ICT-INOV
MODERNIZING ICT EDUCATION FOR HARVESTING INNOVATION

D3.4 Report on instructor training at partner sites

Mid-project progress summary

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Executive summary

ICT-INOV aims to promote innovation skills in Computer Science and Engineering higher education through a gamified design thinking methodology that fosters the capacity of students and to apply turn ideas into action and apply engineering knowledge towards resolving the world's modern, 21st century challenges. Design thinking allows teams to better understand problem parameters through a process of discovery and empathy that helps identify real, as opposed to perceived, user needs. More accurate problem statement definitions enable the design of solutions to difficult challenges, even when none appears to exist at first glance. Ideation practices help introduce a wealth of ideas towards potential solutions, from which a design team selects one for prototyping based on criteria related to feasibility, viability, and maturity of technology. Evaluation of the prototype with users provides feedback for refining solutions. Gamification elements, such as clear and interesting goals, a sense of affiliation, rewards, and recognition promote the long-term engagement of students with the educational process.

ICT-INOV aims to develop innovation competences through a holistic process that addresses all challenges that hinder the wider deployment of emerging learning design. The project develops physical labs and digital learning infrastructures and educational content. It further delivers instructor training and organizes community building events for building the capacity of organizations to deploy the proposed gamified design thinking approach.

The ICT-INOV instructor training strategy includes two main tangents. The first is plenary instructor training of a core team of ICT-INOV educators, who develop theoretical and practical knowledge on deploying gamified design thinking. This is achieved through two weeklong training events that already took place in Porto and Hanoi and constitute deliverables D4.4 and D4.5. The second is instructor training events at partner sites. Each partner will organize 4 – 5 training events throughout the project implementation period, reaching at least 30 educators and staff.

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This on-going instructor training process at partner sites will contribute to the capacity of organizations to deploy the proposed gamified design thinking educational approach for innovation skill development.

This document presents a summary of instructor training events at partner sites from the beginning of the project implementation period until today. The report will be updated at the end of the project implementation period to include all events.

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Instructor training at partner sites

The following sections present instructor training activities at partner sites.

1. University of Thessaly

1.1 Instructor training at the Department of Electrical and Computer Engineering of the University of Thessaly, May 27, 2022

1.1.1 Location, context, time, and duration

A 1st instructor training event took place at the Department of Electrical and Computer Engineering of the University of Thessaly on May 27, 2022. The event took place in one of the two computer labs of the Department of Electrical and Computer Engineering. It was promoted via email to the faculty department.

1.1.2 Participants

The event was attended by 10 higher education instructors from the Department of Electrical and Computer Engineering of the University of Thessaly.

1.1.3 Description of activities

The audience had the opportunity to be exposed to design thinking and gamification principles, which are the backbone of the proposed ICT-INOV methodological learning approach for developing innovation skills in higher education.

In addition, the audience was exposed to examples of exercises that can be deployed in the design thinking process steps of team building, fostering creativity, problem discovery, empathy, problem redefinition, ideation, idea selection, prototyping, and evaluation.

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Finally, the audience experienced a demo of the ICT-INOV learning platform. More specifically, the audience was exposed to both the educator and student interfaces. On the educator side, the audience saw how to create an activity, how to post instructions for students for each design thinking steps, the platform analytics, the gamification elements that promote engagement through rewards, the access to the reference manual, the calendar of activities, and more. Furthermore, the audience saw the resource library available in the platform, which includes suggested exercises for each design thinking step from which educators can select ideas for integrating into the activities they design for their students. On the student side, the audience saw how students register to a class, join a team, and participate in design thinking by sharing ideas on a common team working space. In addition, how to ask for help by the instructor and to open the team canvas to the entire class for additional feedback, if so desired.

The audience was exposed to actual ICT-INOV activities developed for the Software Engineering and Technologies in Education courses. These activities have already been used in courses, and the audience had the opportunity to see student canvas as examples of good practice. In addition, the audience discussed activities of interest to students, such as reducing CO2 emissions in data centers.

In all, it was a very productive activity that achieved its goal of promoting the update of project outcomes.

1.1.4 Feedback and dissemination

The event was very well received. Participants made suggestions on the enrichment of the platform by considering agile design approaches. They expressed interest in integrating the platform in their courses and recommended deploying the platform beyond the University of Thessaly. More information on the event is available at [1st instructor training event, UTH 27/5/2022 (ictinov-project.eu)](), which also includes the presentation delivered.

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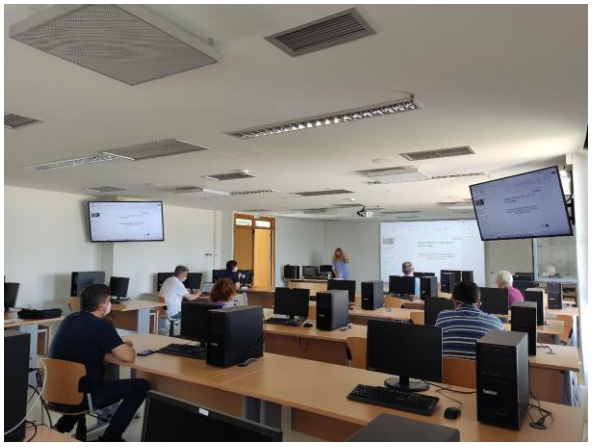
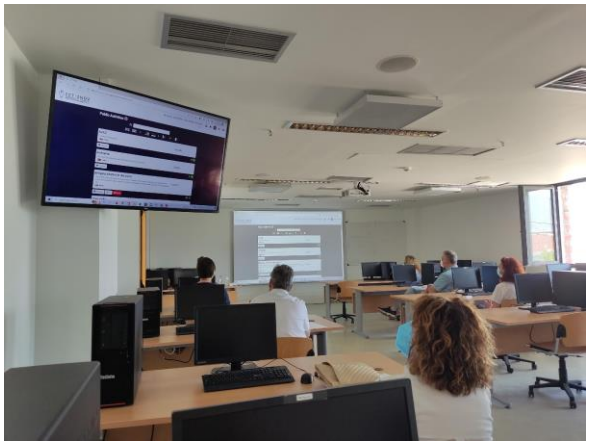
The event was promoted via email to all faculty members, both permanent and recurring, of the Department of Electrical and Computer Engineering of the University of Thessaly. The event is disseminated on the portal of the Department of Electrical and Computer Engineering Creative Technologies Learning Lab portal at ICT-INOV 1st instructor training at UTH, 27/5/2022 and the Creative Technologies Learning Lab social media page at https://www.facebook.com/plugins/post.php?href=https%3A%2F%2Fwww.facebook.com%2Fpermalink.php%3Fstory_fbid%3D767940484582307%26id%3D100628114646884&show_text=true&width=500.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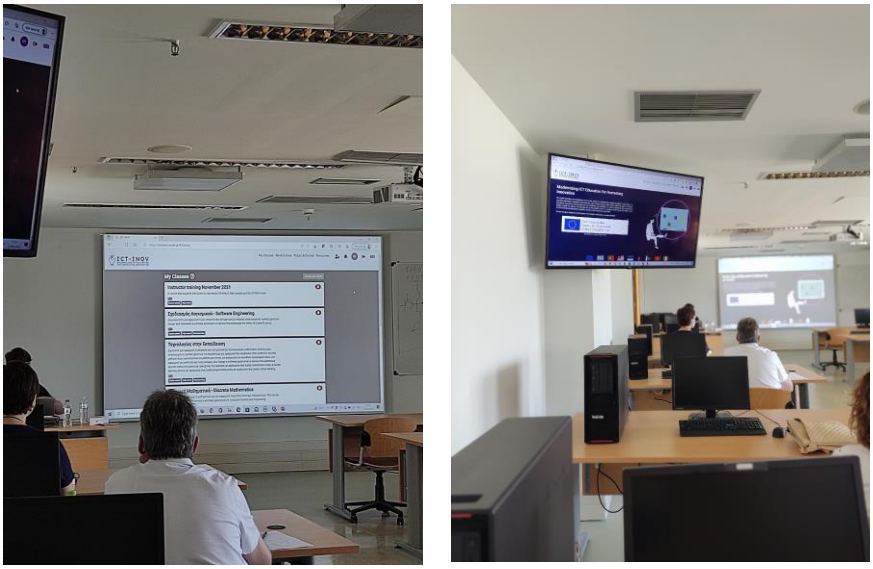

Figure 1. 1st instructor training event at the Department of Electrical and Computer Engineering, University of Thessaly, May 27, 2022.

1.2 Instructor training at the Department of Civil Engineering of the University of Thessaly, October 11, 2022

1.2.1 Location, context, time, and duration

The 2nd instructor training event took place at the Department of Civil Engineering of the University of Thessaly on October 11, 2022. The event took place virtually and had a duration of 2 hours.

B1.1.2 Participants

The event was attended by 10 individuals, 2 of whom are educators at the Department of Civil Engineering of the University of Thessaly, while the rest are educators and researchers in academic organizations in the Netherlands, Germany, and Ireland.

1.2.3 Description of activities

The audience had the opportunity to be exposed to design thinking and gamification principles, which are the backbone of the proposed ICT-INOV methodological learning approach for developing innovation skills in higher education. They became familiar with design thinking steps of problem discovery, empathy and user needs analysis, problem re-definition, ideation, prototyping, and evaluation. In addition, the audience was familiarized with specific exercises that can be integrated into design thinking steps. The exercises are available through the resources area of the ICT-INOV digital learning platform. Finally, the audience was exposed to the platform itself through a demo. The platform has been made available for them for use, promoting the uptake of project outcomes beyond the consortium.

1.2.4 Feedback and dissemination

The feedback of the audience was overwhelmingly positive. Participants commented that the proposed learning intervention can be integrated with serious games for building skills in diverse sectors, such as water management and democracy education.

The event was promoted to the audience via email. It was further disseminated through the internet and social media. The event was disseminated on the portal of the Creative Technologies Learning Lab at Instructor training for project ICT-INOV 11/10/2022 (uth.gr) and on the group's social media pages at the address https://www.facebook.com/permalink.php?story_fbid=pfbid0fy8gHPkVi4XoAgsrjZ4HuPrChSoAgGGQGUX5zj28CPFFhqDPxH1DyoCPcCM1dkGBl&id=100057213949197 .

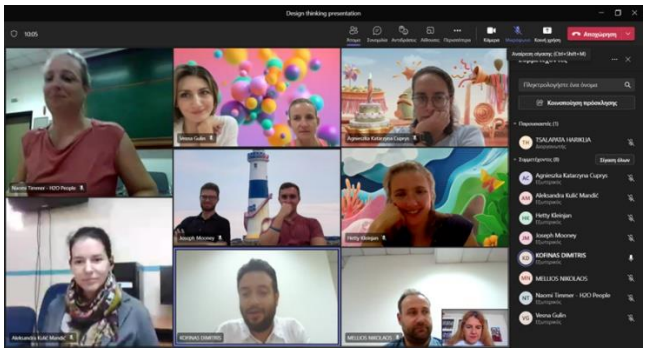

Figure 2. 2nd instructor training event at the University of Thessaly Department of Civil Engineering, October 11, 2022.

1.3 Instructor training targeting the Hellenic Open University, December 9, 2022

1.2.1 Location, context, time, and duration

The 3rd instructor training event took place virtually and targeted educators at the Hellenic Open University. The event took place on December 9, 2022. It had a duration of 1 hour and 30 minutes.

B1.1.2 Participants

The event was attended by 18 educators of the Hellenic Open University.

1.2.3 Description of activities

The event started with a presentation of design thinking and its steps, including problem discovery, empathy, problem re-definition, ideation, evaluation of ideas, prototyping, and testing with users. In addition, the audience was exposed to design thinking cases in entrepreneurship and social entrepreneurship as well as had the opportunity to contemplate the deployment of design thinking in order to maximize the benefit of ICT as a tool for addressing business and social issues in the 21st century.

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The audience became familiar with the ICT-INOV project objectives, activities, partners, and outcomes, including the development of physical infrastructures, digital services such as the ICT-INOV gamified digital learning platform, learning activities, and community building for promoting the uptake of the proposed learning intervention for promoting innovation skills in ICT. The audience was also familiarized with the Capacity Building in Higher Education Erasmus+ program.

Subsequently, the audience engaged in a demonstration of the ICT-INOV gamified design thinking platform and its functionality, including the structuring of educational activities, the creation of courses and their association with educational content, the shared workspaces that promote collaboration, the instructor resources, and more. The audience had the opportunity to review course work implemented through the ICT-INOV digital learning platform as examples of the platforms offered capabilities and as good practices.

1.2.4 Feedback and dissemination

The feedback of the audience was overwhelmingly positive. The audience, being members of the Hellenic Open University where classes take place virtually, related immediately to the added value of the proposed ICT-INOV gamified digital learning platform which supports group collaboration in the context of project work, a functionality that is missing from learning management systems that typically only support the sharing of educational content. Educators asked for more resources and reference material, which was provided. The event was disseminated through social media and the internet. Information on the event is available on-line at the address, including the presentation delivered and dissemination links. An attendance list is also available, having been automatically generated by the on-line meeting system.

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Figure 3. 3rd instructor training event targeting educators at the Hellenic Open University, December 9, 2022.

2. Porto Polytechnic

2.1 1st instructor training event at Porto Polytechnic, November 16, 2022

B2.1.1 Location, context, time, and duration

A first instructor training event will take place at the Engineering School of the Porto Polytechnic on the 16th of November of 2022. The event is scheduled to take place in a mix of theoretical and practical application.

B2.1.2 Participants

Educators and researchers of the School of Engineering of Porto Polytechnic.

2.1.3 Description of activities

The event will be divided in 2 sessions. The first session will involve a presentation of theoretical concepts about active learning, design thinking, and gamification. Presentation of related projects. The 2nd session will focus on practicing the use of the ICT-INOV gamified digital learning platform. On the educator side, the audience will have the opportunity to create an activity, post instructions for students for each design thinking step, review the platform analytics, review the

gamification elements that promote engagement through rewards, access the reference manual, use the calendar of activities, and more. Furthermore, the audience will see the resource library available in the platform, which includes suggested exercises for each design thinking step from which educators can select ideas for integrating into the activities they design for their students. On the student side, the audience will experience how students register to a class, join a team, and participate in design thinking by sharing ideas on a common team working space. In addition, how to ask for help by the instructor and to open the team canvas to the entire class for additional feedback, if so desired.

The audience will also become familiar with the current ICT-INOV activities developed in Portugal and in the other countries

Documents and content used

A presentation will be prepared describing design thinking and gamification in general and the ICT-INOV project objectives.

The ICT-INOV platform will be used by the participants

2.1.4 Feedback and dissemination

The event is promoted through a presentation on the Porto Polytechnic School of Engineering portal and through the mailing list to all the professors and researchers of the school.

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3. Tallinn University

3.1 1st instructor training at the School of Digital Technologies of the Tallinn University, April 18th, 2022

3.1.1 Location, context, time, and duration

The 1st event at Tallinn University took place in the Center for Educational Technology in the School of Digital Technologies. The event was planned at the same time as the weekly seminar of the organization, in which innovative ideas are presented. It had a duration of 2 hours.

3.1.2 Participants

The event was attended by 10 participants, all of whom are educators at the Center of Educational Technology and the School of Digital Technologies. The event had a hybrid format, with some people attending in-person at the Center while others on-line via Google® Meet.

3.1.3 Description of activities

The event started with a presentation of the project by Prof. Jaanus Terasmaa and Triinu Jesmin. Subsequently, participants were exposed to the idea of design thinking and the ICT-INOV digital learning platform. The organizers presented showcases and examples of use of the platform in learning contexts.

The second part of the event was hands-on activity. First, participants performed exercises as students, becoming familiar with the student interface of the ICT-INOV digital learning platform. The activities allowed the audience to develop familiarity on how the platform can support the design thinking process steps of team building, fostering creativity, problem discovery, empathy, problem redefinition, ideation, idea selection, prototyping, and evaluation.

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Finally, participants used the platform as teachers, exploring the functionality of the teacher interface. More specifically, the audience developed familiarity with creating a new activity, posting instructions for students for each design thinking step, reviewing the platform analytics, using the gamification elements that promote engagement through rewards, accessing the reference manual, using the calendar of activities, and more. Furthermore, participants were introduced to the resource library available in the platform, which includes suggested exercises for each design thinking step from which educators can select ideas for integrating into the activities they design for their students.

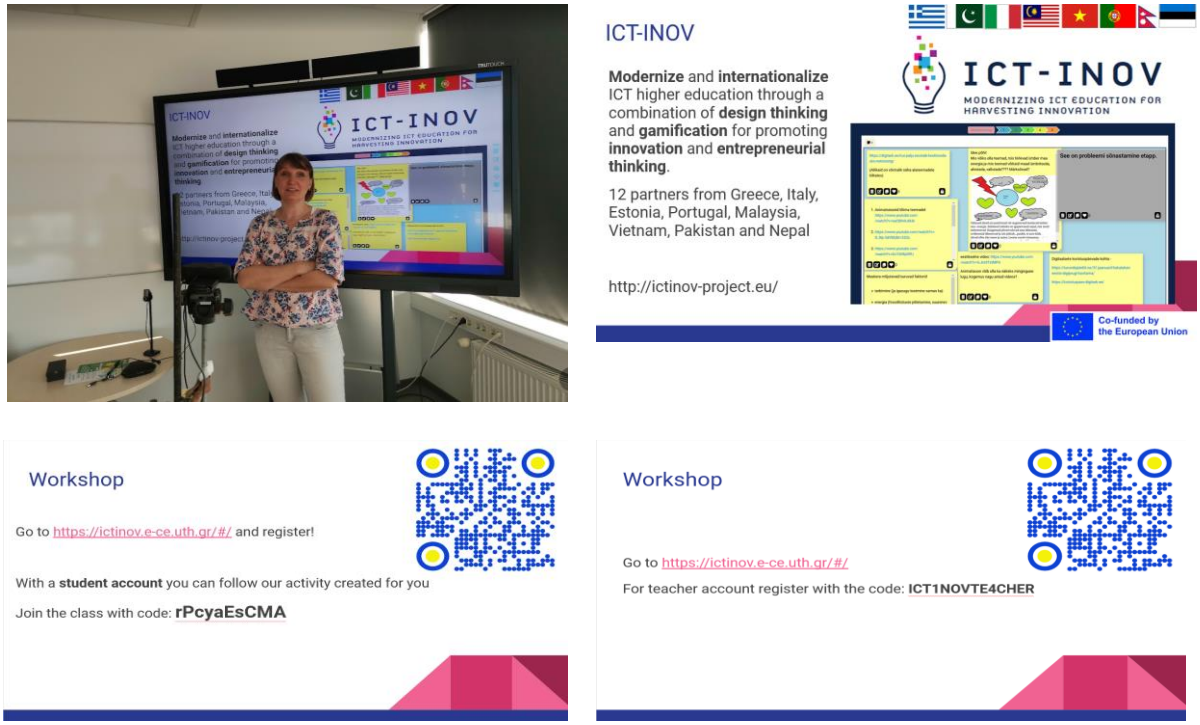

Figure 4. 1st instructor training event at Tallinn University, April 18, 2022.

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3.1.4 Feedback and web presence

The event was a success. Participants were very pleased with the methodology and platform. They showed interest and further collaboration activities were proposed. The event was promoted internally at Tallinn University via email.

3.2 2nd instructor training event at Tallinn University ELU seminar August 24, 2022

3.2.1 Location, context, time, and duration

The 2nd instructor training event of ICT-INOV took place at Tallinn University on August 24, 2022 as part of the Tallinn University ELU seminar. ELU is an interdisciplinary project that all the students, both undergraduate and graduate, are required to enroll in. The project is usually coordinated by university staff. The ELU seminars are organized twice a year. They have the format of a workshop, in which ELU supervisors build new skills and become familiar with new tools. The event took place at the ELU study area, which is an open space designed for collaborative work with no stationary computers. The event had a duration of 3 hours with a half an 1-hour break in the middle.

3.2.2 Participants

The event was attended by Tallinn University staff members who are ELU project supervisors. The event was attended by 25 individuals.

3.2.3 Description of activities

The event started with an introduction of the objectives of the ELU project, materials, and deadlines. Then participants introduced themselves. Prof. Jaanus Terasmaa delivered a presentation why design thinking is useful in ELU projects and Triinu Jesmin continued with the introduction of design thinking methodology.

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After this theoretical session, a practical workshop followed. Participants were introduced to the ICT-INOV portal and digital learning platform, including the functionality from the point of view of student and educator. In addition, participants were exposed to a specific class in the ICT-INOV digital learning platform that has been developed for supporting an ELU project. The audience had the opportunity experience how students in the class used the platform to collaborate in their projects through content and idea sharing. The event closed with an open question and discussion and sharing of informational material.

3.2.4 Feedback and web presence

The feedback on the event was very positive. Some of the instructors opted to use the ICT-INOV platform in their student projects and some asked for additional individual help with he platform functionality. The ELU coordinator requested the organization of an additional similar training event for staff.

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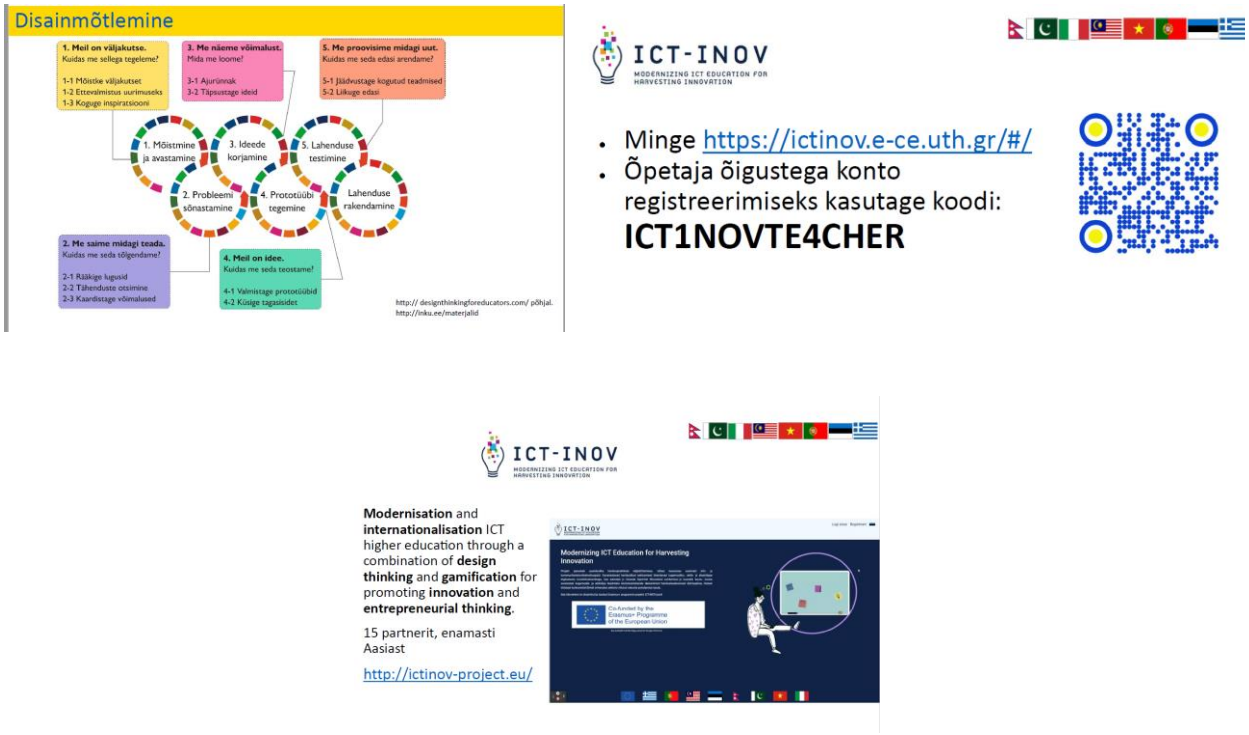

Figure 5. Pictures from the 2nd instructor training event at Tallinn University, August 24, 2022.

3.3 3rd instructor training event at Tallinn University, August 29, 2022.

3.3.1 Location, context, time, and duration

The 3rd instructor training event took place at Tallinn University during the High5 Conference, which aimed at introducing Integrated Design, an approach that combines design thinking with problem-based learning, as an educational method in Estonia. The 1st part of the day consisted of theoretical presentations on Integrated Design. The 2nd half of the day involved hands-on workshops. One of the workshops conducted, named “Digital tools in ID” by Triinu Jesmin, was the workshop in which the ICT-INOV digital learning platform and materials were introduced.

3.3.2 Participants

Participants were Estonian educators. A total of 14 individuals attended the event.

3.3.3 Description of activities

The event started with a short introduction of the design thinking methodology. Subsequently, the ICT-INOV project and portal were presented and the functionality of the ICT-INOV platform from the student point of view was showcased. Finally, the educators in the audience engaged in a hands-on workshop in which they created accounts on the ICT-INOV digital learning platform and experienced the services it offers.

3.3.4 Feedback and web presence

The feedback was very positive. Educators were highly engaged, asked a lot of practical questions, and perceived the tool to be very well suited for their needs.

Figure 6. Pictures from the 3rd instructor training event at Tallinn University, August 29, 2022.

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3.4 4th instructor training event at Tallinn University Euneos teacher training, October 14, 2022

3.4.1 Location, context, time, and duration

The 4th instructor training event took place at Tallinn University October 14, 2022 as part of the Euneos teacher training course, which constitutes in-service training for teachers. The event is being organized on a yearly basis since 2006 and has many partners around Europe. The event took place in a computer lab designed as a collaborative learning space. This room is equipped with computers for every participant and additional screens for presentations. The event had a duration of 3 hours with a 15-minute break in the middle. The course was held in English.

3.4.2 Participants

The course was attended by 10 STEM educators from Finland, Czech Republic, Croatia, Italy and Turkey. Participants were the attendants of the Euneos teacher training course. Participants were cooperative and attentive.

3.4.3 Description of activities

The event started with a presentation on design thinking, a demonstration of the ICT-INOV digital learning platform, and recommendations for the deployment of design thinking and the platform in STEAM education. The presentation included showcases and examples. The audience was asked to share their experiences and discuss the content of the presentations.

The 2nd part of the event was hands-on activity. Participants engaged in exercises as students and had the opportunity to experience how the platform can support design thinking process steps of team building, fostering creativity, problem discovery, empathy, problem redefinition, ideation, idea selection, prototyping, and evaluation. Participants created student accounts to the ICT-

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INOV platform and were divide in teams to simulate the actual use of the platform in learning settings. Participants engaged in activities related to sustainability and electricity.

Finally, the participants logged into the ICT-INOV digital learning platform as educators and experienced how to create learning activities that guide students to collaborate through systematic thinking to address difficult problems. They explored the platform teamwork features and became familiar with the functions of researching and adding notes to the digital workspace in the context of collaboration, further developing an understanding of student and educator experience. Participants were provided with tips and good practice suggestions on how to use the platform for design thinking or broader learning activities. The teachers were also asked to fill an online feedback questionnaire regarding the platform.

3.4.4 Feedback and web presence

The event was a success. The participants were very interested in the proposed ICT-INOV design thinking methodology. They perceived the platform to be interesting and were curious to explore and deploy it. Some teachers stayed after the training to ask additional questions and requested to have the presenters' slides to be sent to them along information on using the platform.

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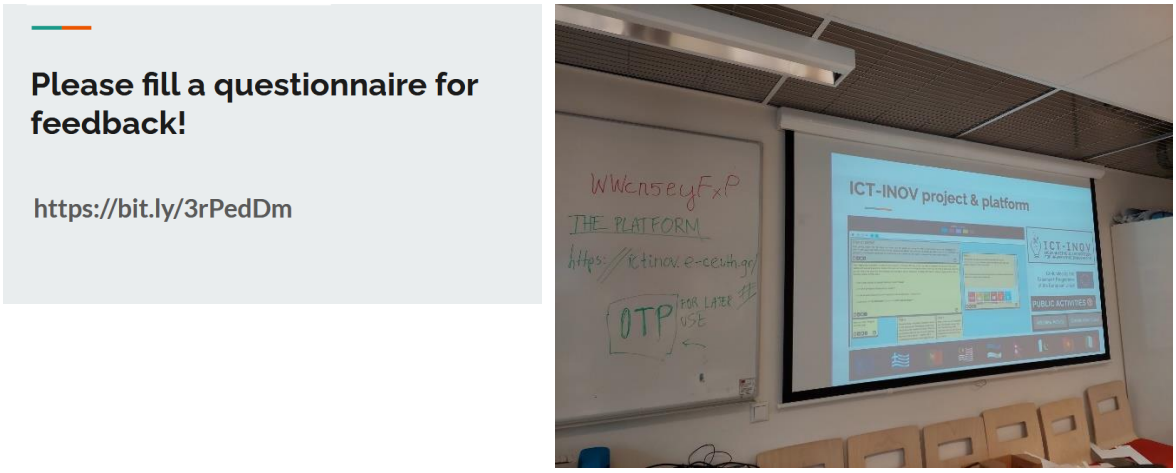

Figure 7. Pictures from the 4th instructor training event at Tallinn University, October 14, 2022.

4. EU-Track

4.1 1st instructor training with GC-FS Alumni of Università Degli Studi "La Sapienza" on March, 4th 2022

4.1.1 Location, context, time, and duration

The 1st instructor-training event organized by EUTrack took place on March 04th 2022. Due to COVID-19 restrictions, the event was organized virtually through the Zoom® platform.

4.1.2 Participants

Eleven higher education instructors attended the event from GC-FS Alumni of Università Degli Studi "La Sapienza", a student association organizing training activities in Lazio and its surroundings on specific topics, such as energy transition, sustainable development, and energy community, all of which focus on critical and practical modern challenges.

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4.1.3 Description of activities

Participants had the opportunity to become familiar with the ICT-INOV project, the project objectives, and the proposed methodological learning approach that aims at developing innovation skills in different sectors with a particular focus in ICT.

In addition, participants participated in engaging activities that demonstrated in depth applications of the design-thinking methodology and process by showcasing the steps of team building, problem discovery, empathy, ideation, prototyping, and testing.

Subsequently, participants were introduced to the ICT-INOV platform, its functionality, and the opportunities it provides in terms of methodological learning design and technical viewpoints. Participants became familiar with both the educator and student interfaces of the platform. In order to demonstrate how the ICT-INOV digital learning platform operates from the instructor's point of view a scenario was created as an example to explain how to manage activities on the platform and how to organize work with the students in small groups. On the other hand, the gamification elements were underlined to promote students' motivation and involvement, for example, by using rewards. In order to demonstrate the platform functionality from the student point of view, participants were encouraged to join a specific class and group, to post ideas in their workspace, and, in general, to navigate through the diverse services. The audience was also exposed to educational activities developed in the platform by ICT-INOV project partners as good examples to follow and emulate.

Finally, participants discussed using the ICT-INOV methodology and tools with their students in Energy Transition classes (Transizione Energetica).

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4.1.4 Feedback and web presence

The participants provided positive feedback on the ICT-INOV gamified design thinking methodology and the digital learning platform. Even for participants that were already familiar with the design thinking approach, the ICT-INOV digital learning platform was a novelty that raised their curiosity. They expressed interest in using the ICT-INOV project approach and tools with their students in their courses throughout the Lazio region.

More information is available at the 1st instructor training event - ICT_INOV project, where the presentation is also available.

The event was promoted via e-mail to the senior instructors of GC-FS Alumni, on the EU-Track web portal, on Facebook®, Instagram®, Twitter®, and LinkedIn®.

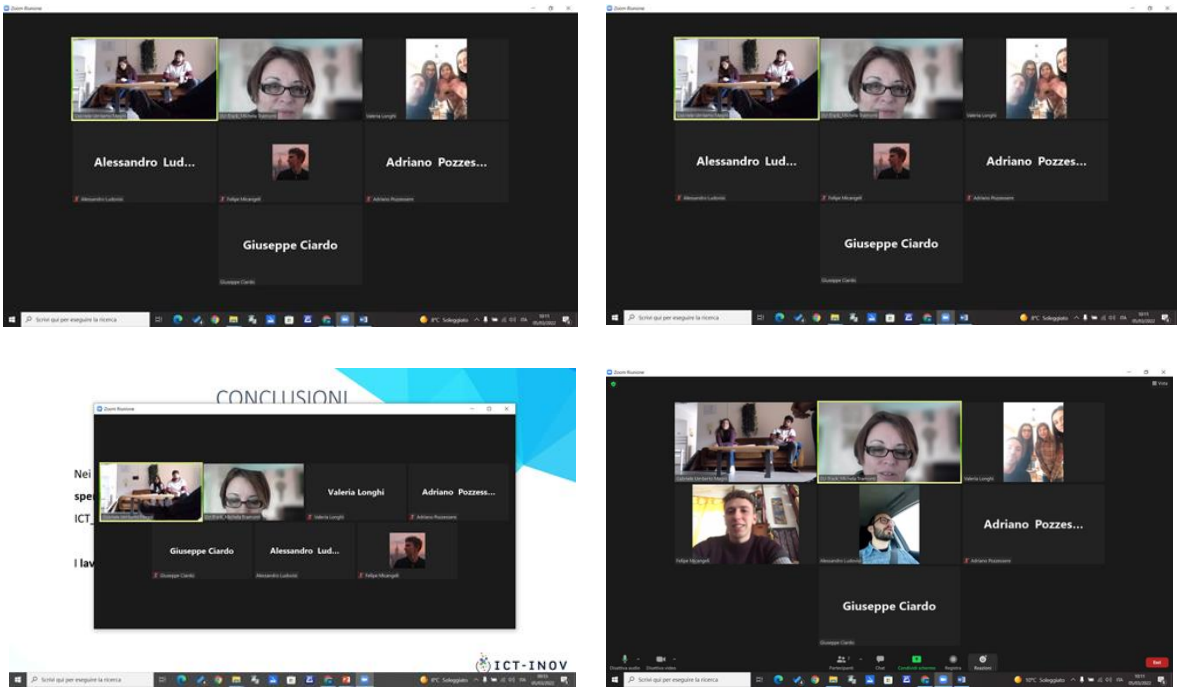

Figure 8. 1st instructor training event with GC-FS Alumni of Università Degli Studi "La Sapienza", March 4th 2022.

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4.2 2nd instructor training with GC-FS Alumni of Università Degli Studi "La Sapienza" on April, 4th 2022

4.2.1 Location, context, time, and duration

The 2nd instructor-training event took place with other senior GC-FS Alumni – Italy senior members on April 4, 2022. Due to COVID 19 restrictions, the event was organized virtually through Google® Meet.

4.2.2 Participants

Five higher education instructors attended the event from GC-FS Alumni of Università Degli Studi "La Sapienza".

4.2.3 Description of activities

Participants had the opportunity to become familiar with the ICT-INOV project objectives, methodologies, and approaches that aim at developing innovation skills through design thinking and gamification techniques in sectors such as ICT, energy, and sustainable development.

Participants were introduced to the design thinking methodology through its key steps of team building, problem discovery, empathy, ideation, prototyping, and testing. Subsequently, the participants engaged with the ICT-INOV digital learning platform and its entire functionality for managing innovation skill building activities. Participants were exposed to the platform services targeting both educators and students through practical exercises.

In relation to the educator interface, a learning scenario implemented in the ICT-INOV digital learning platform was demonstrated to explain how to manage learning activities and how to organize student work in small groups. In relation to the student services, participants became familiar with logging into the platform and joining a course and team. Examples of activities developed by ICT-INOV partners were demonstrated as good practices.

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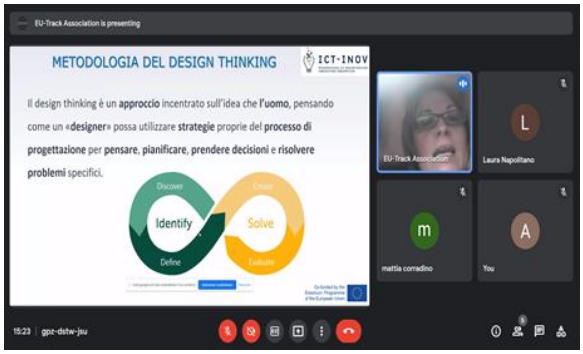
Finally, participants discussed using the ICT-INOV gamified design thinking methodology and tools with their students in their courses.

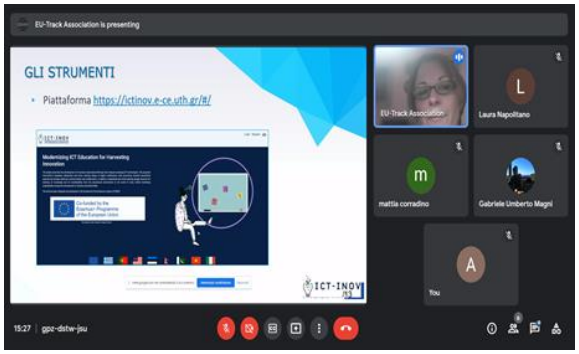
4.2.4 Feedback and web presence

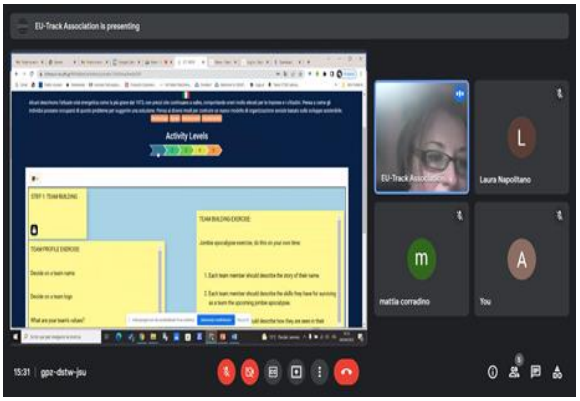
Participants provided positive feedback on the ICT-INOV learning methodology and the platform. In fall 2022, they will deploy the ICT-INOV learning intervention with their students.

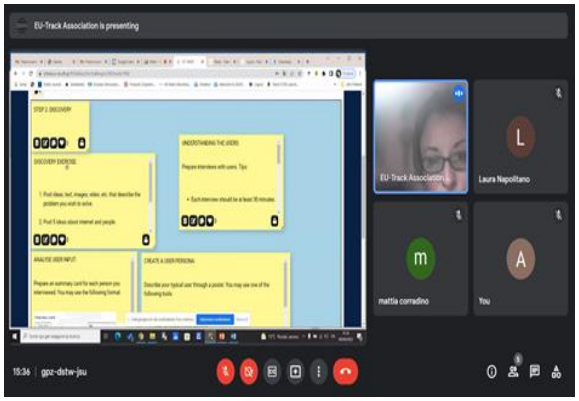
More information is available at the 2nd Instructor Training Event - ICT_INOV Project, where the presentation is also available.

The event was promoted via e-mail to the senior instructors of GC-FS Alumni, on the EU-Track web portal.









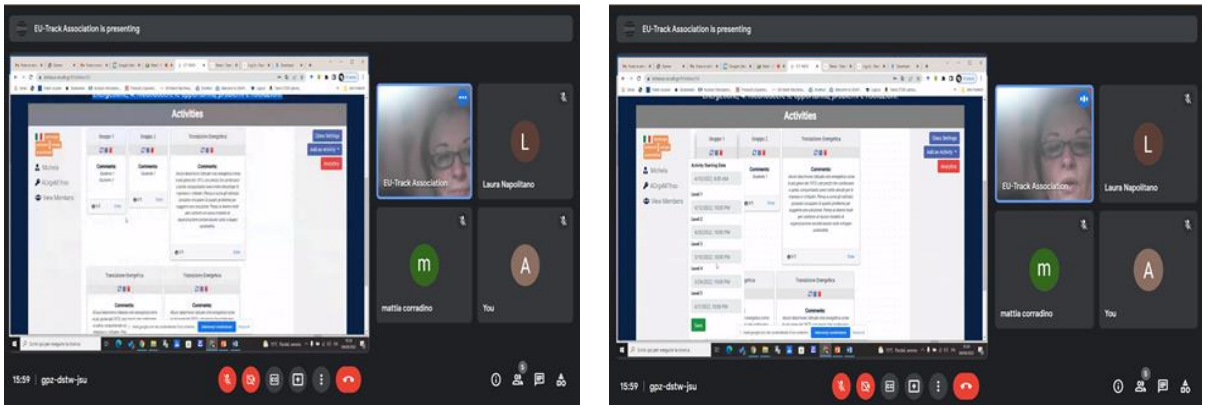


Figure 9. 2nd Instructor Training Event with GC-FS Alumni of Università Degli Studi "La Sapienza", April 4, 2022.

5. Universiti of Malaya

5.1 1st instructor training event series at the University of Malaya, on August 3, August 30, and September 28, 2022

5.1.1 Location, context, time, and duration

A series of events took place on 3 separate dates at the University of Malaya, namely August 3, August 30, and September 28, 2022. The events took place in a hybrid more, virtually and face to face in the lab developed in the context of the ICT-INOV project.

5.1.2 Participants

The events were attended by lecturers from the Faculty of Computer Science and Information Technology, Universiti of Malaya. The participants were from the department of Software Engineering, Information Systems, Computer systems, and Technology and Artificial Intelligence.

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5.1.3 Description of activities

Activities focused on the introduction to the function of the equipment purchased in the context of the ICT-INOV project, namely smart phones, sketch pads, cameras for communication, DIY Robot Set, and IoT devices and sensors.

The workshop started on the August 3, 2022 with the presentation by JutaMas representatives, the providers of ICT-INOV equipment, on the hardware delivered by them for building the ICT-INOV lab, namely smartphones, sketch pads, and cameras. Then on August 30 and September 28, 2022 Micro Concept Tech Sdn Bhd, providers of ICT-INOV equipment, delivered the DIY Robot Set equipment and provided a presentation and demonstration of its use.

Figure 10. 1st series of instructor training at the Universiti of Malaya, August 3 and 30 and September 28, 2022.

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6. Universiti Tenaga Nasional

6.1 1st instructor training at University Tenaga Nasional on June 30, 2021

6.1.1 Location, context, time, and duration

The 1st instructor training at University Tenaga Nasional took place on June 30, 2021. The title of the event was "Design Thinking for Higher Education: Innovation in the Digital Age (Part 1)". The event took place virtually via the Microsoft® Teams platform due to COVID-19 restrictions still enforced in Malaysia.

6.1.2 Participants

The event was attended by 50 lecturers from University Tenaga Nasional and other universities from Malaysia, Thailand, and Indonesia.

6.1.3 Description of activities

The event was a half day workshop covering an overview of the 5 stages in design thinking approach with emphasis of the first 3 stages. The aim of the workshop was to transfer knowledge on design thinking to the participants and to create a pool of instructors who would be implementing the design thinking approach in the courses.

The workshop was delivered by Prof. Dr. Sofri bin Yahya, a professor and design thinking coach from Universiti Sains Malaysia (USM). He is a well-known figure in design thinking in Malaysia who has been practicing and advocating design thinking in higher education.

The workshop started with a briefing on the ICT-INOV project and the role of UNITEN in its implementation, which was presented by the project manager at University Tenaga Nasional, Assoc. Prof. Ts. Dr. Hazleen Aris. During the workshop, participants were given an introduction on the design thinking approach and practical examples on how it can be used to improve and enrich

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the teaching and learning experience, at the same time boosting students' innovation skills. The connection between universities that practice design thinking and the number of unicorns that they produce as shared by Prof. Sofri is proof on the effectiveness of this approach in fostering innovative graduates.

6.1.4 Feedback and web presence

All participants developed valuable skills on design thinking for higher education from Prof. Sofri. The workshop was followed by a 2nd session that was delivered in a month's time to allow participants to think and prepare ideas on implementing design thinking in their courses. More on this workshop can be found at https://www.linkedin.com/pulse/design-thinking-innovation-digital-age-hazleen-aris-1c/. The event was promoted through a campaign, for which a poster is visible below.

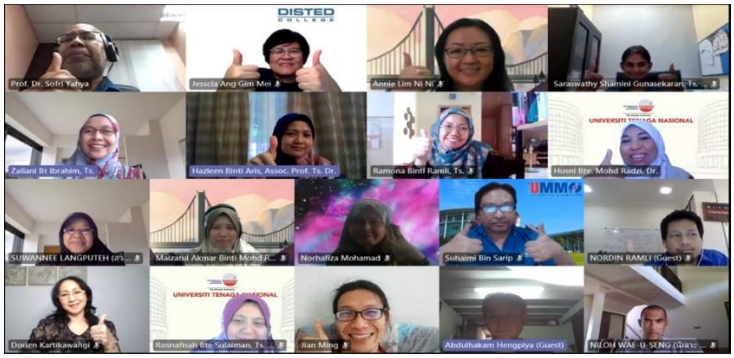

Figure 11. 1st instructor training event at University Tenaga Nasional on June 30, 2021.

6.2 2nd instructor training at University Tenaga Nasional on July 28, 2021

6.2.1 Location, context, time, and duration

The 2nd instructor training event at University Tenaga Nasional was a continuation from the 1st workshop that took place on June 20, 2022. The event took place on July 28, 2022. This workshop was only opened to those who participated in the 1st training.

6.2.2 Participants

The event was attended by joined by 30 lecturers from University Tenaga Nasional and other universities in Malaysia, Thailand, and Indonesia.

6.2.3 Description of activities

Continuing from the 1st session, the 2nd workshop started with a recap of the first three stages of design thinking covered earlier, and subsequently focused on the last two. The session was more interactive as the participants had gained fundamental understanding of design thinking from the previous workshop and were able to contemplate its implementation in their courses.

Participants were able to understand design thinking in depth, including more practical examples on the application of design thinking in higher education. Content of this workshop included the empathy map that helps understand stakeholder needs, the user's journey map, the point-of-view statement, verbing techniques, and product and service prototypes.

During the 2nd half of the workshop, participants had the opportunity to share their planning for the implementations of design thinking in their respective courses and receive feedback by the trainer. Subsequent workshops will focus on the instructors who are seriously considering applying design thinking in their courses where the ICT-INOV platform will also be introduced for hands-on training.

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6.2.4 Feedback and web presence

Participants greatly benefited from the hands-on approach on the practical application of design thinking. The event was promoted through an internal campaign as demonstrated in the poster below.

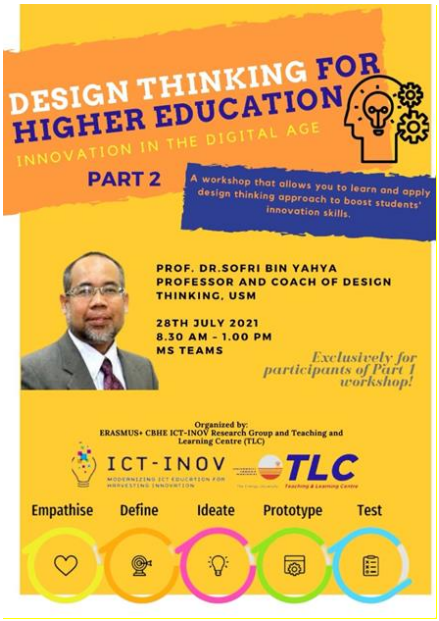

Figure 12. 2nd instructor training event at University Tenaga Nasional on July 28, 2021.

6.3 3rd instructor training event at University Tenaga Nasional on March 11, 2022

6.3.1 Location, context, time, and duration

The 3rd instructor training at University Tenaga Nasional took place on March 11, 2022. The title of the event was “Design Thinking for Impactful Learning”. The event, which was originally planned as a face-to-face activity, took place in hybrid mode due to COVID-19 restrictions still enforced in Malaysia. Those who could make it physically attended the session in the university’s problem-based learning (PBL) room, which is located on level 2, College of Engineering, University

Tenaga Nasional. Online participants and the trainer joined online using the Microsoft® Teams platform.

6.3.2 Participants

The event was attended by 15 lecturers from the College of Computing and Informatics, College of Engineering and College of Business Management and Accounting at University Tenaga Nasional. Participants were potential pilot instructors who will be implementing design thinking approach in their respective classes.

6.3.3 Description of activities

The training mainly targeted instructors of ICT courses, who had expressed interest to implement design thinking techniques in their classes. The trainer was Mr. Chuah Kee Man, a Certified Design Thinking Facilitator from Universiti Malaysia Sarawak (UMS). The training began with a quick recap on design thinking phases in the morning session and after that, the participants were encouraged to engage in hands-on activities to experience all design thinking phases. Participants were exposed to the key elements in creating activities at each phase of the design thinking approach. The session was conducted interactively. Participants had the opportunity to present their ideas and outputs to the trainer and receive feedback. Face-to-face participants used a white board to paste their sticky notes while on-line participants used a software called Jamboard®.

In the afternoon session, the ICT-INOV project manager at University Tenaga Nasional, Dr. Hazleen Aris, presented an early version of the ICT-INOV design thinking platform to the participants. The participants were then asked to register and start creating design thinking activities for their classes, gaining familiarity on the ICT-INOV digital services. The one-day session ended with the commitment from the pilot instructor candidates to try as much as possible to adopt design thinking in their courses based on the knowledge obtained during the training.

6.3.4 Feedback and web presence

A survey form was distributed at the end of the training. In general, the participants enjoyed the training activities. All of them found the workshop useful and were looking forward to implementing design thinking in their classes and to take part in more training sessions soon https://www.linkedin.com/posts/hazleen-aris_agility-covidehi19-designthinking-activity-6907997598670569473-JNih?utm_source=linkedin_share&utm_medium=member_desktop_web.

Figure 13. 3rd instructor training event at University Tenaga Nasional on March 11, 2022.

7 .National University of Computer and Emerging Sciences

7.1 1st instructor training event at the National University of Computer and Emerging Sciences on October 26, 2022

7.1.1 Location, context, time, and duration

An instructor training event took place at the Department of Software Engineering of the National University computer and emerging sciences on October 26, 2022. The event took place in one of the lecture halls of the School of Computing.

7.1.2 Participants

The event was attended by 21 higher education instructors from the Department of Computer Science and Software engineering of the National University computer and emerging sciences.

7.1.3 Description of activities

Participants had the opportunity to be exposed to design thinking and gamification principles, which are the backbone of the proposed ICT-INOV methodological learning approach for developing innovation skills in higher education.

In addition, participants were exposed to examples of exercises that can be deployed in the design thinking process steps of team building, fostering creativity, problem discovery, empathy, problem redefinition, ideation, idea selection, prototyping, and evaluation. They used tools in each step of the design thinking process. For example, in the team building phase they introduced team names and designed team logs, they worked on a team canvas outlining collaboration rules, and they engaged in creative exercises. In the problem definition phase, they defined the problem space. In the discovery phase, they used activities such as a neighborhood walk, which provides diverse viewpoints to a given problem. They further prepared and conducted interviews for understanding user needs. Based on the results, they mapped a user persona using an empathy map that outlines what a user sees, feels, hears, says and does, as well as the user pain and gain. In the ideation phase, they engaged in association building exercises and activities that help

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generate a rich pool of solutions. Finally, students selected one idea for which they developed a low-resolution prototype. They described their solution through a poster.

Finally, the participants experienced a demo of the ICT-INOV learning platform. More specifically, participants were exposed to both the educator and student interfaces. On the educator side, the participants saw how to create an activity, how to post instructions for students for each design thinking steps, the platform analytics, the gamification elements that promote engagement through rewards, the access to the reference manual, the calendar of activities, and more. Furthermore, the participants saw the resource library available in the platform, which includes suggested exercises for each design thinking step from which educators can select ideas for integrating into the activities they design for their students. On the student side, the participants saw how students register to a class, join a team, and participate in design thinking by sharing ideas on a common team working space. In addition, how to ask for help from the instructor and to open the team canvas to the entire class for additional feedback, if so desired.

Participants were further exposed to actual ICT-INOV learning activities developed for the Software Engineering and Technologies in Education courses. These activities have already been used in courses. Participants had the opportunity to see student canvas examples of good practice. In addition, participants discussed activities of interest to students, such as reducing CO2 emissions in data centers.

7.1.4 Feedback and web presence

It was promoted via email to students and faculty members across departments. In all, it was a very productive activity that achieved its goal of promoting the update of project outcomes. The feedback from the participants was very positive, particularly with respect to the proposed design thinking methodology and supporting digital learning services.

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Figure 14. Instructor training event at the National University of Computer and Emerging Sciences on October 26, 2022.

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8. ISRA University

8.1 1st instructor training event, ISRA University, October 21, 2022

8.1.1 Location, context, time, and duration

The 1st instructor training event was organized at the Department of Computer Science, ISRA University on October 21, 2022. The event was organized in one of the general-purpose labs of the Faculty of Engineering, Sciences, and Technology, ISRA University, Hyderabad. All faculty members of the Department of Computer Science were invited to attend the workshop. Final year students were also invited to attend.

8.1.2 Participants

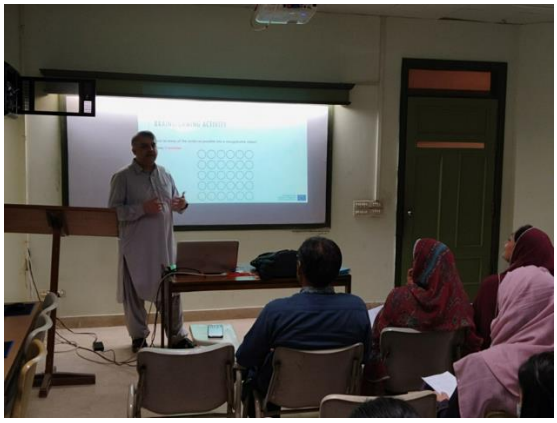
A total of 9 faculty members and 11 final year students of the Department of Computer Science attended the workshop.

8.1.3 Description of activities

The event aimed at familiarizing the faculty members and students with the design thinking process and its use in the classroom environment. The audience was exposed to the steps involved in design thinking-related activities. Faculty members were informed on how they can incorporate design thinking into their courses and day-to-day activities. Students were informed how they can decompose their final year project using design thinking steps and improve project implementation.

8.1.4 Feedback and dissemination

The event was very well received and contributed to the adoption of the ICT-INOV gamified design thinking approach in courses in the context of piloting activities at ISRA University.



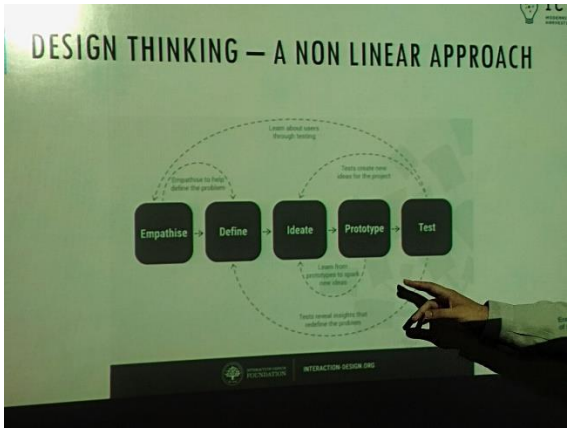


Figure 15. 1st instructor training event at ISRA University, October 21, 2022.

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9. Kathmandu University

9.1 1st instructor training event at the Department of Computer Science and Engineering of Kathmandu University, June 8, 2022

9.1.1 Location, context, time, and duration

The 1st instructor training took place at the Department of Computer Science and Engineering of Kathmandu University, Dhulikhel on June 6, 2022. The event had a duration of one morning.

9.1.2 Participants

The event was attended by 12 faculty and staff members of the Department of Computer and Electrical Engineering of Kathmandu University.

9.1.3 Description of activities

The session was facilitated by Mr. Dhiraj Shrestha, Assistant Professor and ICT-INOV project leader at Kathmandu University.

The training program included 2 sessions. The 1st session provided insight on using the interactive screen in the classroom environment to facilitate collaboration in the context of design thinking. The 2nd session focused on ICT-INOV objectives, and the various resources developed the project to facilitate design thinking in the classroom.

More specifically, the event commenced with an opening remark from Mr. Dhiraj Shrestha, in which he welcomed the participating faculty members and discussed the objectives of the training session. Subsequently, Mr. Mukesh Bhandari provided a demonstration of the interactive display to the faculty members. The demonstration revealed the use of various features provided by the interactive display in making the teaching-learning process more effective and convenient.

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Further, the participants also performed some trials on the screen and explored the benefits of deploying the system in the classroom.

The session continued with highlights of the ICT-INOV project presented by Mr. Shrestha. He presented the project background and goals of promoting innovative thinking among Computer Science and Engineering students. He provided guidelines on using the ICT-INOV digital learning platform. Moreover, Mr. Shrestha discussed design thinking and gamification, and provided practical information on the effective integration of these methodologies in learning design.

He further emphasized the significance of modern technologies in educational institutions and encouraged the participant faculty members to make optimal use of the resources provided by ICT-INOV for incorporating design thinking in the classroom.

9.1.4 Feedback and dissemination

The event was very well received by educators, who commented that the proposed gamified design thinking approach and digital tools can increase interactivity in the classroom and foster the development of innovation skills. The event was disseminated on the Kathmandu University portal at Kathmandu University (ku.edu.np).

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Figure 7. 1st instructor training at the Department of Computer Engineering, Kathmandu University, June 8, 2022.

10. Tribhuvan University

10.1 1st instructor training event at Tribhuvan University, July 5, 2022

10.1.1 Location, context, time, and duration

The 1st instructor training event at Tribhuvan University took place at the ICT-INOV lab in the Center for Energy Studies (CES), Institute of Engineering, Tribhuvan University on 5th July 2022.

10.1.2 Participants

The event was attended by 16 participants, including faculty members, instructors, research assistants and staff.

10.1.3 Description of activities

The main objective of the training was to familiarize faculty members, instructors, and staff with the equipment procured under the ICT-INOV project.

The event started with a welcome remark from the director of the Center for Energy Studies, Prof. Dr. Tri Ratna Bajracharya. Then the participants briefly introduced themselves. The director then gave an overview of the ICT-INOV project and described the equipment obtained in the project and the facilities available in the la He also gave an overview of design thinking, the purpose of the lab, and the objectives of the project.

A technical session followed, which was conducted by the trainers of the equipment provider, BITS Pvt. Ltd. The trainers covered the detailed operation of the Interactive Flat Panel Display, the major equipment procured in the ICT-INOV project. They first demonstrated the basic features and functions of the interactive display that will be frequently used in classes, such as using the whiteboard, making presentations, working with office documents and multimedia files, and more. They trained the participants to use each of the features answering questions in the meantime. Second, they demonstrated more advanced features of the system, such as video conferencing, remote access, installing apps, voting, and others.

Finally, there was a detailed question and answer session with the engagement of the participants. Participants interacted among each other during lunch.

10.1.4 Feedback and web presence

The feedback of the participants was very positive. They demonstrated eagerness to deploy the proposed gamified design thinking methodology in the courses, including the proposed digital learning services and the lab under development.

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Figure 16. 1st instructor training event at Tribhuvan University's Center for Energy Studies, July 5, 2021.

10.2 2nd instructor training event at Tribhuvan University, July 2, 2022

10.2.1 Location, context, time, and duration

The 2nd instructor training event took place in the ICT-INOV lab in the Center for Energy Studies (CES), Institute of Engineering, Tribhuvan University on July 27, 2022. The main objective of the training was to familiarize faculty members and instructors with the ICT-INOV digital learning platform for innovation.

10.2.2 Participants

The event was attended by 21 individuals, including faculty members, instructors, researchers, and staff at Tribhuvan University.

10.2.3 Description of activities

The program started with introductory remarks from the Director of the Center for Energy Studies, Prof. Dr. Tri Ratna Bajracharya. Subsequently, the participants briefly introduced themselves.

The training was delivered by Assistant Prof. Dr. Aman Shakya. The trainer started by giving an overview of the ICT-INOV project and the ICT-INOV gamified design thinking methodology. Then, he presented an overview of the ICT-INOV digital learning platform for innovation with a live

demo. He demonstrated the use of the platform for creating innovation building activities and courses on-line. He further discussed how the ICT-INOV digital learning platform can be integrated into curricula courses. The demo was followed by hands-on trial in which participants used the digital tools.

10.2.4 Feedback and web presence

The training was concluded with a feedback and question-answer session in which the trainer answered questions from the participants. The feedback of the participants was very positive. They demonstrated eagerness to deploy the proposed gamified design thinking methodology in their courses.



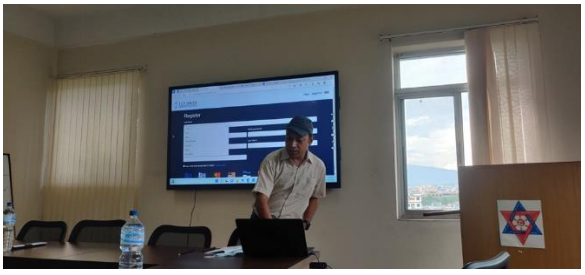


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Figure 17. 2nd instructor training event at Tribhuvan University's Center for Energy Studies, July 27, 2022.

11. Hanoi University

11.1 1st instructor training event at Hanoi University on May 27, 2022

11.1.1 Date and location

The 1st instructor training event at Hanoi University took place at the Faculty of Information Technology on May 27, 2022.

11.1.2. Participants

The event was attended by 13 lecturers from the Faculty of Information and Technology, Hanoi University.

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11.1.3 Description of activities

Activities were coordinated by Dr. Thang Nguyen Xuan, Dean of the Faculty and ICT-INOV project leader at Hanoi University and Ms. Nguyet Dinh Thi Minh, key staff of the project.

The event was organized in 2 main sessions. During the 1st session, Dr. Thang Nguyen Xuan introduced the ICT-INOV project to the audience. He delivered a 20-minute speech on the objectives and goals of the project as well as what has been achieved by the project team recently. Subsequently, Ms. Nguyet Dinh Thi Minh led the 2nd session by providing insight into design thinking. She shared her experience with applying design thinking in her classes in the spring 2021 semester. Finally, she introduced and demonstrated the ICT-INOV gamified design thinking learning platform and demonstrated key features, including account creation, activity creation, course creation, joining classes for students, and more.

After the demonstration, the audience was divided into teams, practicing the creation and deployment of activities on the platform.

Finally, Dr. Thang introduced the ICT-INOV design thinking lab at Hanoi University, emphasizing the objective of using it in courses in the coming semester and encouraging all lecturers to take advantage of the lab and the platform in their educational practices.

B11.1.4 Feedback and web presence

The feedback from the audience was very positive. Participants highlighted the importance of building innovation skills among students. They further discussed the benefits of the ICT-INOV learning intervention and the digital tools developed by the project, including the digital learning platform and physical labs, towards enriching classroom interactivity and promoting student creativity.

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Figure 18. 1st instructor training event at Hanoi University, May 27, 2022.

12. Von Newmann Institute

1st and 2nd instructor training events at Sai Gon University on July 4 - 5 and 11 – 12, 2022

12.1 Date and location

Two training events were organized at Sai Gon University on July 4th and 5th, 2022 and on July 11th and 12th, 2022 respectively. The event venue is in the city center and easily accessible by educators from different institutions.

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11.1.2 Participants

Over 50 instructors attended each of the 2 events. They are the lecturers at universities located in Ho Chi Minh city, including Sai Gon University, HCMC University of Sciences, HCMC University of Education, HCMC University of Technology, and Von Neumann Institute. They all showed their desire to become familiar with the ICT-INOV learning methodology for improving their teaching skills and methods.

11.1.3 Description of activities

In the 1st day of each event the audience was familiarized on a high level with overall design thinking processes and techniques. Participants engaged in a discussion on how the design thinking process and techniques can be applied in ICT higher education to promote innovation and course effectiveness.

In the 2nd day, participants practiced design thinking on applying ICT in educational environments. The purpose of the activities was to demonstrate how to apply design thinking to solve problems during courses in the context of problem-based learning for the benefit of participating lecturers and also for the benefit of students.

During the training sessions, instructors were asked to solve the problem of building new ICT services for a smart university. They were split into 6 groups of 8 to 10 individuals. At first, participants formed teams based on their common viewpoints or interests regarding the topic. However, the organizers considered that teams would be more effective if they represented multiple viewpoints. For this reason, participants were reassigned to teams randomly.

In the resulting teams, members were naturally not familiar with each other. They engaged in mini games for team building purposes and for breaking the ice before engaging in design thinking steps, such as problem discovery, empathy, problem redefinition, ideation, idea selection, prototyping, and evaluation. Each group presented their ideas and alternative potential solutions.

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Teams selected solution for prototyping and received feedback from the entire group. Team members drew their suggested solution on paper as a form of low fidelity prototype. Finally, participants discussed under the supervision of Von Neumann Institute' presenter how to tailor the process to adapt it to different contexts in classes and subjects.

The materials that are provided by the ICT-INOV project were translated into Vietnamese for ease of use by all participants. It would be useful for further application in the universities for both lecturers and students who may not have a working knowledge of English.




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Figure 19. 1st and 2nd instructor training events at Sai Gon University, July 4 – 5 and 11 – 12, 2022. The first 3 photos correspond to the 1st event and the rest to the 2nd.

11.2 3rd instructor training event at the University of Banking September 7, 2022

11.2.1 Date and location

The training event was organized at Innovation Hub of University of Banking on September 7, 2022.

11.2.2 Participants

A total of 10 participants attended the event. The participants were lecturers from the University of Banking. They deliver ICT courses in the programs of MIS and e-Commerce. They are very active and experienced in how to apply problem-based learning and gamification in classes.

11.2.3 Description of activities

The event had 2 main parts. In the 1st part of event the audience was familiarized on a high level with overall design thinking processes and techniques. Participants engaged in a discussion on how the design thinking process and techniques can be applied in ICT higher education to promote innovation and course effectiveness.

In the 2nd part, participants practiced design thinking on applying ICT in educational environments. The purpose of the activities was to demonstrate how to apply design thinking to solve problems during courses in the context of problem-based learning for the benefit of participating lecturers and also for the benefit of students.

The audience was encouraged to apply design thinking in real-life contexts. Participants were asked to define and solve problems in the banking environment with new IT services towards a smart bank. Participants were split into 2 groups of 5 individuals. The teams were formed randomly. Activities started with team building. Team members engaged in mini games for becoming familiar with each other and breaking the ice. Subsequently, they applied design thinking techniques, such as problem discovery, empathy, problem redefinition, ideation, idea selection, prototyping, and evaluation. Each group presented their ideas and alternative potential solutions. Teams selected a solution for prototyping and received feedback from the entire group. Team members drew their suggested solution on paper as a form of low fidelity prototype. Finally, participants discussed under the supervision of Von Neumann Institute' presenter how to tailor the process to adapt it to different contexts in classes and subjects.

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As in the earlier instructor training events, participants used ICT-INOV materials translated to Vietnamese.

Figure 20. Educators of the University of Banking in the 3rd instructor training event, September 7, 2022.

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Conclusions

This document constitutes a mid-project progress report on instructor training activities at partners sites in the context of Work Package 3: Implementation. The description demonstrates that instructor training is already underway at all partner sites and that it is an on-going process that will span second half of the project implementation period with the objective of promoting the capacity of organizations to adopt the proposed gamified design thinking approach. The report will be updated at the end of the project implementation period to include all training activities.

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