical Engineering

Something about us…

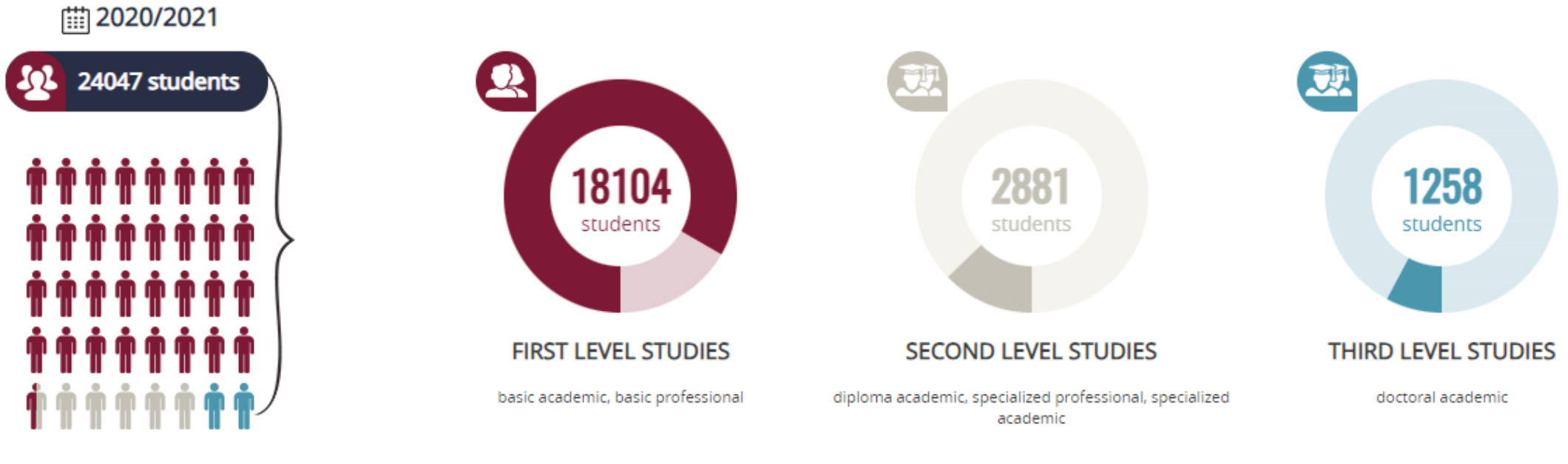
- **University of Niš, Serbia** - https://ni.ac.rs/

  From the University foundation until the academic year 2022/2023, 76.369 students have graduated from the University of Niš, 1.390 of them being foreign citizens, while 10.150 postgraduates acquired their master degrees and 2.689 candidates, including 115 foreigners, defended their doctoral dissertations. **University has 14 faculties.**

- **Faculty of Mechanical Engineering** - https://www.masfak.ni.ac.rs/

  Today, there are 1414 students at all levels of studies at the Faculty. Academic activities are conducted by a total of 99 professors and assistants, with additional 50 members of the non-teaching staff.

Something about us…UNI Info



University data and info - https://www.ni.ac.rs/en/student-info

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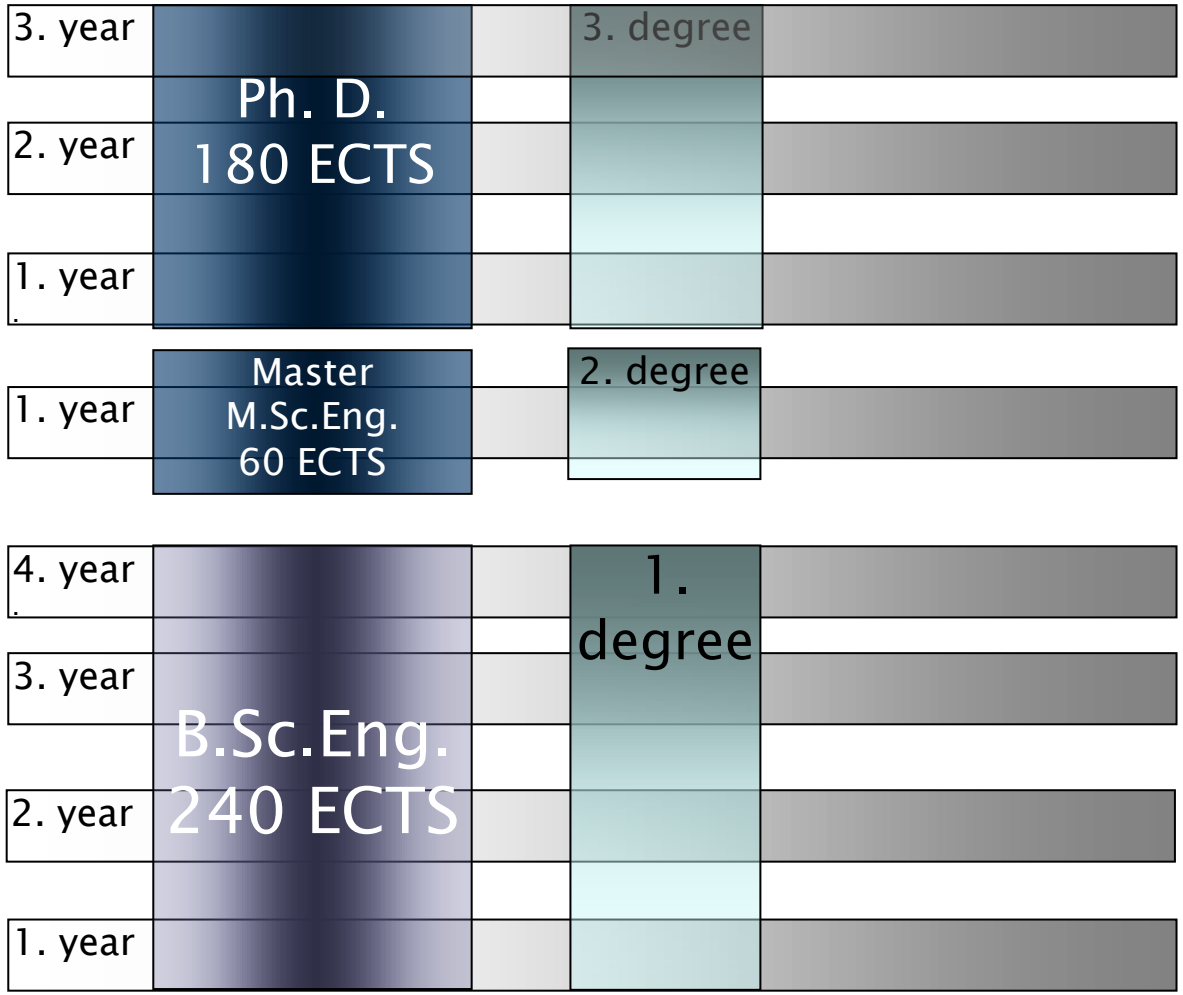
Something about us…MFN studies

Academic studies Mechanical Engineering



https://youtu.be/ZMyvgNQc96k

Go inside the Faculty...

Something about us…MFN Departments

Department of Natural and Mathematical Sciences

Department of Mechanics

Department of Thermal Engineering, Thermoenergetics, and Process Engineering

Department of Hydroenergetics

Department of Mechanical Constructions, Development, and Engineering

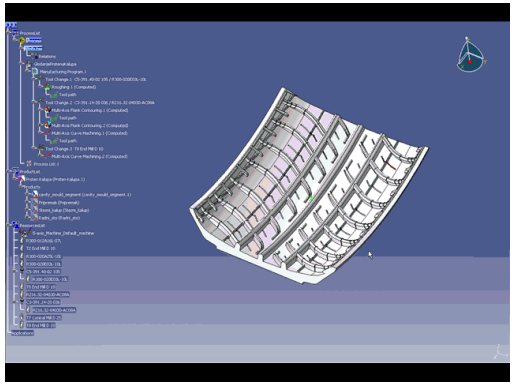
Department of Production Information Technologies

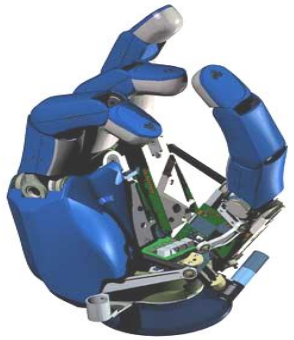
Department of Social Sciences

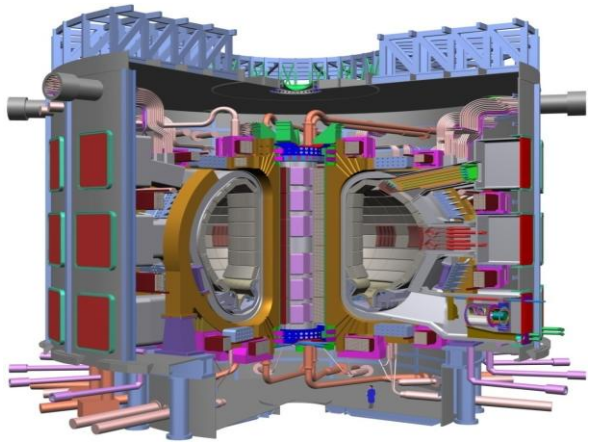
Department of Mechatronics and Control

Department of Transport Engineering and Logistics

Department of Management in Mechanical Engineering







Topics

- Teaching Methodologies in a Nutshell
- Atomic Learning as the ground-breaking methodology for eLearning
- The Virtual/Extended Reality and atomic learning – The future of Virtual Education
- Intelligent learning – Learn by using minimal effort

Presentation

a) Learning Theory in a Nutshell

b) Learning by simulation: Medical studies example

c) Content creation by using two platforms: Mentor and Atomic learning platform

d) Content creation by using Unity for VR

e) Discussion and What Next?

Webinar GOAL

To represent existing teaching methodologies in academia and to provide the foundation for the **education of the FUTURE**.

To educate, one must be ready to learn!

INTRODUCTION TO WEBINAR

Due to the complex and demanding nature of academic studies, interested individuals should possess certain character traits and complete their education **before beginning to work in the field.**

They need to learn how to learn and how to use "what is there" during and after the studies!

INTRODUCTION TO WEBINAR

INFORMED

EDUCATED

CONNECTED

Students and teachers must be constantly informed of newly developed methods in the specific fields of interest**, properly educated,** and **widely connected** in order to exchange knowledge. This is the basis for the proper implementation of the educational processes.

INTRODUCTION TO WEBINAR

Just in time introduction to the novel educational methodologies

Proper application in **education and training** is essential for the successful implementation of academic studies.

Connection and collaboration between scientists, students, and teachers together with industrial engineers are vital to properly acquire the required knowledge and to implement and develop skills and capabilities

INTRODUCTION TO WEBINAR

The outcome aims to thoroughly introduce and possibly improve the **teaching process of academic studies.**

The application of novel educational methodologies, augmented reality, simulation, 3D geometrical and mechanical/electrical/physical modeling, as well as e-learning, m-learning, distance, and blended approaches, will be in focus **and the backbone of the teaching methodology enhancements.**

Teaching Methodologies

Nowdays, two general approaches exist in designing web-based education systems with Open Online Courses (OOC): **adaptive education systems** and **intelligent tutoring systems** [Cem Tekin, eTutor: Online Learning for Personalized Education, 2014; M. Venu Gopalachari, Personalized Context Aware Assignment Recommendations in E-Learning System, 2016].

Teaching Methodologies

Main shortcomings of today's approaches in e/Learning are: **missing or inadequate feedback from the students**, **system adaptation not focused on learning context**, and **course presentation** (learning material) limited to one teaching style.

Beside stated advantages and disadvantages to eLearning methods, there are practical shortcomings which are important to address, like**: they are weekly adoptable to students with disabilities; they are not suitable for groups with different knowledge background and cognitive capabilities; they are poorly customizable to immersive business demands**, etc.

TM - Adaptive education systems

Adaptive learning is a technique that uses data-driven instruction to adjust and tailor learning experiences to meet each student's individual needs.

Adaptive learning systems can track student progress, engagement, and performance and use the data to provide personalized learning experiences.

TM - Adaptive education systems

In an adaptive education system, the teaching materials are adapted based on the student's preferences, but usually not based on the feedback the student provides during the course

[Hayder Murad, Personalized E-Learning Recommender System using Multimedia Data, 2017].

This adaptation is based on numerous preferences, including the student's learning style, knowledge, background, origin, grades, and previously taken courses.

TM - Intelligent tutoring systems

In an intelligent tutoring system, adaptation is performed based on the student's response to the presented teaching material without considering contexts.

However, combining both ideas (adaptive and intelligent) is possible by adapting the sequence of teaching materials presented to a student based on both the context and the student's feedback.

For the success of these methods, it is essential to include student(s) actively and to properly analyze their answers.

TM – Adaptive and Intelligent

It is necessary to mention that there are various definitions, combinations, and integrations of these educational systems, and it is often hard to separate them.

Adaptive learning, in general, is part of interactive and intelligent learning that addresses the needs of individuals through learning pathways, effective feedback, and supplemental resources, as opposed to a one-size-fits-all curriculum

https://www.montclair.edu/itds/digital-pedagogy/pedagogical-strategies-and-practices/

TM - Case-Based Teaching

Case-based teaching strategies use real-life examples to offer a shared learning experience. It may be difficult for students to experience real-world situations together.

These scenarios, provide a common “experience” so that students can solve problems, make decisions, and generally think critically together. Many case studies are stories, designed to engage students in research and analysis of a specific problem or set of problems. Case studies tend to work well in the online/hybrid learning environment.

TM – Experiential Learning

Experiential learning prioritizes learning through direct experience, such as internships, fieldwork, and service-learning projects.

By immersing students in real-world scenarios, they can practically apply their knowledge and skills.

A major advantage of this approach is its ability to connect theoretical concepts with practical application, helping students grasp the significance of their learning and cultivate skills directly relevant to their future careers.

TM - Gamification

Gamification employs game elements like points, badges, and leaderboards to stimulate and involve students, making learning more engaging across various subjects.

It particularly excels in enhancing student participation in subjects that are typically perceived as less captivating.

A significant advantage of gamification lies in its ability to boost student motivation and involvement. Integrating these game elements into education encourages students to become more invested in their learning journey and assume a proactive role in their academic progress.

TM - Flipped Learning

Flipped learning reverses the conventional classroom structure by having students watch lectures or read materials before class, and then using class time for hands-on activities and discussions.

This approach offers personalized and interactive learning opportunities. By utilizing class time for interactive engagement and peer interaction, flipped learning enables students to delve deeper into the course content and receive valuable feedback and guidance from both peers and instructors.

TM - STEM

STEM is an acronym for science, technology, engineering, and math. These four fields share an emphasis on innovation, problem-solving, and critical thinking. Together, they make up a popular and fast-growing industry in education.

STEM comprises the following major areas of study (not limited to):

- Natural, physical, and life sciences (sometimes including medicine)
- Computer, electronics, and other technology-related disciplines
- All types of engineering
- Mathematics, or any field involving a heavy application of mathematical principles

TM - STEM

STEM is an approach to learning and development that integrates the areas of science, technology, engineering and mathematics.

Through STEM, students develop key skills including:

problem solving

creativity

critical analysis

teamwork

independent thinking

initiative

communication

digital literacy.

TM – STEM – JOBS

Salary & Job Outlook for Popular STEM Careers		
Job	**Median Salary (May 2021)**	**Job Growth Rate (2021-31)**
Physicists and Astronomers	$147,450	8%
Computer Hardware Engineers	$128,170	5%
Software Developers	$109,020	25%
Chemical Engineers	$105,550	14%
Database Administrators	$101,000	9%
Computer Systems Analysts	$99,270	9%
Mathematicians and Statisticians	$96,280	31%
Industrial Engineers	$95,300	10%
Architects	$80,180	3%
Web Developers	$78,300	23%

The U.S. Bureau of Labor Statistics (BLS)

TM - References

- Essa, Saadia Gutta, Turgay Celik, and Nadia Emelia Human-Hendricks. "Personalized adaptive learning technologies based on machine learning techniques to identify learning styles: A systematic literature review." IEEE Access 11 (2023): 48392-48409.
- Wang, Shuai, et al. "When adaptive learning is effective learning: comparison of an adaptive learning system to teacher-led instruction." Interactive Learning Environments 31.2 (2023): 793-803.
- Gavilanes-Sagnay, Fredy, et al. "A systematic review of ill-defined problems in the intelligent tutoring systems in virtual learning environments." International Journal of Intelligent Systems and Applications in Engineering 11.5s (2023): 220-228.
- Raviolo, Paolo, et al. "E-tutoring layout in higher education: skills and efficacy perception." Research on Education and Media 15.1 (2023): 80-87.

Teaching Methodologies - Question?

The important question is: "**How to create a sustainable learning system that will be tailored according to the requirements of the specific student (person) or domain of work (business) and education, but which will also provide general and certified knowledge, and, work-based and lifelong learning**?".

Teaching Methodologies – Broad Goals

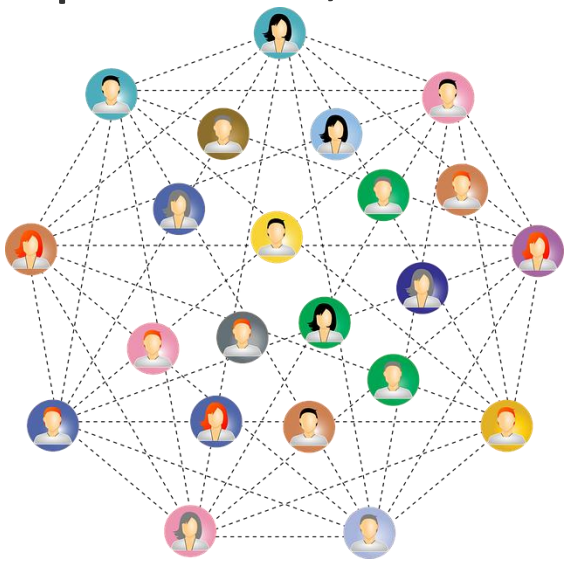
Learning system that will always provide contemporary content

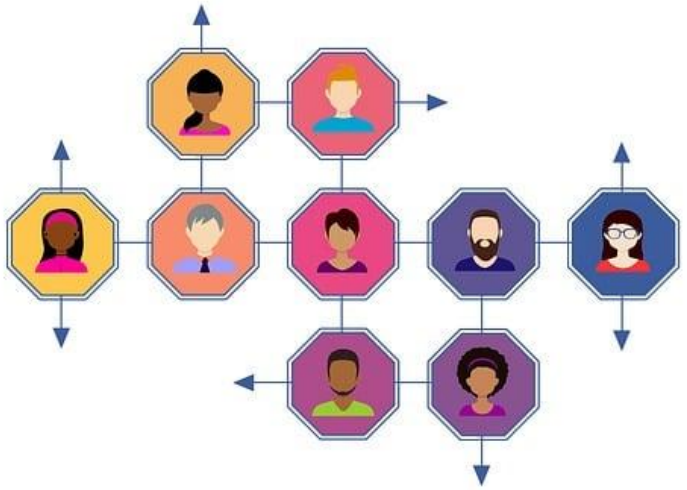
A learning platform that is able to adapt to the specific needs of educational institutions, companies, public institutions, and organizations.

Different types of learning (Project-based learning, Work-based learning) will enable students to learn by using different kinds of courses developed by **Academia, SMEs, and enterprises**, which can be performed online by using a web platform or by learning on the physical site.

Teaching Methodologies – Integration

Connection and collaboration between scientists, engineers, teachers, and students are vital for adequately acquiring and developing new capabilities, skills and knowledge.





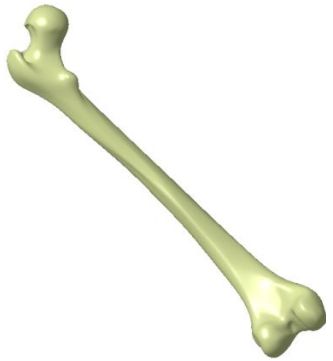
Teaching Methodologies

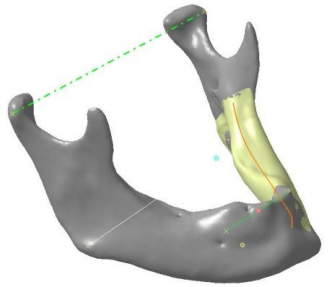
The new paradigm is introduced – **Personalized Learning**

To focus learning processes to the requirements of the individual STUDENT

Learn by networking - Case based

Modelling for education



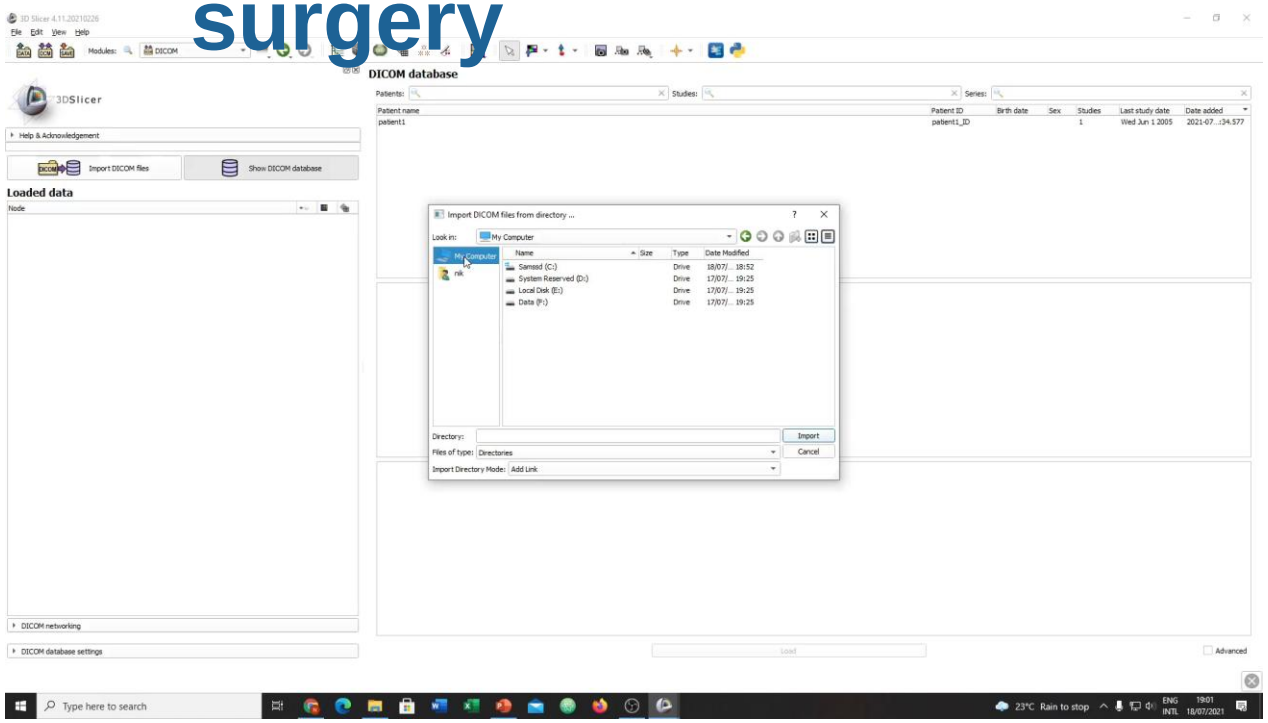


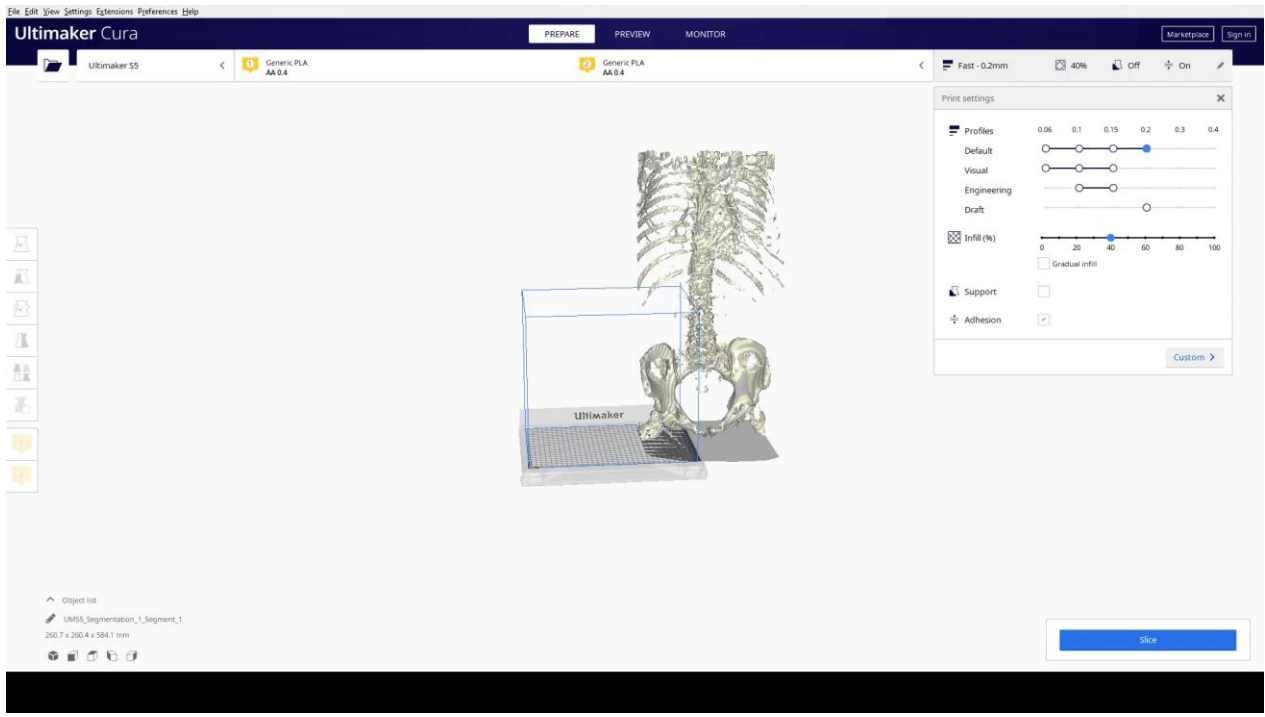
Crating models used for anatomy learning – Atomic 3D polygonal models

Models developed in 3D Slicer, Catia and Blender

Learn by networking - Case based

Imagine you are a medical student – Orthopedic surgery

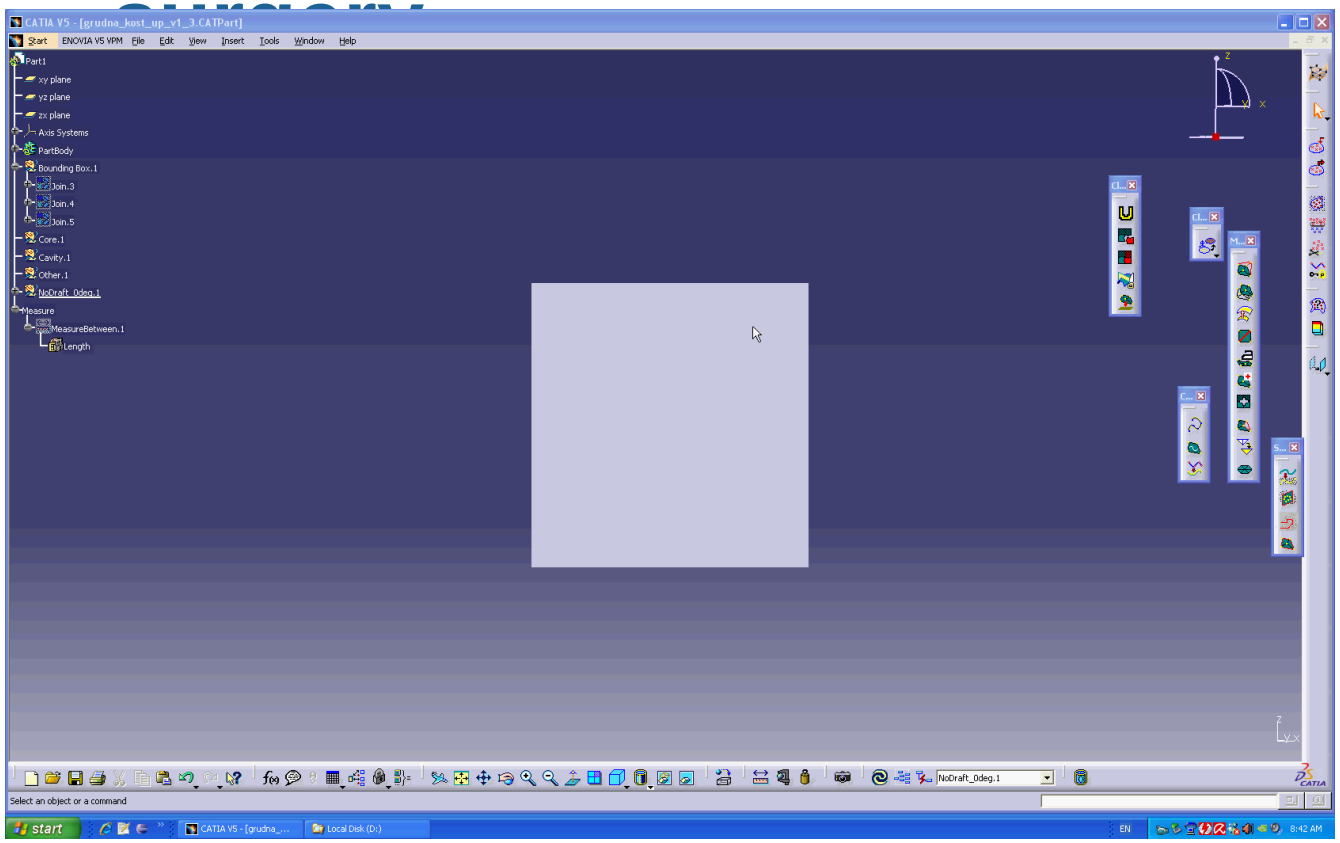




From CT to 3D Printing

Learn by networking – Case based

Imagine you are a medical student – Orthopedic surgery



From CT to 3D model

How to place fixator

TM – Novel Educational Methodology

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Novel Educational Methodology (NEM) initially developed by the Faculty of Mechanical Engineering, University of Nis, Serbia

Enables creation and implementation of **open personalized courses and courses with customized content for education, innovation, and business (knowledge triangle).**

TM – Novel Educational Methodology

The new approach is to create flexible teaching materials in courses oriented toward virtualization of biological, mechanical, and related systems by using different learning methods, specifically **atomic learning (small units of educational material—similar to adaptive learning and "First Principle" theory)**.

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TM – Novel Educational Methodology

NEM enables the **creation and application** of standard eLearning content (**context-based learning, feedback-based learning, and adaptable learning**)

and introduces new learning methods and approaches **in university and business educational processes**, e.g., work-based learning, long-life learning, and long-term learning.

TM – Novel Educational Methodology

NEM is based on three primary eLearning methodologies:

Molecule-Based Learning (MBL) - This technique is based on how learning content is presented to the learner. It introduces molecules of knowledge. It is based on the nucleus eLearning technique (set of microlearning material)

Smart-sEquence Learning (SEL) - Sequence learning is a known technique, and it presumes learning processes where basic elements of learning material are presented to the learner in a defined order.

Intelligent Content Creation (ICC) - Learning material can be in various forms, and the most common forms are video material and text. This material is created during course creation, and it is fixed

NEM extends these methodologies

TN – NEM – Knowledge representation

The HEIs educational requirements are vast, but teaching methodologies in HEIs are usually oriented **to professor's preferences**, with little or no guidelines or established procedures, and there is a need to define educational approach or methodology **which will be synergy of knowledge, competences, and skills form different educational actors**, and properly defined, sustainable, student oriented and innovative.

“We teach, but how should we present it to the trainee?”

TN – NEM – Knowledge representation

“We teach, but how should we present it to the trainee?”

We add a psychological-pedagogical approach to the learning process – We adapt the explanation to the learning capabilities of the student by adding known “methodology” guidance.

TN – NEM – Knowledge representation

The main motivation is to improve **NEM** by defining and applying **University Teaching Methodology (U-TEAM)** based on using, adopting, and integrating teaching and learning methodologies from different fields, i.e., technical vs. philology and social and human studies.

During the previous period of **more than twenty years** educators from HEIs determined that there is no educational methodology which covers different teaching and learning requirements from various science fields.

TN – NEM – Knowledge representation

The human sciences study programs include **"methodology"** as mandatory subject which covers learning approaches and techniques applied in elementary and secondary education, but also applicable to higher education.

There is also an attempt to include STEAM approach to learning by adding "Art" to mainly technical STEM (Science, Technology, Engineering and Math) education policy, or by adding "E" for Economics (STEEM), thus making different educational variations.

TN – NEM – Knowledge representation

The technical sciences on the other hand do not include, or include in a very limited capacity, the educational "methodology" in study programs. The STEM is usually included, but with personalized approach, which usually reflects teacher's preferences.

For both technical, philology, social, economic, human, and other fields, the HEIs teaching methodology is generally defined by Teachers, rarely tailored to the student needs, and not directed by universal or standardised guidelines!

TN – NEM – Knowledge representation

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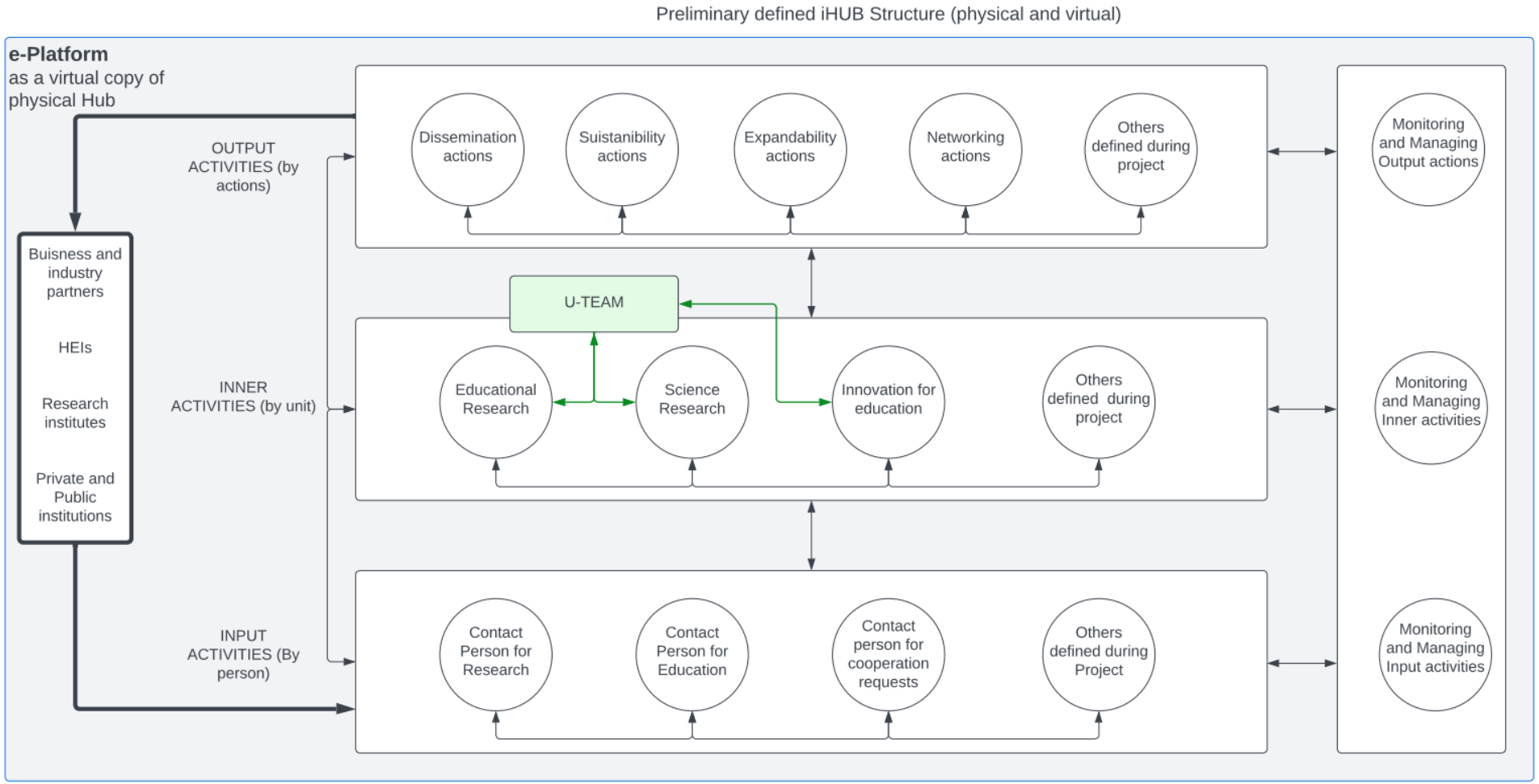
The U-TEAM methodology under NEM should provide a contemporary answer to the HEIs education stated issues, I.e., it **should bring universal methodology which will enable proper learning pathways in HEIs education for different science fields.** It will represent a functional and highly innovative synergy of different teaching approaches and methodologies aimed to bring better education for students and teachers.

TN – NEM – Knowledge representation

"How to make it work? How to enable constant upgrade, functional adaptability, tailor contented and lifelong learning for HEIs?".

The answer are innovative iHUBs as part of existing educational centres in HEIs. These hubs will provide physical support to the U-TEAM methodology and enable cooperation and knowledge exchange between HEIs and other institutions from public and private sectors.

TN – NEM – Knowledge representation



TM – Novel Educational Methodology

Molecule-Based Learning (MBL) - Improvement

Knowledge Molecules contain one or more variants of the same nucleuses, i.e. they contain different variants of content explanations. One molecule can contain one or more nucleuses, and each of them can be applied individually, or combined.

To further upgrade this method, we substitute nucleuses with atoms, thus we add more layers (like electron levels) which can additionally explain content in the nucleus, and therefore we create atomic knowledge integrated into molecule (complex knowledge).

Learning processes can be adapted to the various target groups, like learners, learning subjects, learning domains, and goals.

TM – Novel Educational Methodology

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Smart-sEquence Learning (SEL) - Improvement

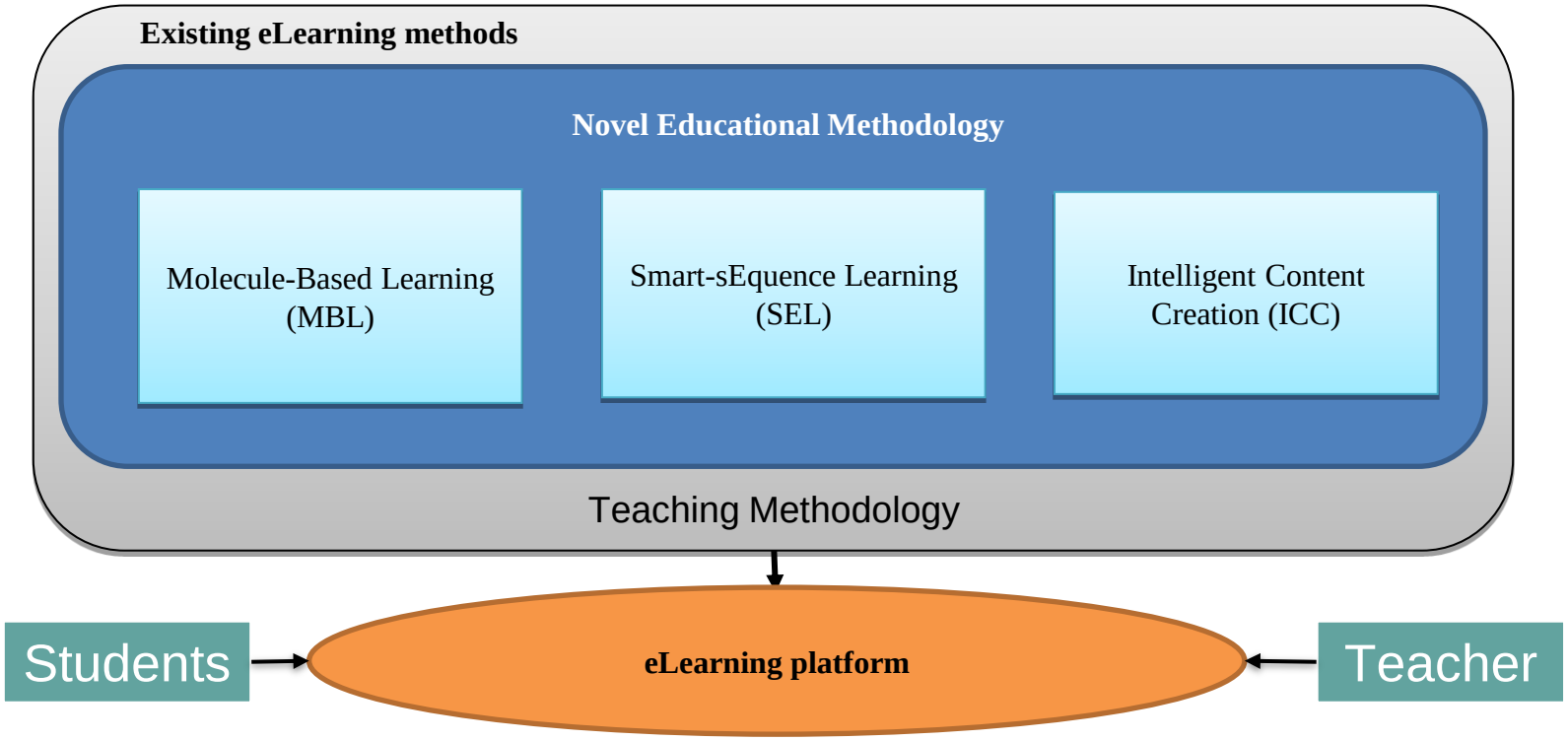
In NEM complete learning material is created by combining molecules of knowledge and their content in a personalized sequence. Learning sequence can be created by aggregating molecule from different domains, thus creating new courses by using material already implemented in existing courses. New courses can be created automatically or semi automatically by using AI methods, and/or by manually choosing learning material.

TM – Novel Educational Methodology

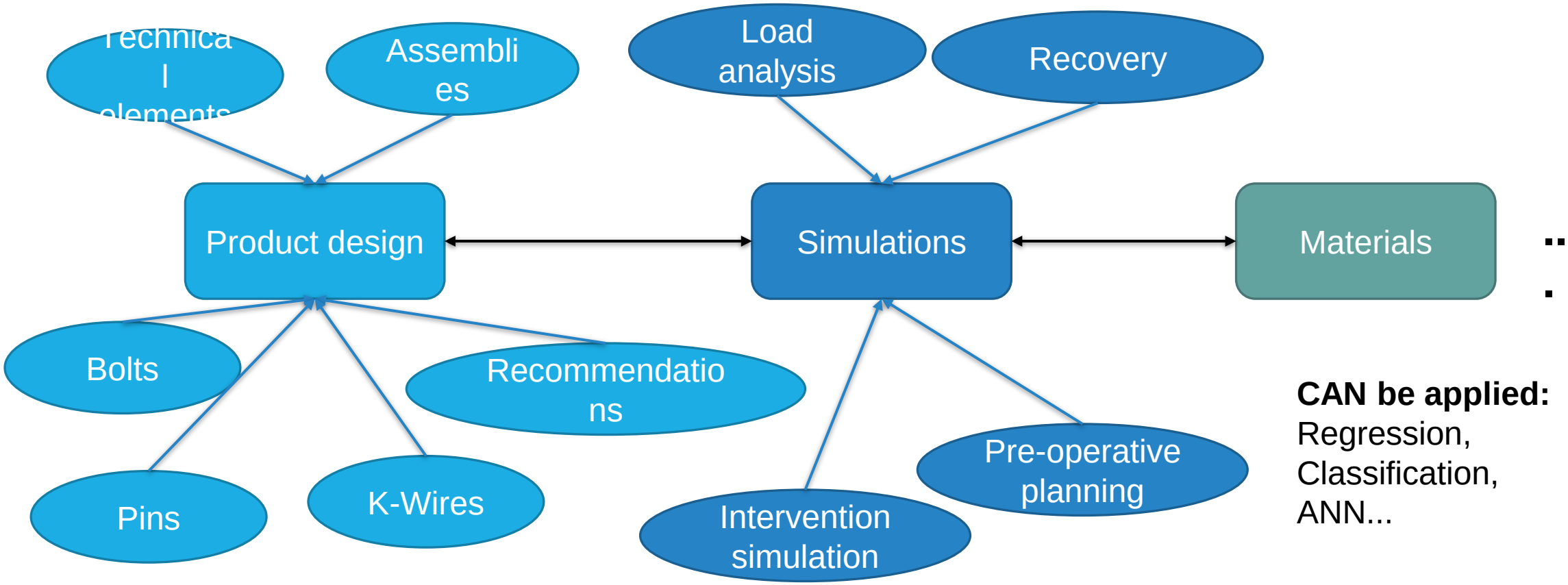
Intelligent Content Creation (ICC) - Improvement

This material is created during course creation, and it is fixed. In NEM, even on a micro level, video material and text can be formed based on the personal preferences of a learner and a teacher. This is possible due to the application of the digital avatar for the teacher, and by using semantic interpretation of the learning material, i.e. by using ontologies, and Natural Language Processing (NLP) techniques.

TM – Novel Educational Methodology



TM – Novel Educational Methodology



CAN be applied:
Regression,
Classification,
ANN...

TM – Novel Educational Methodology

COURSE DESCRIPTION:

A course is a complex object made up of a series of atoms (such as a machine assembly, which consists of machine elements), and its basic structure.

Atoms are made up of software and/or digital elements of different types.

The main visuals are digital objects created in specific graphics software, and represented by 2D or 3D representation (e.g. gearbox, medical implant, patient's bone)

Atoms may also be sound and some other representation of knowledge, such as an audio recording explaining the functioning of a implant system, and these elements support the main elements.

TM – Novel Educational Methodology

COURSE DESCRIPTION:

Atoms are assembled into molecules and define certain complex elements. Possible examples:

- An audio recording in which the author explains some activity
- VR application that simulates the orthopedic surgical intervention, using appropriate hardware (e.g., Google cardboard)
- A business system that comprises multiple processes, i.e., elements organized into groups.

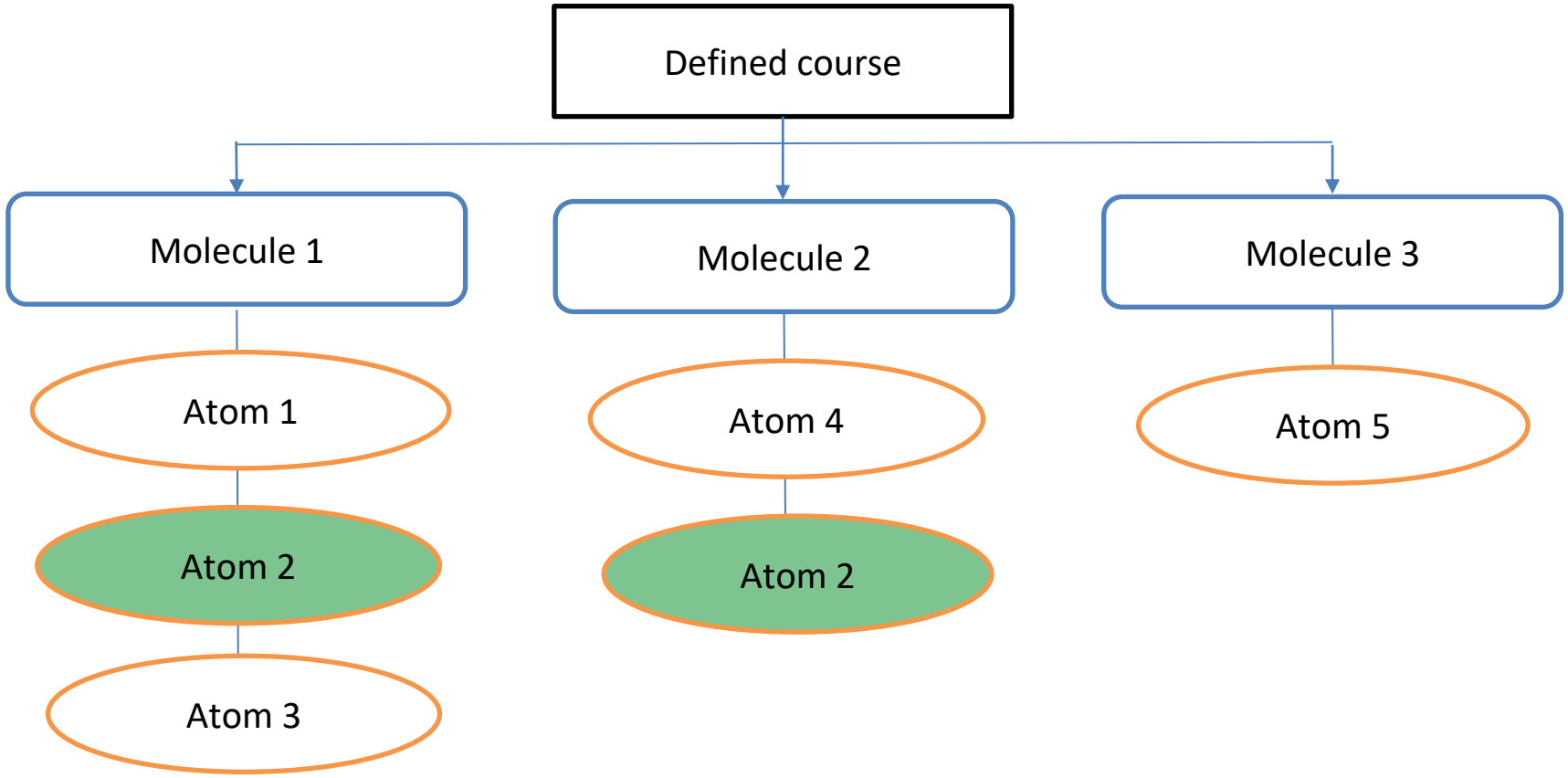
TM – Novel Educational Methodology

COURSE DESCRIPTION:

Individual atoms can be combined into a set of several molecules that define the course.

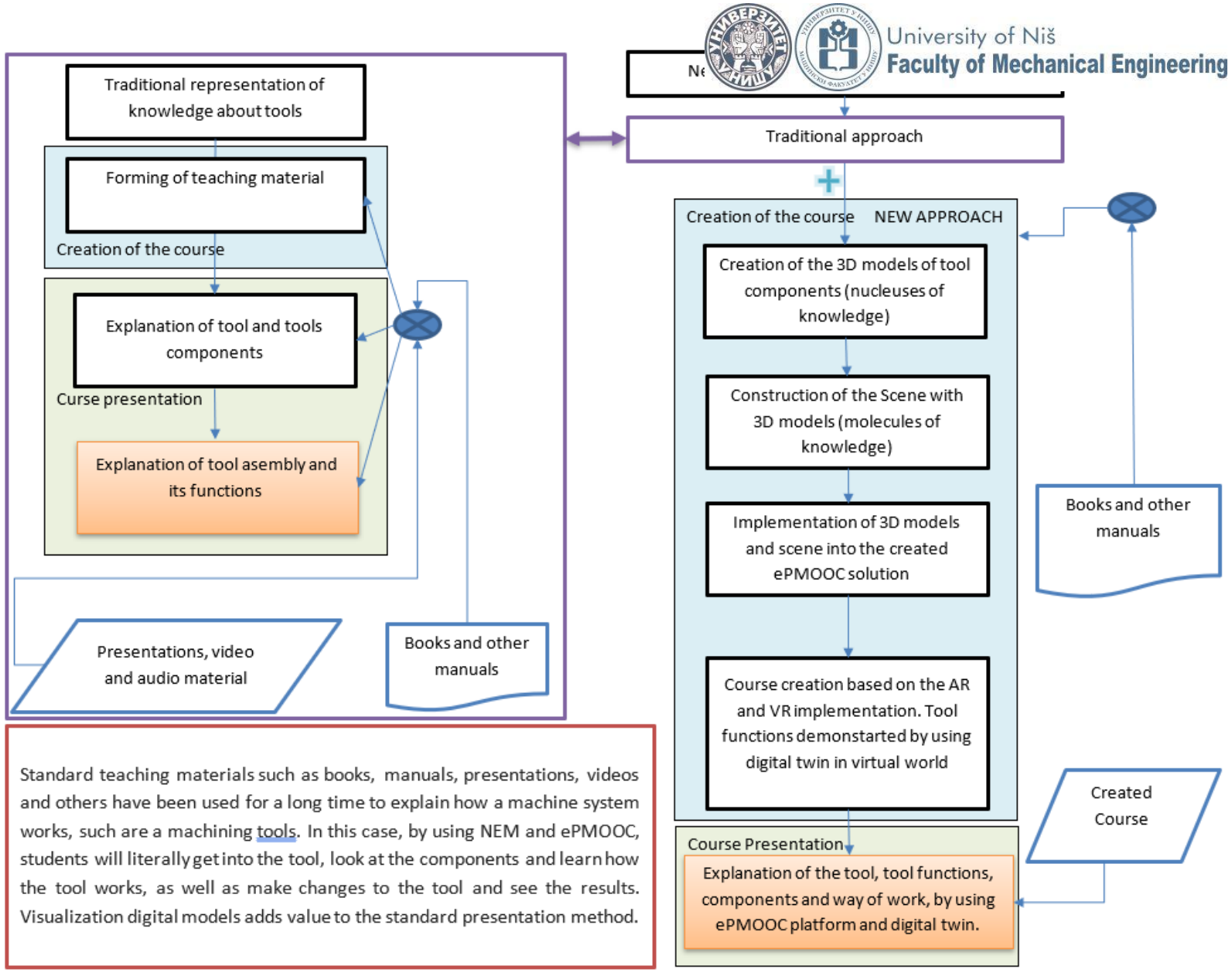
The true power of the course lies in your hands. **You** have the flexibility to combine different atoms, either by manual selection or by leveraging the power of machine learning algorithms.

TM – Novel Educational Methodology



COURSE EXAMPLE

Comparison of traditional VS. **Novel Educational Method** supported Course in mechanical engineering



COURSE EXAMPLE

A traditional machine tool course consists of images/drawings of the tool assemblies and tool components, which are presented to the learner and explained.

Educational experience gained **through teaching over the last twenty years** shows that it is of great importance to provide some kind of visualization of the tools, tool components, and tooling processes. The **students must be informed of each tool component, its function, and possible applications** beyond current tools and assemblies.

COURSE EXAMPLE

One bolt which can be used for the fixation of the tool, can also be used for many other applications (in this tool, or completely different application), and its explanation and function demonstration is essential for the understanding of the whole tool assembly.

This simple bolt is an essential element for creating an explanation of the atom.

Another element could be a nut, which usually goes with the bolt but not always, which depends on the application. **Nut can also be described by unique atoms**, but additional atoms can be added if there is a requirement.

COURSE EXAMPLE

Author of the course can create 3D model of the bolt (first nucleus), add audio explanation (second nucleus), add textual explanation (third nucleus), and add everything which he finds appropriate, and form molecule of knowledge.

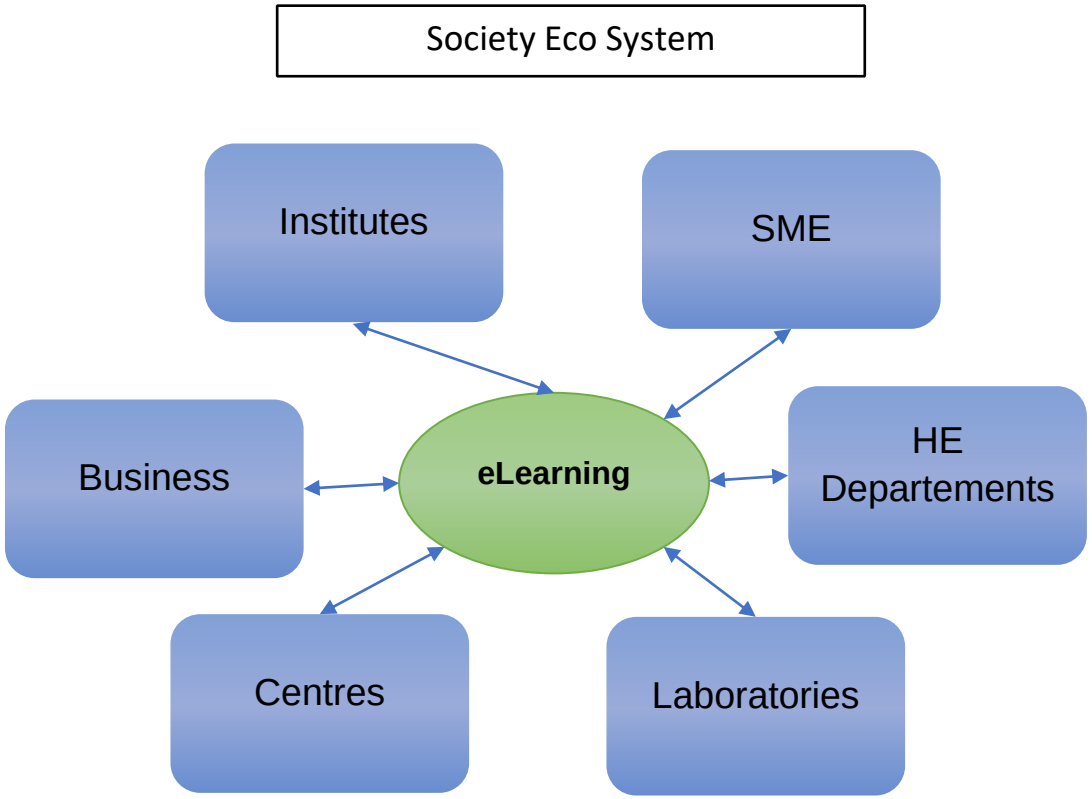
After everything has been created, the author can create a VR or AR simulation and add all 3D models with an attached audio explanation.

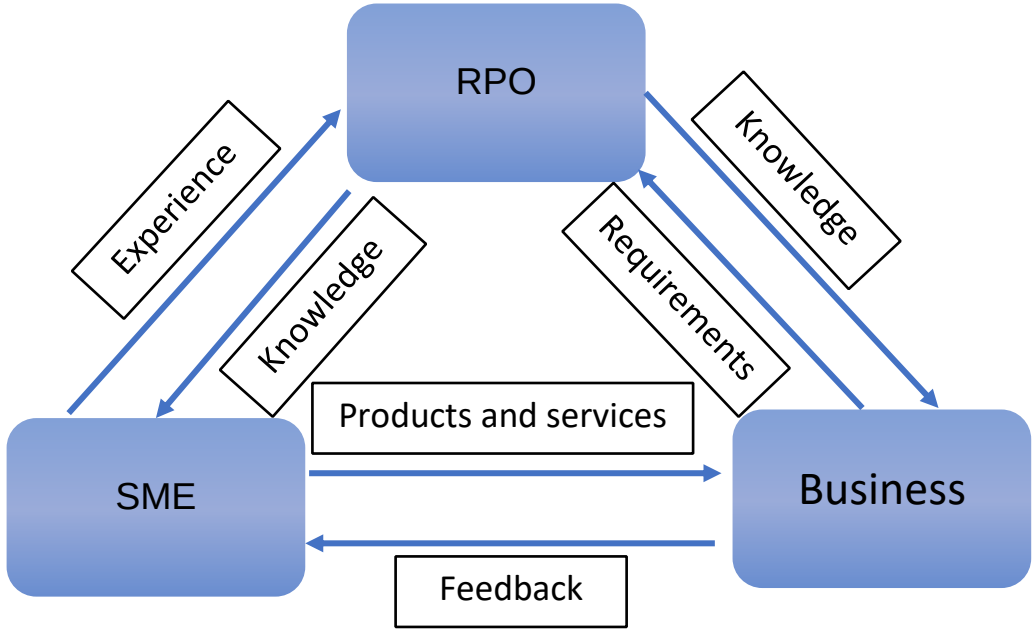
The web platform can be used to apply the created educational material

TN - APPLICATION

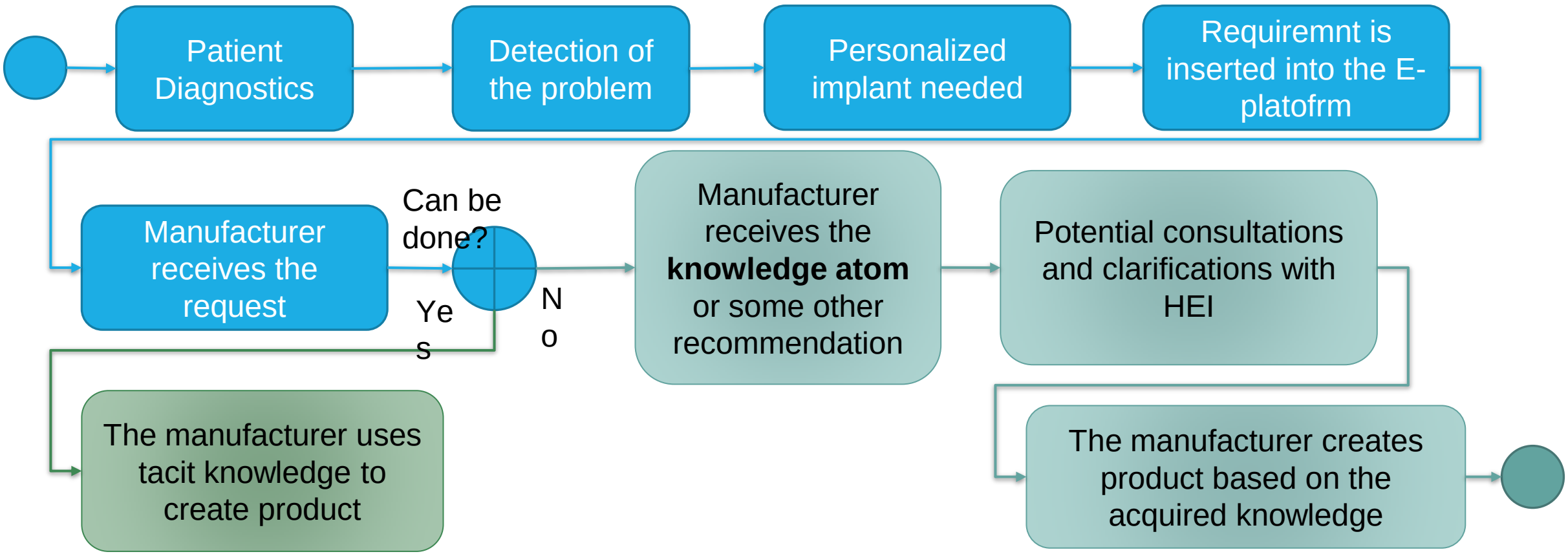
The NEM and STEM are "applied" in an open e-platform for collaboration and knowledge exchange, which enables the application of **different teaching methodologies**, enhancement of existing Higher Education curriculums, and creation of innovative personalized content products.

TN – APPLICATION - Learning with GOAL?

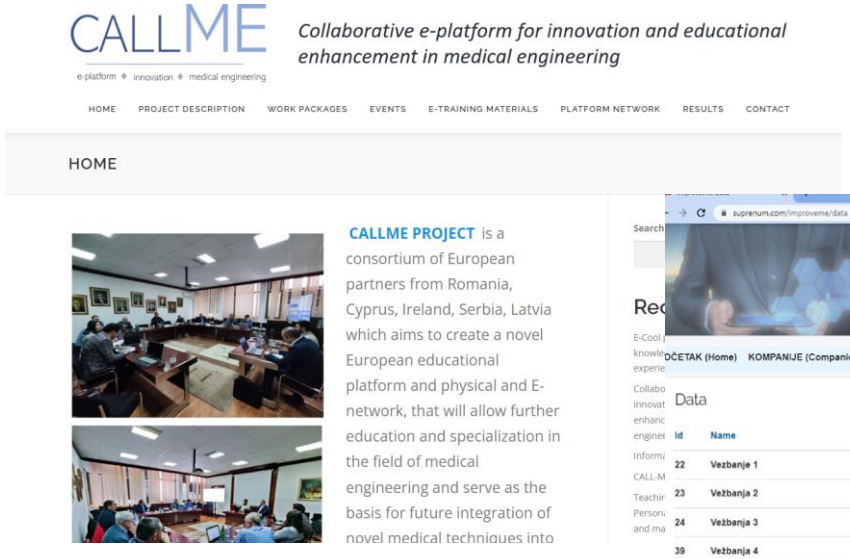




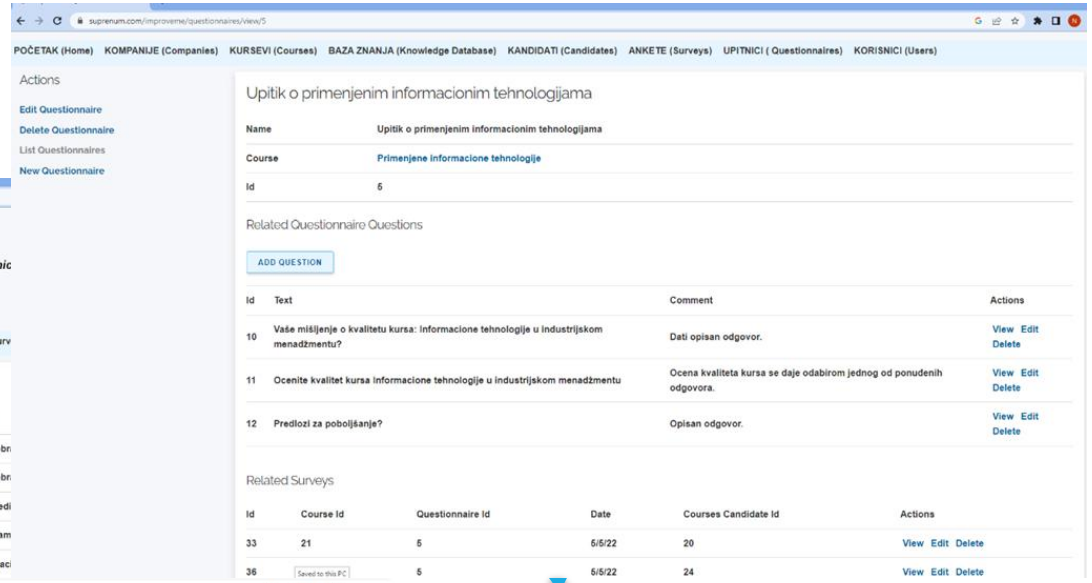
TN – APPLICATION - HEALTHCARE



eLearning Platform demonstration



CALLME Erasmus+ project



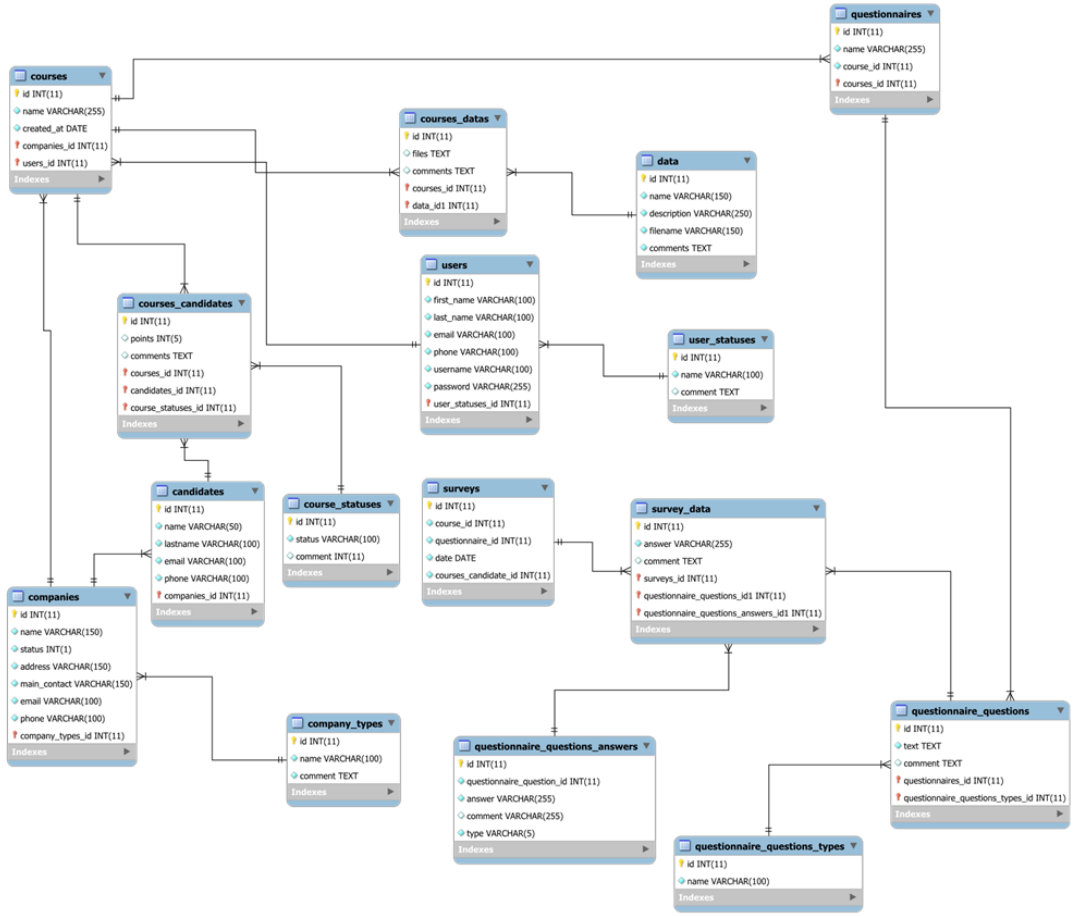
Knowledge Database

Questionnaires

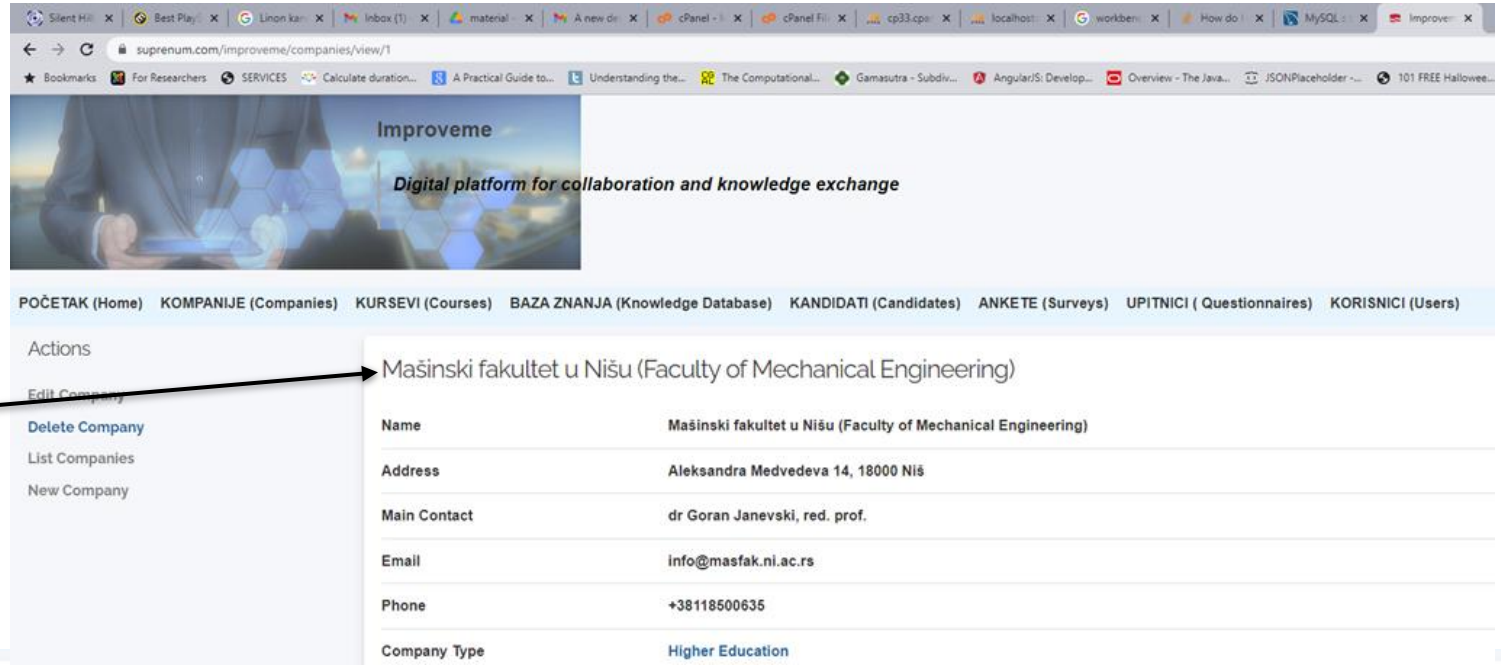
DATABASE APPLICATION IN .NET – DATABASE STRUCTURE – DATA MODEL

Main tables:

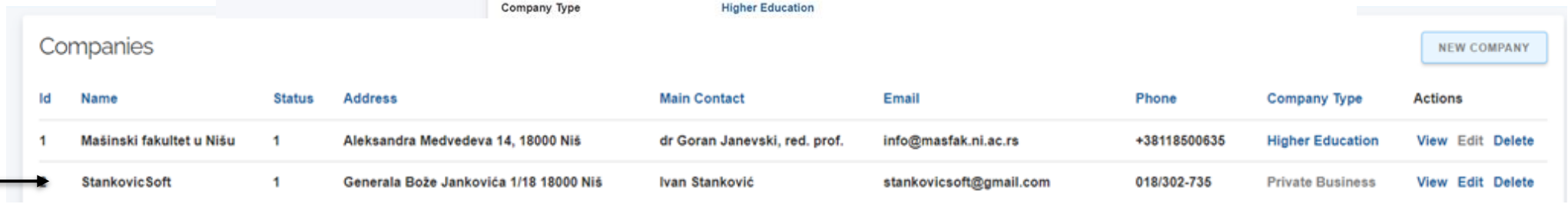
- **Users** – Users of the system
- **Companies** – Business, Innovation, and HEI
- **Candidates** – For taking courses
- **Courses** – Courses based on data
- **Questionnaires** – User defined questennaries
- **Surveys** – User-defined surveys
- **Data** – **Atoms of knowledge**



eLearning Platform application



HEI

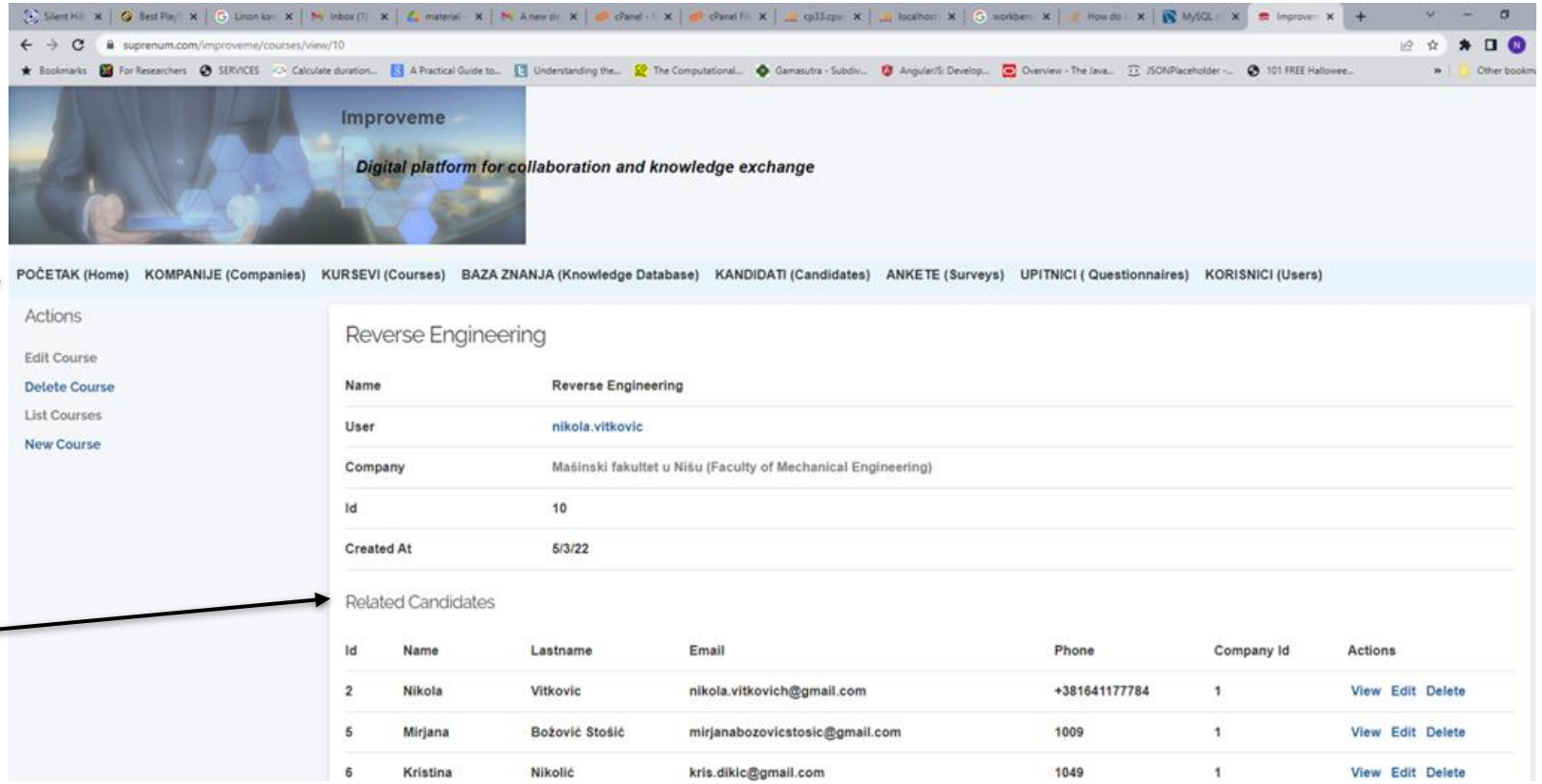


COMPANY

eLearning Platform application

COURSE

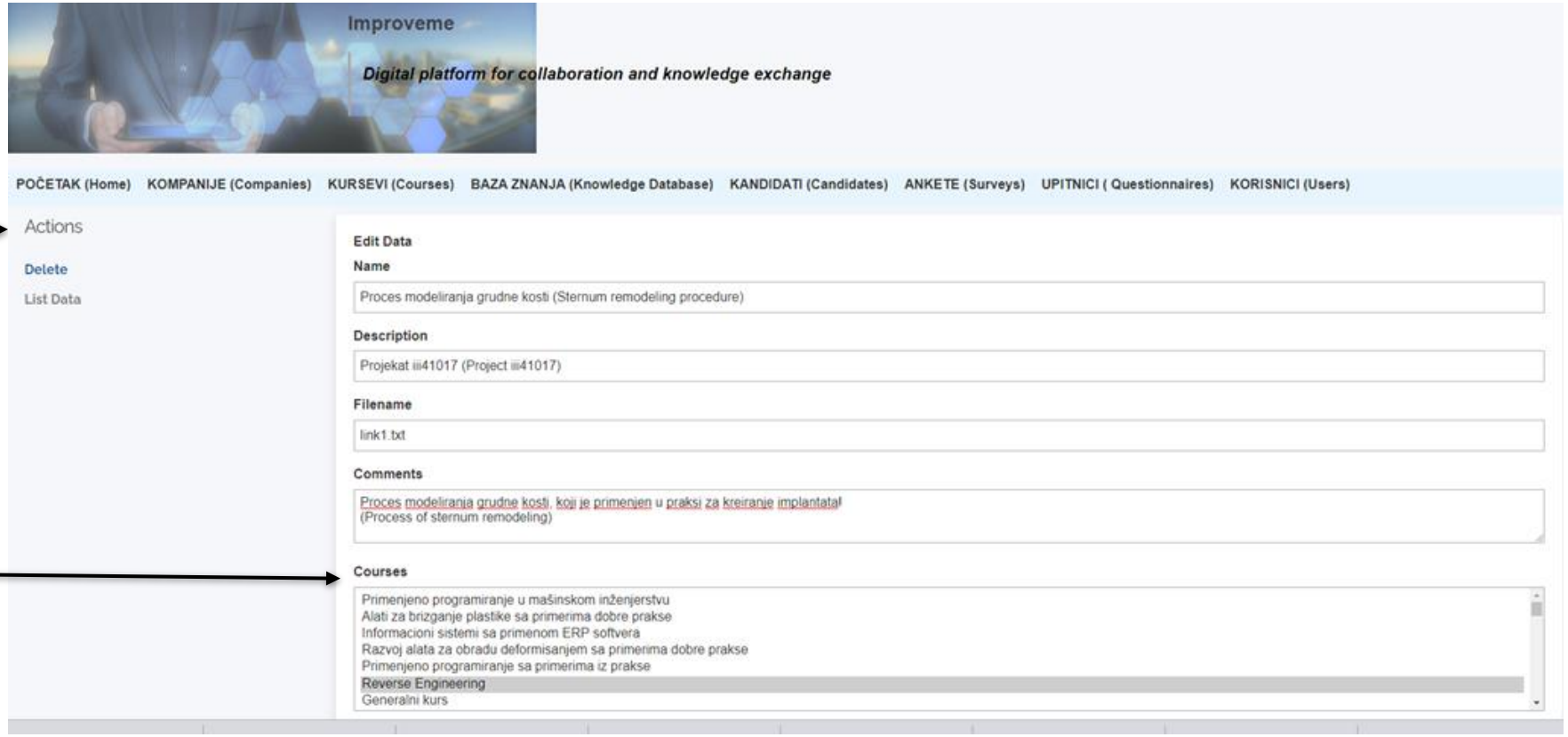
CANDIDATES



eLearning Platform application

DATA

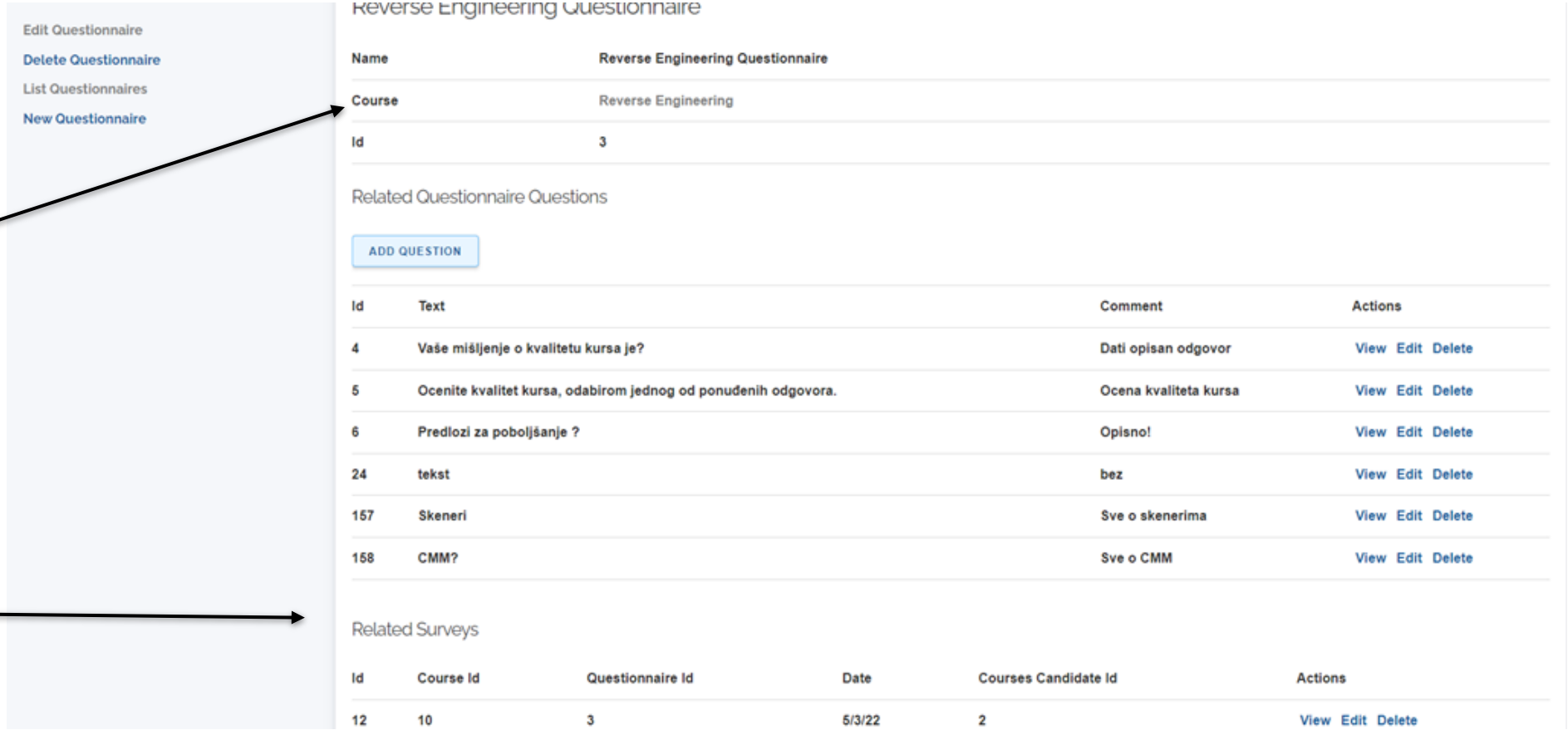
COURSES



eLearning Platform application

Curse Questionnaire

Survey for questionnaire

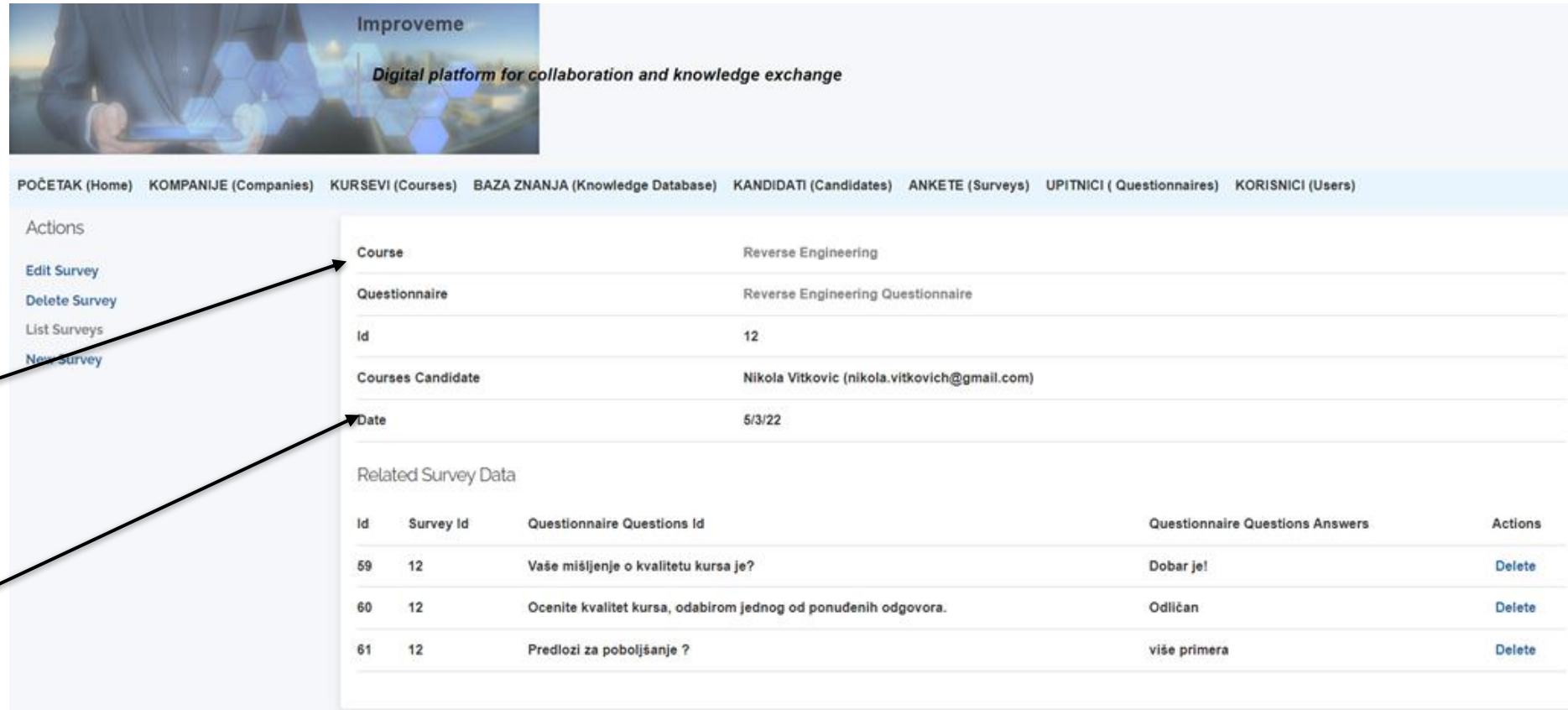


eLearning Platform application

https://www.suprenum.com/callmeed

Curse Survey/Questionnaire

Survey for questionnaire



eLearning Platform application

To Do:

- **Create learning material – Atoms of Knowledge**
- **Create the Course(s)**
- **Connect atoms to the course – Smart content**
- **Create Surveys**
- **Evaluate and upgrade**

eLearning Virtual Mentoring

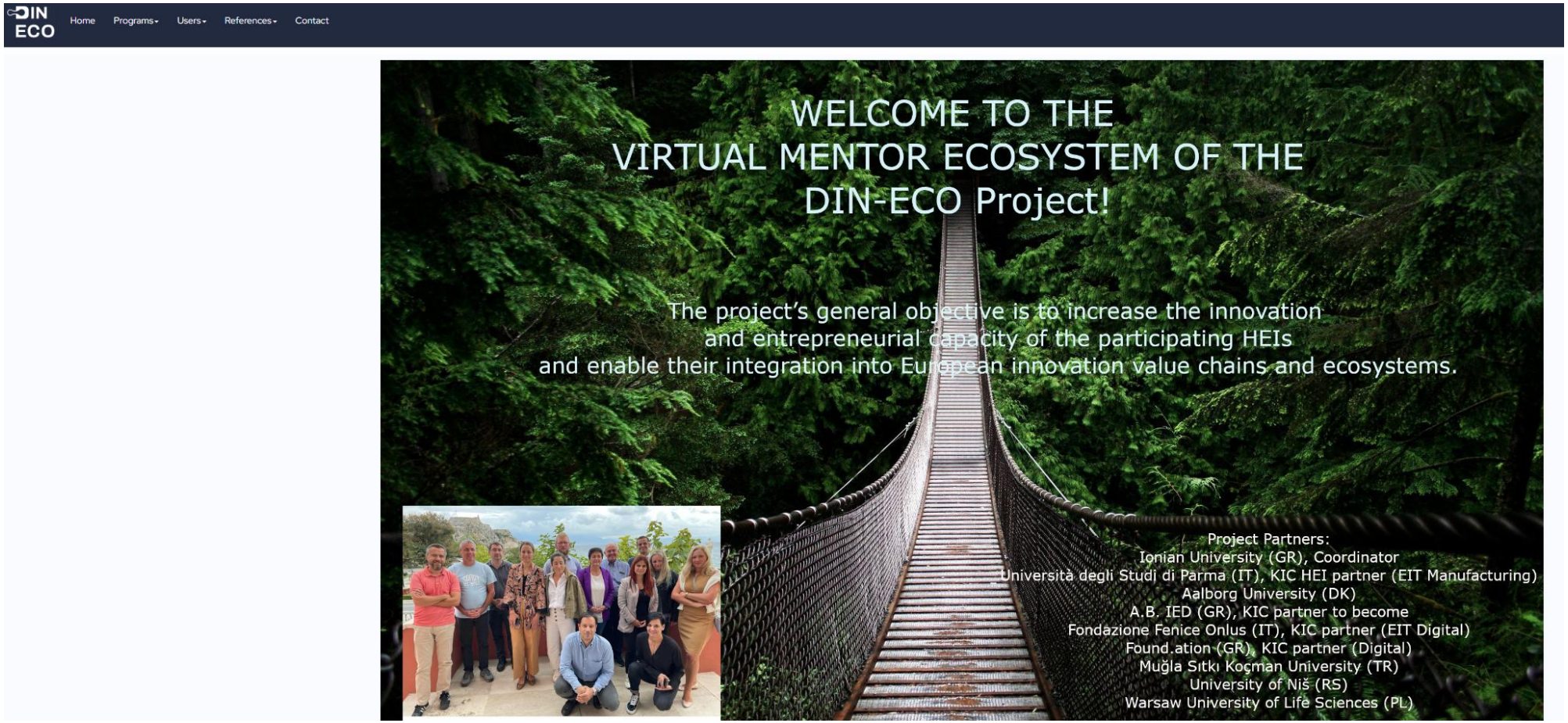
The platform for virtual Mentoring - http://vmentors.din-eco.eu/

As a part of Din-ECO Project https://din-eco.eu/

Platform enables different communication channels for communication between mentors and trainees

Platform is open for everyone to use it and to make different projects, seminars, surveys, etc.

eLearning Virtual Mentoring



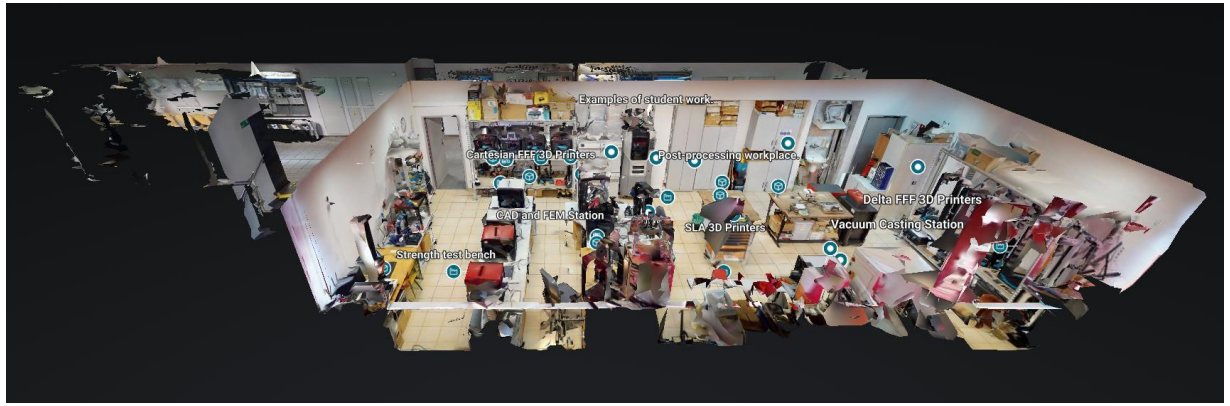
VR AND AR supported learning

Virtual reality (VR) and augmented reality (AR) technology, collectively known as **extended reality (XR),** is becoming increasingly popular in education. According to a recent study by Statista, seven out of 10 teachers desire more VR and AR in education, significantly when it enhances the curriculum and engages students. This technology fosters experiential learning, which:

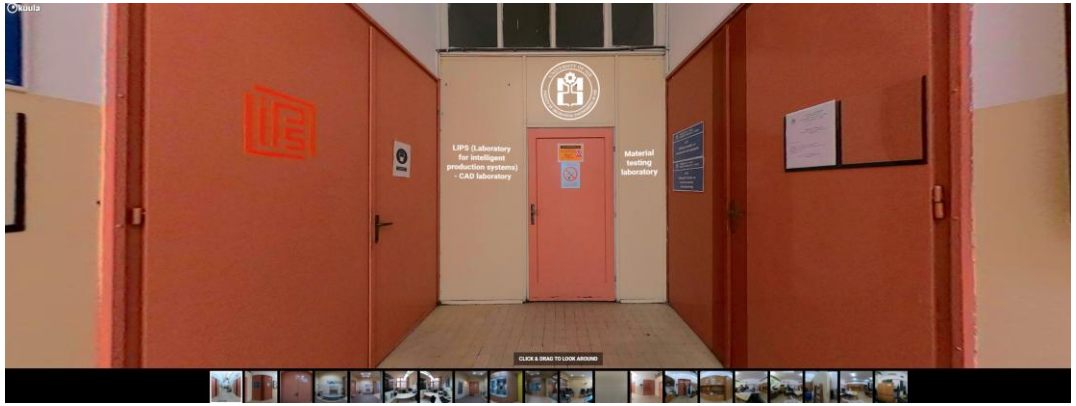
- Helps students make deeper connections with learning.
- Provides hands-on experiences with things they might never otherwise encounter.
- Transcends rote memorization and promotes immersive learning.
- Tailors experiences to students' interests, abilities, and learning styles.

Virtual Tours - 360 software

http://3dspot.pl/120BM - Poznan University of Technology



https://nessy2022.viewin360.co/share/collection/7vT3c - University of Nis, Faculty of Mechanical Engineering



VR AND AR supported learning

Some standard VR and AR interactive experiences include:

- Immersive learning for skill building;
- Creating to-scale 3-D models for architects and engineers;
- Accessibility for differently-abled students;
- High-risk training scenarios for health care professionals;
- Laboratory research methods training for science students;
- Field training for construction and advanced manufacturing specialists.

VR AND AR supported learning

Have you ever seen the Volcanos, beautiful mountains? Perhaps you want to **experience the real world**.https://www.youtube.com/watch?v=Hbg9evpdZYk

VR and AR technology in education can transport you into environments beyond your borders. Experiences that are impractical in a traditional classroom can become everyday activities.

AR and VR have the power to democratize education, allowing individuals without access to specific resources to develop practical skills **through experimental learning.** These experiences not only enhance intellectual intelligence but also boost emotional intelligence, fostering deeper levels of critical and abstract thinking.

VR AND AR supported learning

Augmented and virtual reality in education offers a powerful unifying benefit—inclusivity. Thanks to the growth of VR and AR, students of all abilities can have immersive learning experiences. https://youtu.be/S3YoVLBK_Vc

Activities that were once limited to a single learning style are now accessible to all types of learners, with technological advancements continually enhancing accessibility.

VR and AR are particularly empowering for students with learning disabilities. This technology breaks down learning barriers by enabling differently-abled students to learn through experience.

VR AND AR supported learning

Creating VR content with Unity

Practical demonstration

"*When we are young, things look big. When we are older, things look small, and we always want more.*"

Unity – Tool for the Job

Everybody heard about Unity

Create Games, Simulation software, and **Educational Software**

Develop imagination and skills

Real Time Development Platform

https://unity.com/

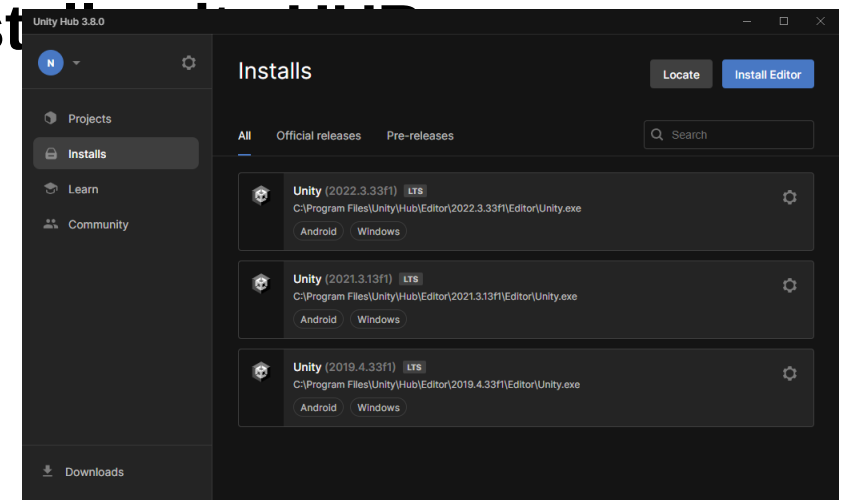
Unity – Basics

Install Unity 2022.3 LTS

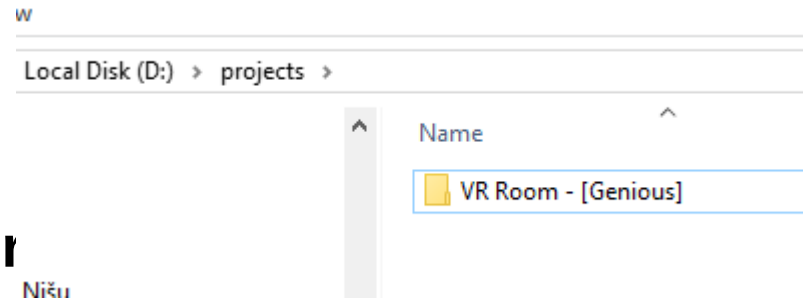
Before you can follow this course, you must install a particular version of Unity

To install Unity Editor (2022.3 LTS) first inst

https://unity.com/download



Unity – Basics



Download and extract the Create with VR starter pr

Create with VR Starter Project

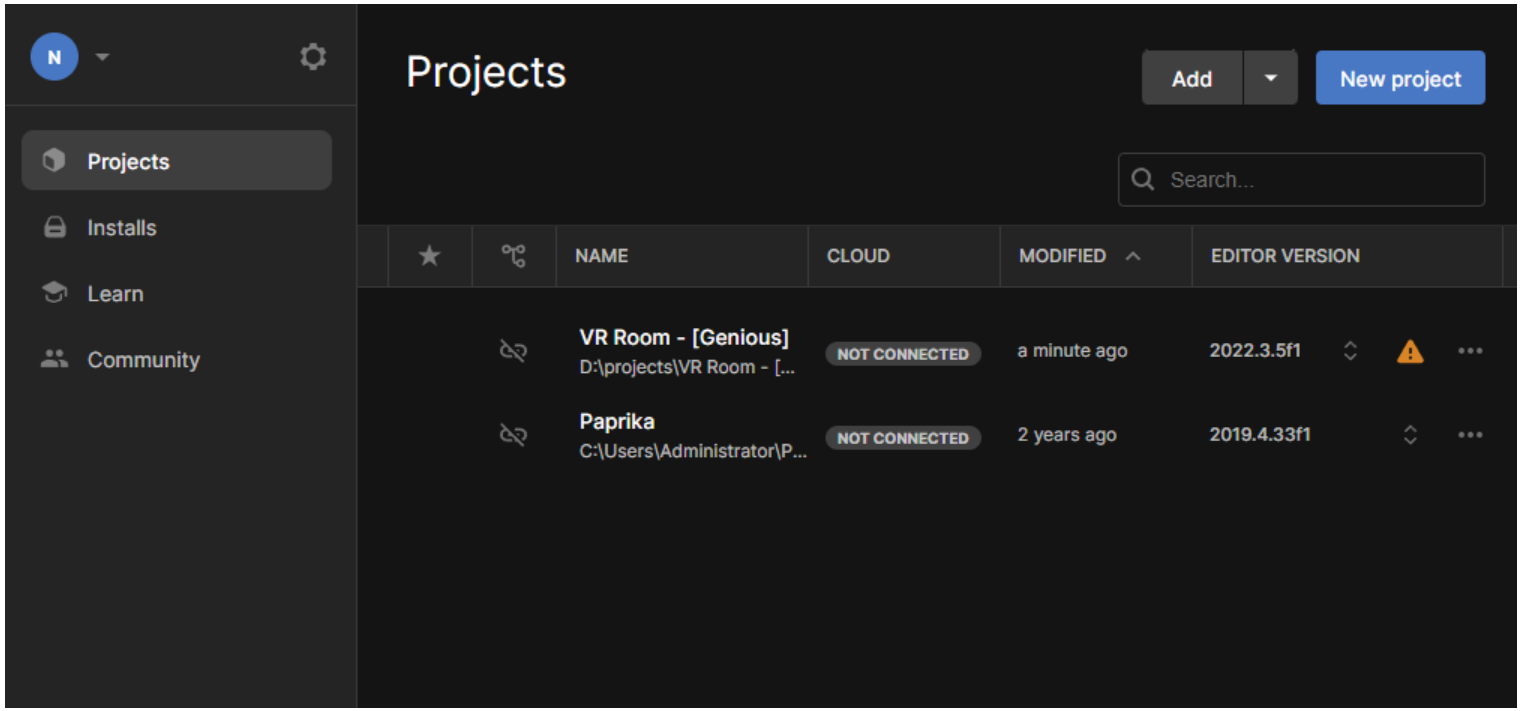
Locate the folder called “VR Room” inside the extracted folder.

If you want, rename the project folder to “VR Room - [Genious]”

Move the project folder to a logical directory on your computer (e.g. a folder called “Create with VR” on your Data disk or project disk).

Unity - Basics

Add Project to Unity HUB…It can take some time…



Unity – Basics

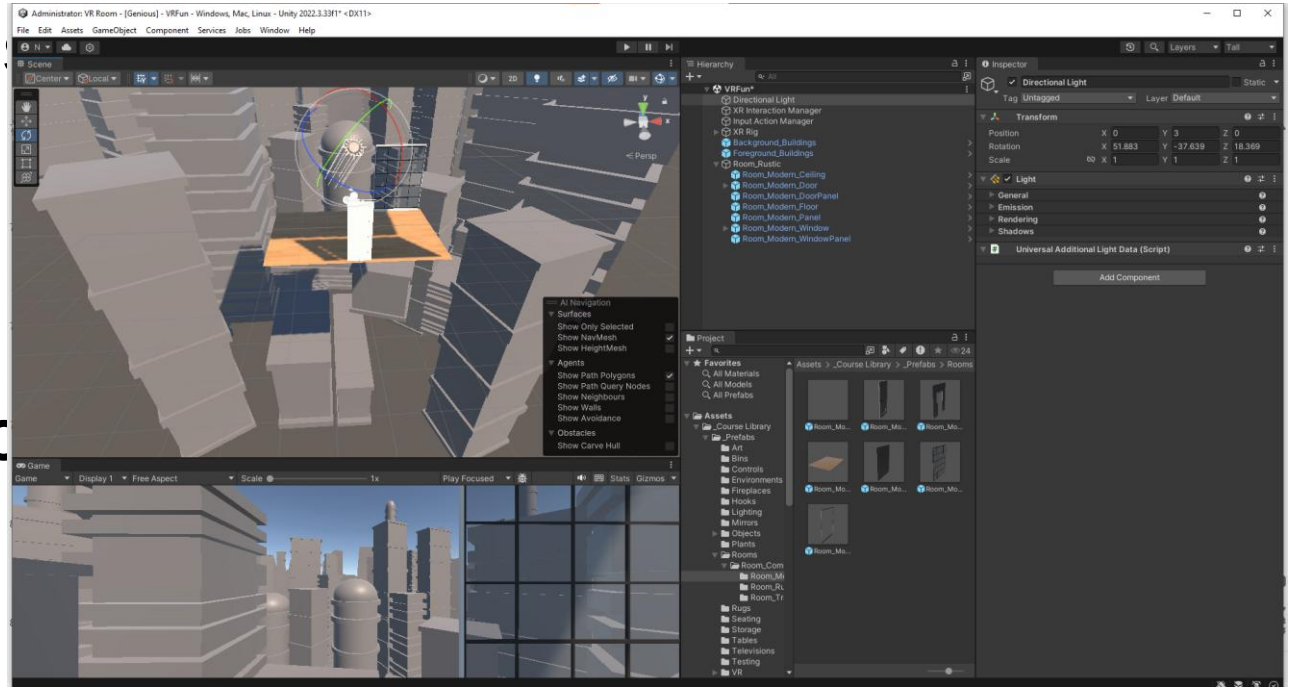
Project packages

- **OpenXR Plugin** - OpenXR is an open, royalty-free standard developed by Khronos that aims to simplify AR/VR development by allowing developers to seamlessly target a wide range of AR/VR devices.
- **Universal RP (Render Pipeline)** - The Universal Render Pipeline (URP) is a prebuilt Scriptable Render Pipeline, made by Unity. URP provides artist-friendly workflows that let you quickly and easily create optimized graphics across a range of platforms, from mobile to high-end consoles and PCs.
- **XR Plugin Management —**This package provides simple management of XR plug-ins. It manages and offers help with loading, initialization, settings, and build support for XR plug-ins.
- **XR Interaction Toolkit -** The XR Interaction Toolkit package is a high-level, component-based, interaction system for creating VR and AR experiences. It provides a framework that makes 3D and UI interactions available from Unity input events.

Unity – Basics

Prefabs are a special type of component that allows fully configured GameObjects to be saved in the Project for reuse.

- **Insert Room from prefab**
- **Insert Foreground and Background**
- **Run device with simulato**
- **Have fun with light**



Future Webinars

- Specific learning methodology (NEM, Adaptive Learning, Tutoring)
- AI in Teaching
- Applications for eLearning (Design in Moodle)
- Specific VR and AR tutorials (3D Modelling, Scenes, Camera,…)
- Specific AR and VR equipment (Oculus, Meta Quest, PlayStation VR)

…

Discussion time…

Questions?

University of Niš
Faculty of Mechanical Engineering

Thank You For Your Attention!

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Linkedin