Navigation the digital shift: universities contributing to sustainable education and workforce preparedness

HORIZON-WIDERA programme project «Twinning in Environmental Data and Dynamical Systems Modelling for Latvia»

Ted4Lat Doctoral Schoola and Workshop
«Open Data to Tackle Intertwined Environmental and Social Challenges»
Vidzeme University of Applied Sciences (ViA), Latvia
July 14-18, 2025.
Researcher, Guna Jakobsone-Snepste

TED4LAT, No. 101079206

Funded by the European Union

Faculty of Computer Science, Information Technology and Energy
Institute of Digital Humanities

Study programm: **E-learning Technologies and Management**

Thesis Topic:

«Business and Learning Models of the Digital Age – Entrepreneurship Transformation»

TED4LAT, No. 101079206

Funded by the European Union

Navigating the Digital Shift

Symbolizes the ability to successfully overcome and adapt to digital changes.

Includes learning new technologies or transforming practices in education or other areas of life where digital innovations influence everyday processes.

Skillfulness adapting to the New challenges that arise as transition to digital technologies

Source: https://www.istockphoto.com/

TED4LAT, No. 101079206

Funded by the European Union

Sustainable learning

SUSTAINABLE LEARNING IS **LEARNING FOR ALL**, **TEACHING THAT MATTERS** AND **LEARNING THAT LASTS**.

PRESS *HTTPS://ASSETS.CAMBRIDGE.ORG/97811076/95955/EXCERPT/9781107695955_EXCERPT.PDF*)

TED4LAT, No. 101079206

Funded by the European Union

Universities Contributions to Sustainable Education and Workforce Preparedness

LIEPĀJAS UNIVERSITĀTE

DAUGAVPILS UNIVERSITĀTE

VIDZEMES AUGSTSKOLA

RTA REZEKNES TEHNOLOGIJU AKADĒMIJA

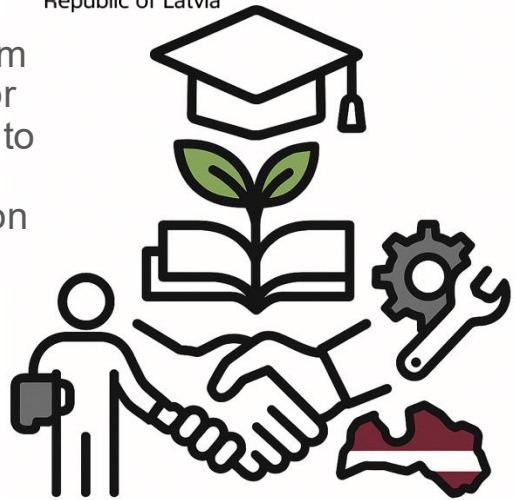
LJA

1862

RĪGAS TEHNISKĀ UNIVERSITĀTE

Central Finance and Contracting Agency Republic of Latvia

Five higher education institutions in Latvia received support from the CFCA (CFLA) for the ***EduAim*** project to contribute to sustainable education and workforce readiness.



eduaim

TED4LAT, No. 101079206

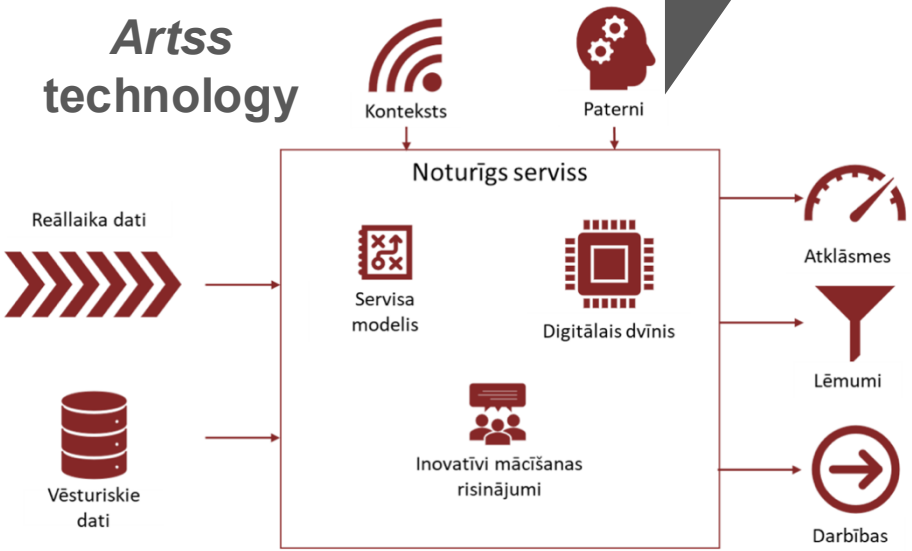
Funded by the European Union

eduaim

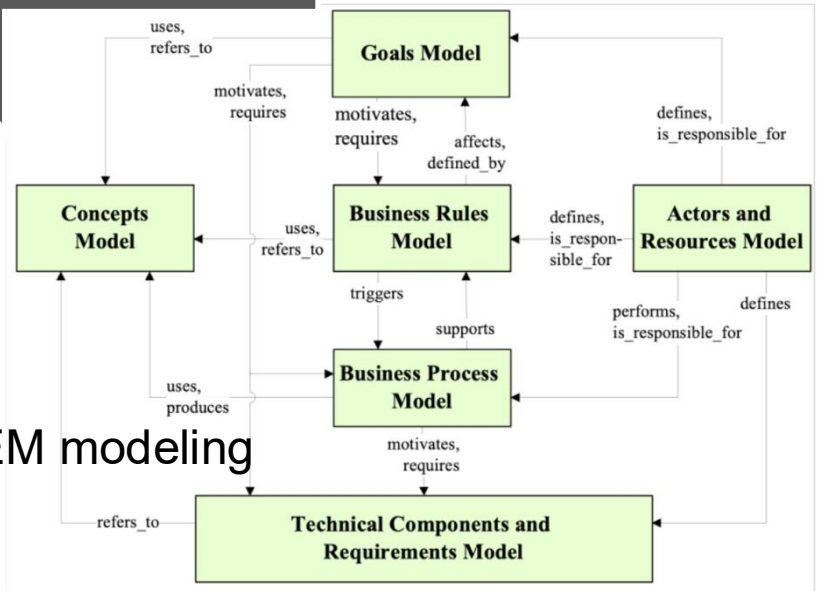
The project successfully achieved its goal of enhancing the digital skills of non-IT students to reach Level 5 of the DigComp 2.2 framework

ARTSS technology and 4EM modelling used to achieve goals

Artss technology

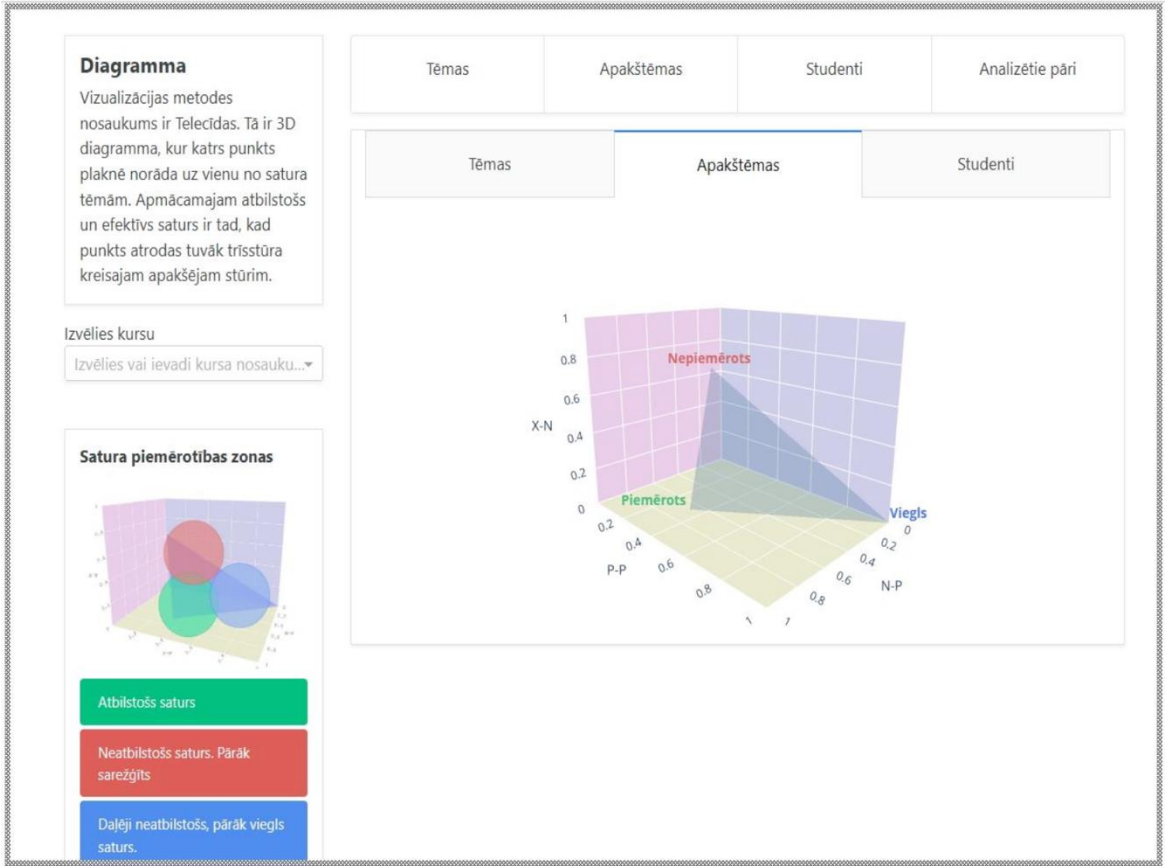


4EM modeling



TED4LAT, No. 101079206

Funded by the European Union



EduAim gives the course content creator access to *ARTSS* learning analytics data both during the learning process and after the course is completed.

eduaim

TED4LAT, No. 101079206

Funded by the European Union

The problem (What you are solving? Why did you choose this topic?)

Teachers spend too much time analyzing and monitoring student knowledge, because there are problems with the automation of knowledge measurement in e-learning systems.

I am researching what works and what doesn't work well in a new e-learning system - *EduAim*, in relation to knowledge analytics, knowledge measurement.

This is important because teachers want to monitoring and analysing students knowledge easily, and companies also want to know the capacity of using knowledges , also know about motivation of their employees.

TED4LAT, No. 101079206

Funded by the European Union

Scientific novelty/innovation (what new you will bring for your science sub-field?)

A **new knowledge measurement model for integration into an e-learning platform** to use a new method of measuring the knowledge of students and company employees, and use this model as a new service - a new business model.

Funded by the European Union

Practical significance (what exactly your solution will improve from a society's point of view?)

Society and business representatives - teachers and entrepreneurs - will gain a method that will be able to objectively reflect knowledge in a form that will be classified into knowledge quanta.

Funded by the European Union

Object of the study (the broader area or field within which the subject of the study exists)

Object: objective knowledge assessment, in the e-study platform, using an innovative method - the knowledge quantum system, with the aim of improving the efficiency of students and employees and creating a new knowledge assessment model and service - business model, offering the new tool.

Funded by the European Union

Subject of the study (the primary focus or phenomenon under investigation, it usually answers the question “About what is the study?”)

A new analytical method for learning - knowledge assessment using a quantum knowledge system.

TED4LAT, No. 101079206

Funded by the European Union

Materials and methods (how you conducted the study so that others could replicate it)

The research is still in its early stages, reviewing theoretical materials, scientific articles and theories, as well as testing and studying the e-learning platform EduAim, its functionality, with a special emphasis on learning analytics. A way is being sought to apply the knowledge quantum system to an existing e-learning platform. When the new system is established, it can be adapted to other systems and the research can be replicated, taking into account the specific knowledge topic at a narrow level. Once the new system is created, it can be adapted to other systems and the research can be replicated, taking into account the specific knowledge topic at a narrow level.

TED4LAT, No. 101079206

Funded by the European Union

Discussion (interpretation of the results to put them in broader context) and Conclusions (what you have concluded so far?)

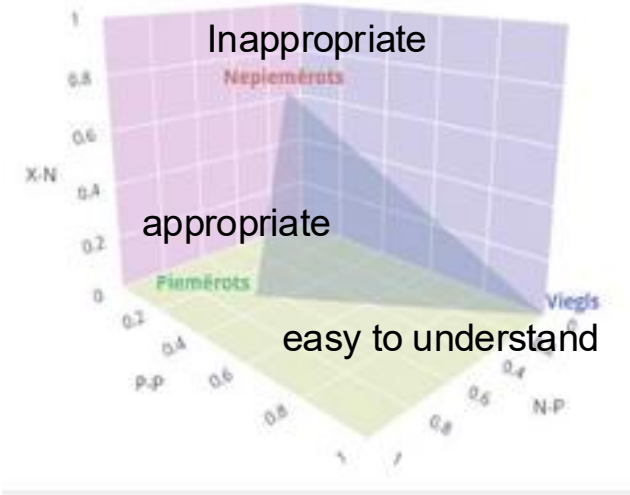
The existing results show that the e-study platform is a good tool for promoting knowledge growth. My study confirms a 21% increase in knowledge in the e-study platform EduAim courses, in which the conditions for self-assessment were met before and after the course. Learning analytics is working, but there is a place for improvements.

In courses where self-assessment was not met, it was impossible to assess what knowledge was before the course started. And the self-assessment technical solution also needs to be supplemented. Therefore, I see a solution in the implementation of a quantum system of knowledge.

TED4LAT, No. 101079206

Funded by the European Union

The graphical interpretation of the data shows the relevance of the course, course topic or subtopic to the needs of the students.

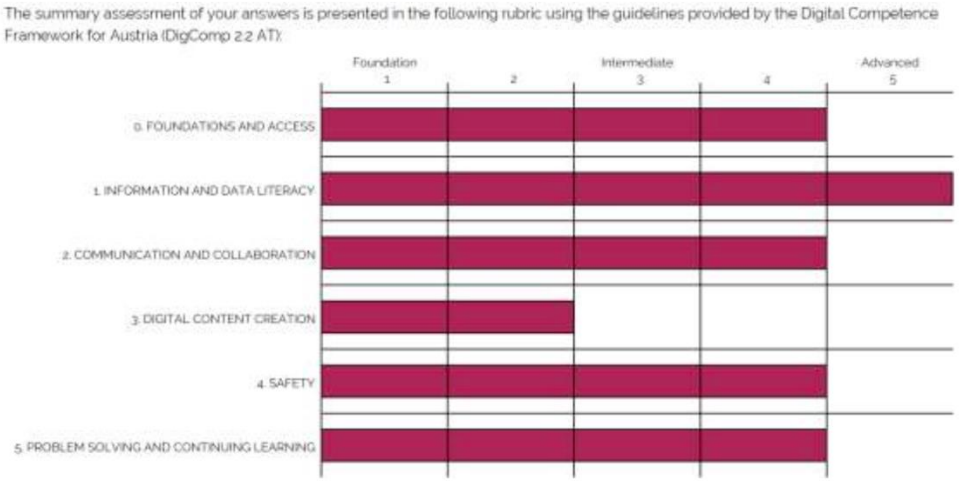


It also shows the relevance of group and individual student needs to the content and teaching methodology of the course or course topic or subtopic

TED4LAT, No. 101079206

Funded by the European Union

To achieve the goal of enhancing the digital skills of non-IT students to Level 5 of the *DigComp 2.2* framework, specialized courses were developed, and existing courses from *Coursera* and *EdX* were adapted.



Additionally, the ***Fit4Internet*** tool was used to provide automated collection of digital skills self-assessment results, content analysis, and feedback to enhance the user experience.

TED4LAT, No. 101079206

Funded by the European Union

EduAim digital skills assessment approach - the concept of self-assessment.

If the skills need to be improved, then an appropriate course is offered.

TED4LAT, No. 101079206

Funded by the European Union

DigComp 2.2 framework

https://joint-research-centre.ec.europa.eu

Information and data literacy	1.1. Browsing, searching and filtering data, information and digital content 1.2. Evaluating data, information and digital content 1.3. Managing data, information and digital content
Communication and collaboration	2.1. Interacting through digital technologies 2.2. Sharing information and content through digital technologies 2.3. Engaging in citizenship through digital technologies 2.4. Collaborating through digital technologies 2.5. Netiquette 2.6. Managing digital identity
Digital content creation	3.1. Developing digital content 3.2. Integrating and re-elaborating digital content 3.3. Copyright and licences 3.4. Programming
Safety	4.1. Protecting devices 4.2. Protecting personal data and privacy 4.3. Protecting health and well-being 4.4. Protecting the environment
Problem solving	5.1. Solving technical problems 5.2. Identifying needs and technological responses 5.3. Creatively using digital technologies 5.4. Identifying digital competence gaps

TED4LAT, No. 101079206

Funded by the European Union

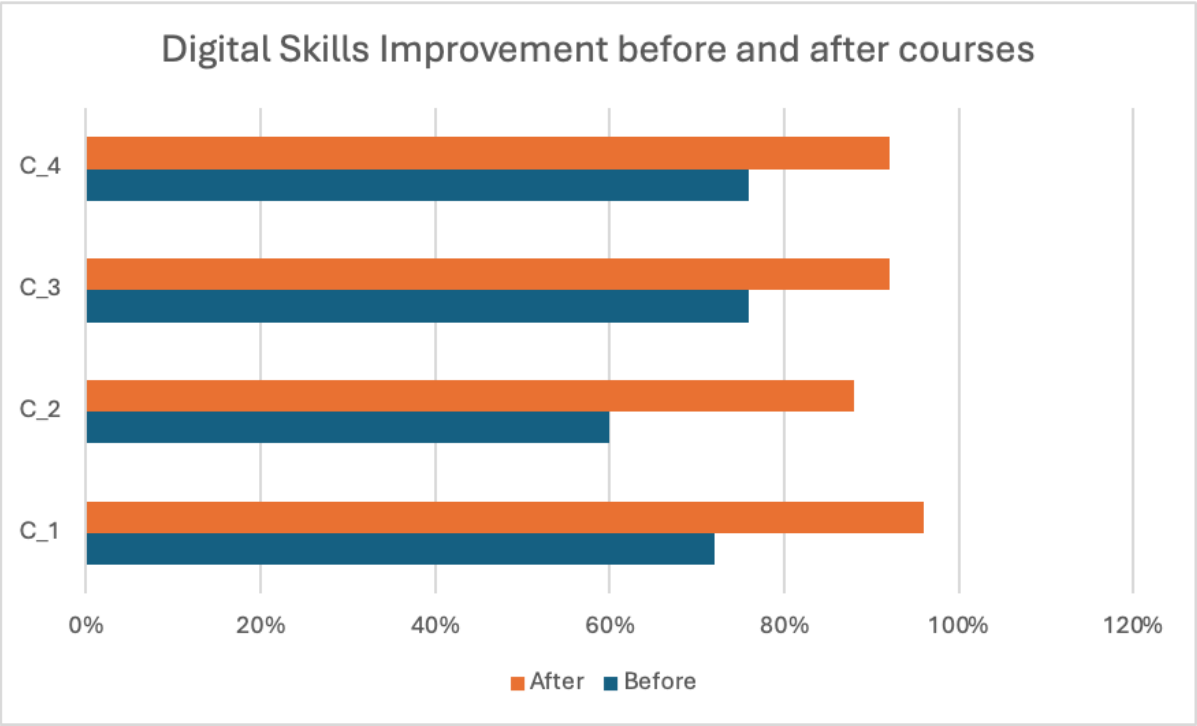


Fig. 1. Latvia Maritime Acadamy (LMA) Students Digital Skills Improvement before and after 4 different DigComp 2.2 courses

HORIZON-WIDERA programme project «Twinning in Environmental Data and Dynamical Systems Modelling for Latvia»

TED4LAT, No. 101079206

Funded by the European Union

Course	Registered	Self-Assessments	Certificates	Improvement
C_1	71	12	0	24%
C_2	39	31	29	28%
C_3	11	8	6	16%
C_4	55	11	8	16%
Course	Registered	Self-Assessments	Certificates	Improvement
Total	176	**62**	43	**21%**

Table 1. LMA Students Digital Skills Improvement after four DigComp 2.2 courses

HORIZON-WIDERA programme project «Twinning in Environmental Data and Dynamical Systems Modelling for Latvia»

TED4LAT, No. 101079206

Funded by the European Union

Activity on *EduAim* Portal

We engaged students, but because the site is still available, they can continue to study independently if there are students.

Members are registered on the site

After the end of project, the active users was about

31.12.2023

October active users by 10.10.2024

Maintaining the platform requires significant time and financial resources.

We are actively exploring options to ensure the platform's sustainable continuation.

However, due to security concerns and the need to protect existing user data, we are currently considering shutting down the platform to prevent potential exposure to uncontrolled social cyber threats.

TED4LAT, No. 101079206

Funded by the European Union

Conclusion

EduAim includes Learning Analytics, Knowledge Perception Monitoring, a Digital Skills Assessment Tool, Facial Expression Recognition, a Reading Assistance Tool, and Virtual Reality solutions.

The EduAim courses were piloted by five Latvian partners, with over 250 learners participating in the trial sessions. In total, over 40 courses were piloted.

To evaluate how the implementation of digitalization initiatives in universities has contributed to performance (knowledge and skills) and capacity building, there were surveys, expert interviews, and involvement of international experts.

TED4LAT, No. 101079206

Funded by the European Union

Conclusion

In all partner institutions, based on the analysis of baseline measurement results, the universities' development strategies (in the strategy appendix “Digital Transformation Plan”) included a description of the institution's digital transformation monitoring system, including a digitalization level measurement plan.

Within the framework of the EduAim project, the institutional self-assessment of digitalisation of Latvian Higher Education Institutions (HEI) is carried out twice. The first self-assessment conducted in January 2023, and the second - in December 2023. For this purpose, the “HEInnovate self-assessment (self-reflection) tool is used, adapting the framework proposed by the European University Association (EUA).

Category	LiepU	DU	RTA	ViA	LJA	Average
1st assessment -Digital Transformation and Capability	2	3,6	4,4	2,9	2	2,98
2nd assessment -Digital Transformation and Capability	4,2	4,1	4,6	3,6	4,4	4,18

TED4LAT, No. 101079206

Funded by the European Union

The main Conclusion

A timely response to the growing need for advanced digital skills is a critical task for modern universities.

In all partner institutions, based on the analysis of baseline measurement results, the universities' development strategies (in the strategy appendix “Digital Transformation Plan”) included a description of the institution's digital transformation monitoring system, including a digitalization level measurement plan.

Recommendations

The permanent availability of advanced learning content, coupled with robust support systems, should be a key component of the social and economic ecosystem and sustainable learning in the digital age.

TED4LAT, No. 101079206

Funded by the European Union

TED4LAT, No. 101079206

Funded by the European Union

Authors and Inspirers:

MBA Guna Jakobsone-Snepste

Riga Technical University
Latvia

Ph.D Guillaume Deffuant

INRAE
France

Ph.D Lasma Ulmane-Ozolina

Riga Technical University
Liepaja Academy, Latvia

Ph.D Janis Kapenieks Sr.

Riga Technical University
Latvia

Ph.D Atis Kapenieks

Riga Technical University
Latvia

TED4LAT, No. 101079206

Funded by the European Union

Thank you for your attention!

H2020 project «Twinning in Environmental Data and Dynamical Systems Modelling for Latvia»

TED4LAT, No. 101079206

Funded by the European Union