



D3.4 Report on instructor training at partner sites

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ICT-INO

MODERNIZING ICT EDUCATION FOR
HARVESTING INNOVATION

D3.4 Report on instructor training at partner sites

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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 students' capacity to 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 the technology's feasibility, viability, and maturity. 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 students' long-term engagement 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, digital learning infrastructures, and educational content. It further delivers instructor training and organizes community-building events to build 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 in Porto and Hanoi and constitutes 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. This on-going instructor

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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 summarises 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 1st 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

The 1st instructor training event occurred 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, post instructions for students for each design thinking step, the platform analytics, the gamification elements that promote engagement through rewards, access to the reference manual, the calendar of activities, and more. Furthermore, the audience saw the resource library available on the platform. It 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 for a class, join a team, and participate in design thinking by sharing ideas in 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.

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 centres.

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 into 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 \(ictinov-project.eu\)](https://www.ictinov-project.eu/27/5/2022), which also includes the presentation delivered.

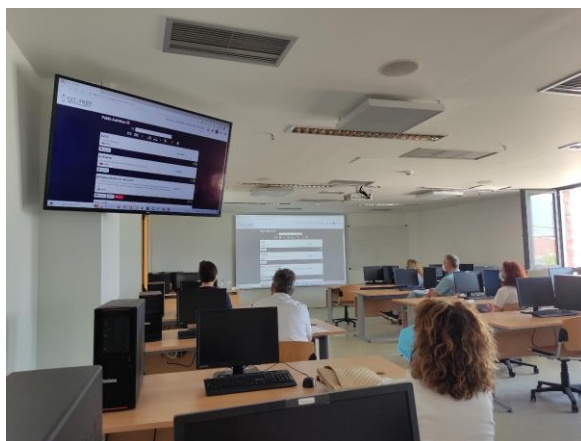
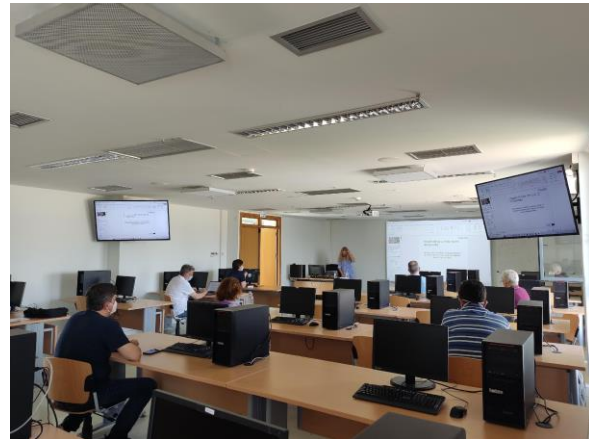
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The event was promoted via email to all faculty members, both permanent and recurring, of the Department of Electrical and Computer Engineering of the University of Thessaly. The event is disseminated on the portal of the Department of Electrical and 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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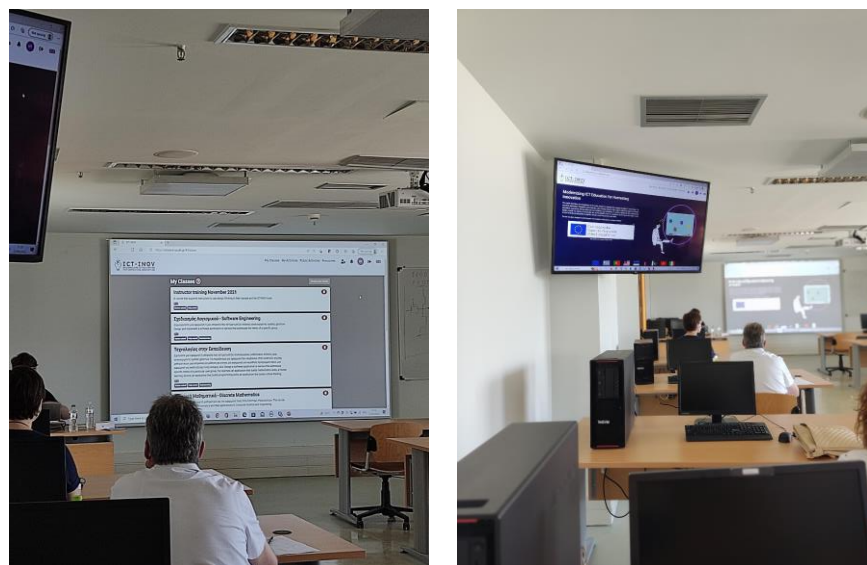


Figure 1. 1st instructor training event at the Department of Electrical and Computer Engineering, University of Thessaly, May 27, 2022.

1.2 2nd 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.

1.1.2 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.

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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 to use, promoting the uptake of project outcomes beyond the consortium.

1.2.4 Feedback and dissemination

The feedback from the audience was overwhelmingly positive. Participants commented that the proposed learning intervention can be integrated with serious games to build 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 \(uth.gr\)](https://www.facebook.com/permalink.php?story_fbid=pfbid0fy8gHPkVi4XoAgsrjZ4HuPrChSoAgGGQGUX5zj28CPFFhqDPxH1DyoCPcCM1dkGBl&id=100057213949197) and on the group's social media pages at the address https://www.facebook.com/permalink.php?story_fbid=pfbid0fy8gHPkVi4XoAgsrjZ4HuPrChSoAgGGQGUX5zj28CPFFhqDPxH1DyoCPcCM1dkGBl&id=100057213949197.

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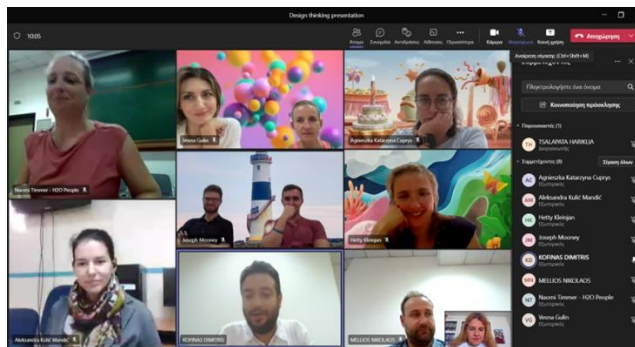


Figure 2. 2nd instructor training event at the University of Thessaly Department of Civil Engineering, October 11, 2022.

1.3 3rd instructor training targeting the Hellenic Open University, December 9, 2022

1.3.1 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.

1.3.2 Participants

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

1.3.3 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 and had the opportunity to contemplate the deployment of design thinking 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.

1.3.4 Feedback and dissemination

The feedback from 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.

1.4 4th instructor training to the University of Thessaly community in the context of the Department of Civil Engineering lecture series, May 3, 2023

1.4.1 Location, context, time, and duration

The 4th instructor training was organized in collaboration with the Department of Civil Engineering of the University of Thessaly on May 3, 2023. The event was organized in hybrid mode and lasted 1 hour. The event was streamed live through YouTube® and the Diavlos platform in two parallel streams. It was also delivered through MSTeams®.

1.4.2 Participants

The event was attended by over 30 individuals, educators at the Department of Civil Engineering and more. In addition, the event video continues to be available on-line in YouTube®, allowing more individuals to view it anytime and increasing the number of individuals exposed to the content.

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1.4.3 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, were exposed to exercises and activities that students can engage in each of the design thinking steps for building insights and fostering collaboration towards solution development, and were exposed to the project implementation, including the digital learning labs developed at partner universities in Asia and the digital learning platform.

1.4.4 Feedback and dissemination

The feedback from the audience was very positive. Participants were interested in how design thinking can be adapted to diverse innovation-fostering scenarios. They further discussed how innovation is linked to AI and AI tools and how this technology can boost or support efforts to design innovative solutions.

The event was promoted via email to the entire University of Thessaly academic community list, which includes 40.000 individuals. In addition, the event was promoted through the University of Thessaly portal at [Σχεδιαστική σκέψη για καινοτομία | Πανεπιστήμιο Θεσσαλίας \(uth.gr\)](#), the Creative Technologies Learning Lab portal, and the Creative Technologies Learning Lab social media pages at [\(2\) An instructor training event... - Creative Technologies Learning Lab | Facebook](#). The presentation is still available on YouTube® at [\(125\) Σχεδιαστική σκέψη για καινοτομία - YouTube](#).

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1.5 5th instructor training at the Evening Vocational High School of Volos, March 8, 2024

1.5.1 Location, context, time, and duration

The 5th instructor training was organized in collaboration with Evening Vocational High School of Volos on March 8, 2024. The event took place at the premises of the vocational school in the context of normal school operations. The had a duration of 2 hours. The purpose of the event was to train educators at the Evening Vocational High School of Volos on good learning practices.

1.5.2 Participants

The event was attended by 10 educators of the Evening Vocational High School of Volos, who observed teaching delivered by the University of Thessaly team directly to the school's students. The number of students who participated in the activity was 20.

1.5.3 Description of activities

The event had the format of a workshop. University of Thessaly researchers delivered a full design thinking session over the course of 2 hours. Educators observed the learning delivery in the context of planned training on emerging learning practices. The event contributed to the professional development of educators. During the event, 20 school students participated in the design thinking session. The general context of the session was sustainability, namely, students were encouraged to use design thinking to synthesize innovative solutions to responsible environmental behaviour.

Students worked in groups of 3 – 4 individuals. Initially, they engaged in creativity exercises to build their confidence in their problem-solving skills. Then, they participated in team-building exercises to break the ice and facilitate collaboration. Students performed internet research on the general subject of sustainability, downloading articles and images. Based on their findings, they defined accurately the problem they wished to work on. They engaged in ideation exercises

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in their teams, with team members writing ideas on a paper and building on the ideas of their peers. Finally, they evaluated their idea and selected one, which they presented to the entire class.

1.5.4 Feedback and dissemination

The feedback from the audience was very positive. Both students and educators found the design thinking process very positive.

The event was promoted via a bulletin delivered by the Evening Vocational High School of Volos to students and educators in the school. In addition, the school reported the event to the Secondary Education Authorities of Magnesia, where the town of Volos is located, in the context of planned educator training for career development. Finally, the event was promoted through the portal of the Creative Technologies Learning Lab of the University of Thessaly at the address [ICT-INOV educator training at the Evening Vocational High School of Volos 8/3/2024 \(uth.gr\)](https://www.uth.gr/ict-inov/educator-training-at-the-evening-vocational-high-school-of-volos-8-3-2024) as well as through the social media pages of the Creative Technologies Learning Lab at the address [\(4\) An instructor training event was delivered... - CBHE Project Ict-Inov | Facebook](https://www.facebook.com/ict-inov).



Figure 4. 5th instructor training event organized by the University of Thessaly at the Evening Vocational High School of Volos, March 8, 2024.

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2. Porto Polytechnic

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

2.1.1 Location, context, time, and duration

A 1st instructor training event took place at the Engineering School of the Porto Polytechnic on the 16th of November of 2022. The event included a mix of theoretical and practical applications.

2.1.2 Participants

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

2.1.3 Description of activities

The event was divided into 2 sessions. The first session involved a presentation of theoretical concepts on active learning, design thinking, and gamification and a presentation of related projects. The 2nd session focused on practising using the ICT-INOV gamified digital learning platform.

On the educator side, the audience had 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 accessed 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 experienced how students register for a class, join a team, and participate in design thinking by sharing ideas in 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.

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

Documents used included presentations describing design thinking and gamification in general and the ICT-INOV project objectives in particular. The ICT-INOV platform was used by the participants.

2.1.4 Feedback and dissemination

The event was 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.



Figure 5. 1st instructor training at Porto Polytechnic, November 16, 2022.

2.2 2nd instructor training event at Porto Polytechnic, April 24, 2023

2.2.1 Location, context, time, and duration

As part of a training event on active learning and gamification with Polish teachers, the 2nd instructor training event occurred at the Engineering School of the Porto Polytechnic on April 24, 2023. The event was organized in a mix of theoretical and practical applications.

2.2.2 Participants

The event was attended by 17 teachers from different VET and secondary schools in Poland.

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2.2.3 Description of activities

The event was comprised of 2 parts:

- An introductory session on active learning, design thinking, and gamification.
- Hands-on engagement with the ICT INOV platform, demonstrating its functionalities for both educators and students.

Educators were shown how to create activities, provide step-by-step instructions for design thinking, analyze platform data, utilize gamification for student engagement, access the reference guide, manage the activity calendar, and more. Additionally, the platform's resource library, offering a variety of exercises for each step of design thinking, was presented for educators to integrate into their student activities.

From the student perspective, the demonstration covered class registration, team formation, and participation in design thinking through a shared workspace for idea exchange. The presentation also highlighted how students can request instructor assistance and share their team's canvas with the class for further input.

Documents used included presentations describing design thinking and gamification in general and the ICT-INOV project objectives in particular. The ICT-INOV platform was used by the participants.

2.2.4 Feedback and dissemination

The event was 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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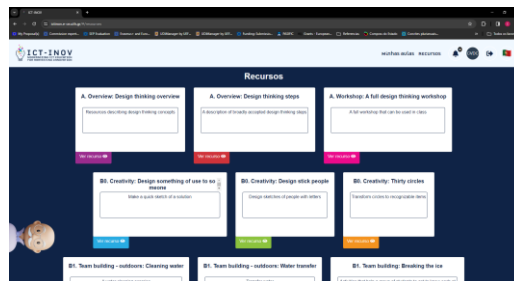


Figure 6. 2nd instructor training event at Porto Polytechnic, April 24, 2023.

2.3 3rd instructor training event at Porto Polytechnic, June 16, 2023

2.3.1 Location, context, time, and duration

A third instructor training event took place at the Engineering School of the Porto Polytechnic on the 16th of June, 2023. The event followed the same organization as the first instructor event and was organized with a mix of theoretical and practical applications.

2.3.2 Participants

The event was attended by 19 teachers and researchers of the school of engineering of the Porto Polytechnic.

2.3.3 Description of activities

The event started with a theoretical explanation of active learning, design thinking, and gamification principles, along with the presentation of projects utilising these concepts.

Subsequently, the event focused on practical experiences with the ICT-INOV platform. It showcased the platform's capabilities from both the educator's and the student's viewpoints.

For educators, the demonstration included setting up an activity, providing detailed instructions for design thinking phases, viewing platform analytics, engaging students through gamification strategies, accessing a comprehensive reference guide, managing a schedule of activities, and

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more. The platform's resource library, which offers a selection of exercises tailored to design thinking stages for educators to incorporate into student activities, was also highlighted.

For students, the presentation showed the process of class registration, team joining, and collaboration on design thinking projects through a shared workspace. It also covered the procedure for students to seek instructors' help and broaden their team discussions by sharing their work with the entire class for additional feedback. The audience also accessed the current ICT-INOV activities developed in Portugal and in other countries.

Documents used included presentations describing design thinking and gamification in general and the ICT-INOV project objectives in particular. The ICT-INOV platform was used by the participants.

2.3.4 Feedback and dissemination

The event was presented on the Engineering School portal. It was promoted through a mailing list that included all the professors and researchers of the school.

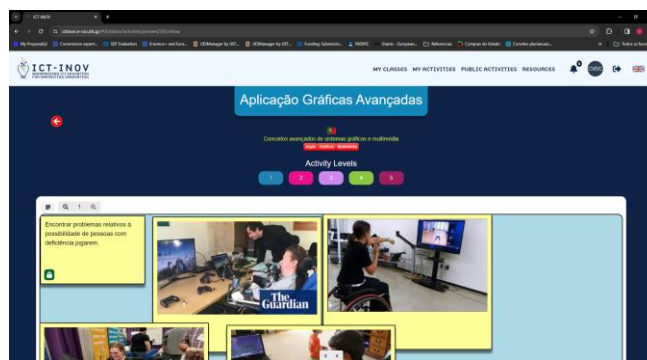


Figure 7. 3rd instructor training event at Porto Polytechnic, June 16, 2023.

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2.2.4 4th instructor training event at Porto Polytechnic, July 19, 2023

2.4.1 Location, context, time, and duration

As part of a training event on active learning and gamification with teachers from several European countries, the 4th instructor training event took place at the Engineering School of the Porto Polytechnic on July 19, 2023. The event was organized in a mix of theoretical and practical applications.

2.4.2 Audience

The event was attended by 14 teachers from different VET and secondary schools from different European countries.

2.4.3 Description of activities

The event started with a brief presentation of theoretical concepts about active learning, design thinking, and gamification. Then, participants practised using the ICT-INOV platform, experiencing both the educator and student interfaces.

On the educator side, the audience was able to see how to create an activity, post instructions for students for each design thinking step, 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 accessed 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 for a class, join a team, and participate in design thinking by sharing ideas in 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.

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Documents used included presentations describing design thinking and gamification in general and the ICT-INOV project objectives in particular. The [ICT-INOV platform](#) was used by the participants.



Figure 8. 4th instructor training event at Porto Polytechnic, July 19, 2023.

2.5 5th instructor training event at Porto Polytechnic, January 23, 2024

2.5.1 Location, context, time, and duration

A 5th instructor training event took place at the Engineering School of the Porto Polytechnic on January 23, 2024. The event followed the same organization as the 1st instructor event and was organized in a mix of theoretical and practical applications.

2.5.2 Participants

The event was attended by 17 teachers and researchers of the school of engineering of the Porto Polytechnic.

2.5.3 Description of activities

The event was divided into 2 sessions:

The 1st session involved a presentation of theoretical concepts about active learning, design thinking, and gamification and a presentation of related projects.

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The 2nd session involved practice with the ICT-INOV platform. Participants experienced the educator and student interfaces.

On the educator side, the audience was able to see how to create an activity, how to post instructions for students for each design thinking step, 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 accessed 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 for a class, join a team, and participate in design thinking by sharing ideas in 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.

The audience also saw the current ICT-INOV activities developed in Portugal and other countries.

Documents used included presentations describing design thinking and gamification in general and the ICT-INOV project objectives in particular. The [ICT-INOV platform](#) was used by the participants.

2.5.4 Feedback and dissemination

The event was presented on the Engineering School portal. It was further disseminated through a mailing list that included all the professors and researchers of the school.

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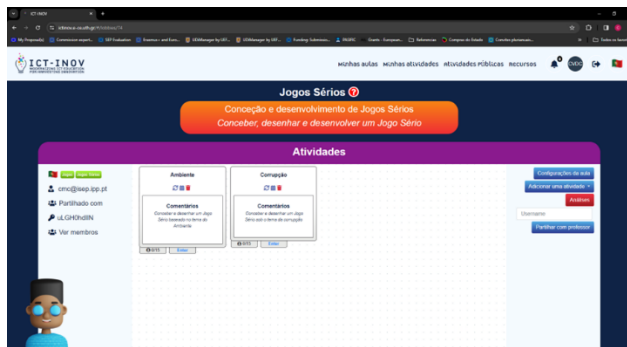


Figure 9. 5th instructor training event at Porto Polytechnic, January 23, 2024.

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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 organization's weekly seminar, in which innovative ideas were 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 project presentation 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 the 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 with 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.

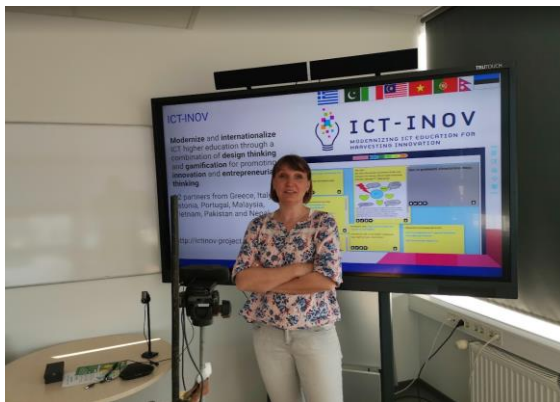
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Finally, participants used the platform as teachers, exploring the functionality of the teacher interface. More specifically, the audience developed familiarity with creating a new activity, posting instructions for students for each design thinking 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.



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Figure 10. 1st instructor training event at Tallinn University, April 18, 2022.

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3.1.4 Feedback and dissemination

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 enrol in. The project is usually coordinated by university staff. The ELU seminars are organized twice a year. They have a workshop format in which ELU supervisors build new skills and become familiar with new tools. The event occurred at the ELU study area, an open space designed for collaborative work with no stationary computers. The event lasted 3 hours with a half-hour break in the middle.

3.2.2 Participants

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

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 on why design thinking is useful in ELU projects, and Triinu Jesmin continued by introducing the 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 students and educators. In addition, participants were exposed to a specific class in the ICT-INOV digital learning platform that has been developed to support an ELU project. The audience had the opportunity to 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, discussion and sharing of informational material.

3.2.4 Feedback and dissemination

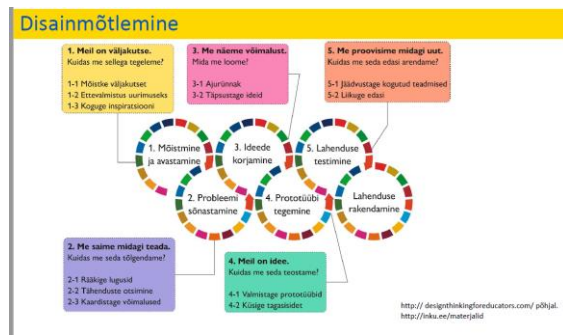
The feedback on the event was very positive. Some instructors opted to use the ICT-INOV platform in their student projects, and some asked for additional individual help with the platform functionality. The ELU coordinator requested the organization of a further similar training event for staff.



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Figure 11. 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. This approach 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.

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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 to the design thinking methodology. Subsequently, the ICT-INOV project and portal were presented, and the functionality of the ICT-INOV platform was showcased from the students' point of view. 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 dissemination

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 12. 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 on October 14, 2022, as part of the Euneos teacher training course, which constitutes in-service training for teachers. The event has been organised yearly since 2006 and has many partners around Europe. The event occurred 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 lasted 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, the 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 deploying 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 a hands-on activity. Participants engaged in exercises as students and had the opportunity to experience 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. Participants created student accounts for

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

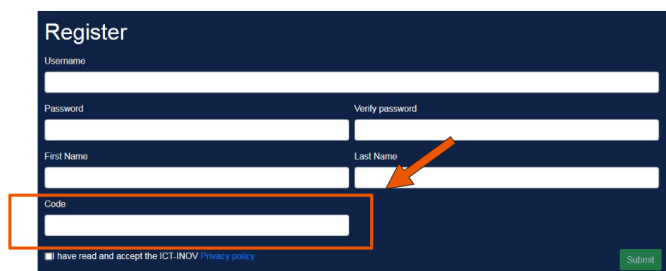
Finally, the participants logged into the ICT-INOV digital learning platform as educators. They experienced how to create learning activities that guide students to collaborate through systematic thinking to address difficult problems. They explored the platform's teamwork features and became familiar with the functions of researching and adding notes to the digital workspace in the context of collaboration, further developing an understanding of the student and educator experience. Participants were provided tips and good practice suggestions on using 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 dissemination

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 sent to them along with information on using the platform.



Teacher's code: ICT1NOVTE4CHER



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Please fill a questionnaire for
feedback!

<https://bit.ly/3rPedDm>

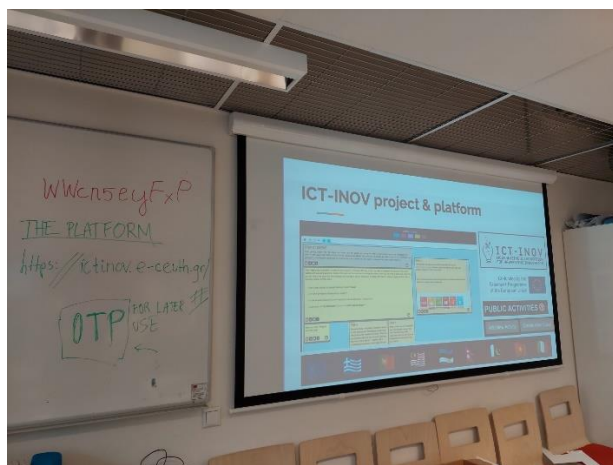


Figure 13. Pictures from the 4th instructor training event at Tallinn University, October 14, 2022.

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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 EU-Track 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.

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 on 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

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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's point of view, participants were encouraged to join a specific class and group, post ideas in their workspace, and, in general, navigate the diverse services. The audience was also exposed to educational activities developed on 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).

4.1.4 Feedback and dissemination

The participants provided positive feedback on the ICT-INOV gamified design thinking methodology and the digital learning platform. Even for participants who 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](#)[®].

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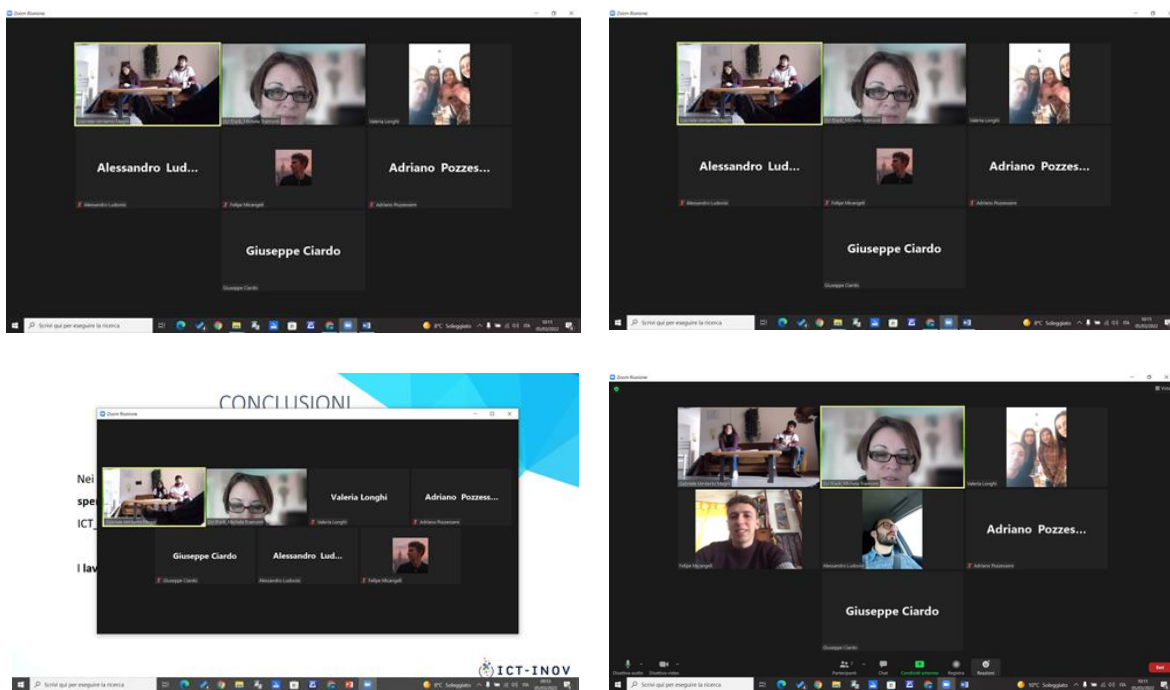


Figure 14. 1st instructor training event with GC-FS Alumni of Università Degli Studi “La Sapienza”, March 4, 2022.

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 from GC-FS Alumni of Università Degli Studi “La Sapienza” attended the event.

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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 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.

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

4.2.4 Feedback and dissemination

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.

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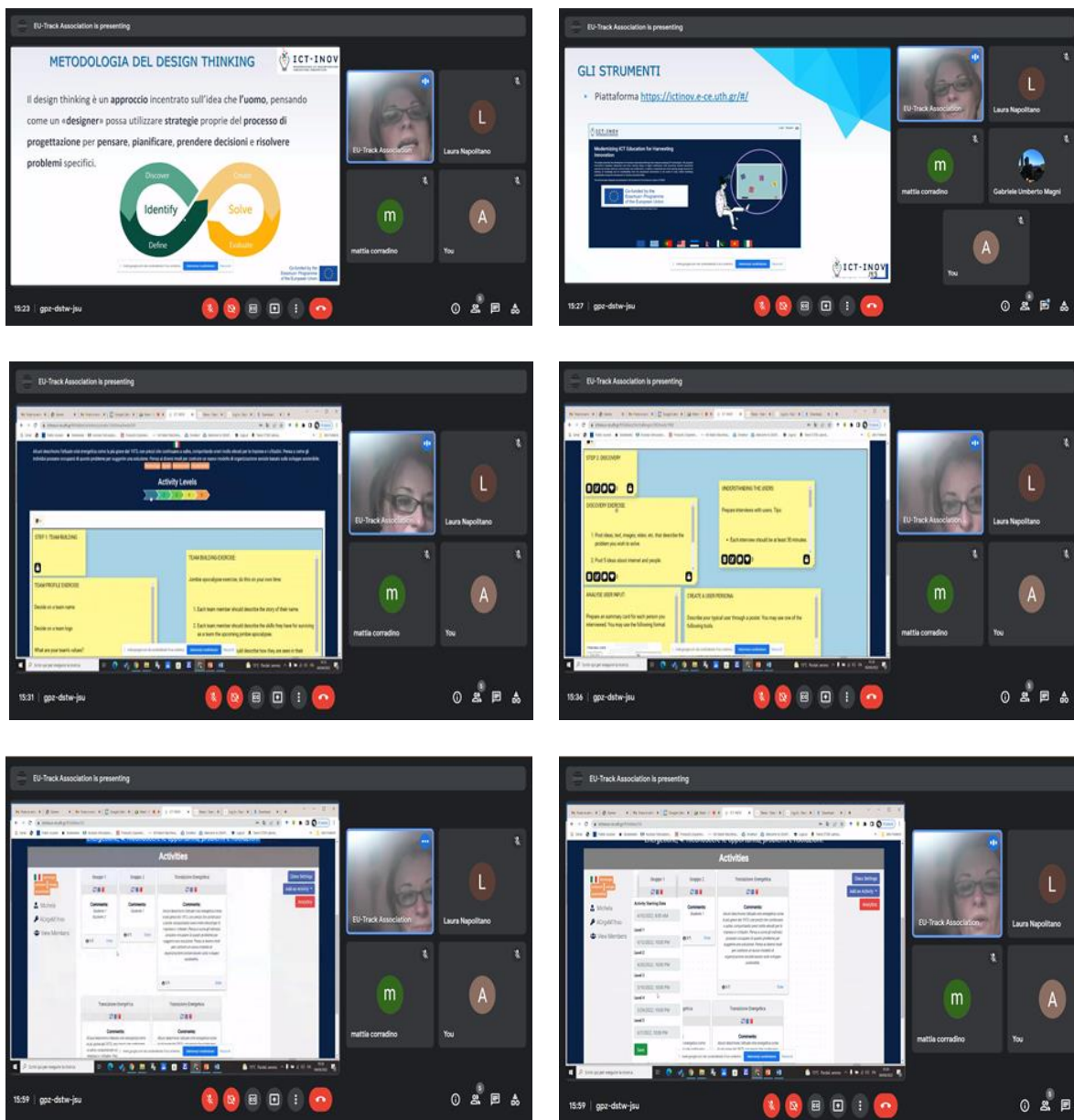


Figure 15. 2nd instructor training event with GC-FS Alumni of Università Degli Studi “La Sapienza”, April 4, 2022.

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4.3 3rd instructor training event jointly organized with SCIENTIX for the Science Project On-line Workshop 16 (SPOWs) from March 6th – 20th, 2023

4.3.1 Location, context, time, and duration

The 3rd instructor-training event, titled “ICT-INOV methodology for innovators”, took place on-line using MTeams®. The event was co-organized by EUTrack and SCIENTIX in the context of Science On-line Workshop 16 over the period March 6 – 20, 2023.

4.3.2 Participants

A total of 20 educators from different European countries attended the event.

4.3.3 Description of activities

Participants had the opportunity to become familiar with the design thinking methodology and the ICT-INOV project objectives, methodology, and tools for developing innovation skills.

The agenda of the event was as follows:

- Week 1, Monday 06 March 2023 (17:00-18:00 CET), 1-hour webinar, introduction and workshop presentation.
- Week 2, Monday 13 March 2023 (17:00-18:30 CET), online session of 1.5 hours.
- Between sessions 1 and 2, asynchronous homework for participants.
- Week 3, Monday 20 March 2023 (17:00-18:30 CET), online session of 1.5 hour.

The design thinking methodology and the steps of empathy, definition, ideation, prototyping, and testing were introduced during the first session of the event. As homework, the participants were expected to create an account as a student in the ICT-INOV digital learning platform and to check the platform functionality for students.

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During the second training session the ICT-INOV platform was demonstrated, including functionality useful to manage the design thinking process through the creation of on-line activities especially introduced for the workshop.

By the end of the event, participants could access and test the digital learning platform functionality from both the teacher and student perspective through practical examples. Specifically, from the student's point of view, participants learnt how they could join a class and a team, post, and navigate in general. From the teacher's point of view, they learnt how to manage learning activities on the platform and organize student work in small groups.

The event concluded with a final discussion and open questions that gave the participants the information needed to initiate their activities with their students.

4.3.4 Feedback and dissemination

Participants provided positive feedback on the ICT-INOV methodology and digital learning platform. Some educators stated their intention to use both the project methodology and platform with their students by also using examples of learning scenarios that are already publicly available.

The event was promoted through social networks on EU-Track and SCIENTIX profiles, such as https://twitter.com/scientix_eu/status/1629783330689277952.

More information is available at the [3rd Instructor Training Event - ICT INOV Project](#).

The event was promoted via e-mail, social networks, and the EU-Track web portal.

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4.4 4th instructor training with instructors and educators from different institutions on December 6, 2023

4.4.1 Location, context, time, and duration

The 4th instructor-training event took place on December 4, 2023, in a face-to-face event with a duration of 2 hours. The aim of the event was to promote the ICT-INOV objectives, demonstrate how the design thinking methodology works, and show the functionality of the ICT-INOV platform.

4.4.2 Participants

A total of 20 instructors and educators from different institutions at different educational levels attended the training event.

4.4.3 Description of activities

The event opened with a presentation of ICT-INOV project objectives, which familiarized participants with the steps of the gamified design thinking approach. The presentation was focused on the possibility of creating innovation in classes by encouraging students to use creativity and high-skill problem-solving. In particular, the phases of team building, problem discovery, empathy, ideation, prototyping, and testing were presented.

Subsequently, the ICT-INOV platform was demonstrated by introducing key functionality and use in the framework of the project methodology implementation through practical scenarios already deployed by students.

Finally, a discussion group was organized to collect feedback and comments on the current use of gamified design thinking methodology and tools developed in the ICT-INOV project timeline and their integration into the training curricula.

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4.4.4 Feedback and dissemination

Participants provided positive feedback on the methodology and the platform. According to comments, the only challenge that could impact the teaching experience is the non-interrupted availability of an internet connection. Should connectivity be interrupted, participants suggested continuing the process off-line.

More information is available at the 2nd instructor training event - the ICT_INOV project, where the presentation is also [available](#).

The event was promoted via e-mail to the participants and on the EU-Track web portal.



Figure 16. 4th instructor training event at EUTrack, December 6, 2023.

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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, virtual and face-to-face in the lab developed in the context of the ICT-INOV project.

5.1.2 Participants

Lecturers from the Faculty of Computer Science and Information Technology, Universiti of Malaya, attended the events. The participants were from the Departments of Software Engineering, Information Systems, Computer Systems, Technology, and Artificial Intelligence.

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 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 presented and demonstrated its use.

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5.1.4 Feedback and dissemination

The workshop was very well accepted by participants, who became familiar with the ICT-INOV digital learning lab and the equipment purchased through the project for enriching innovation-related learning activities.



Figure 17. 1st series of instructor training at the Universiti of Malaya, August 3 and 30 and September 28, 2022.

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5.2 2nd instructor training event series at the University of Malaya, March 22 – 23, 2023

5.2.1 Location, context, time, and duration

The 2nd instructor training workshop at the University of Malaya took place on March 22 – 23, 2023. The event was organized in a hybrid mode. The Design Thinking Lab in the Faculty of Computer Science and Information Technology was the venue for the physical session.

5.2.2 Participants

The event was attended by 15 lecturers from the Faculty of Computer Science and Information Technology, Universiti of Malaya. The participants were from the Department of Software Engineering.

5.2.3 Description of activities

The participants were involved in activities related to design thinking. They were actively engaged in design thinking practices of empathy, problem definition, ideation, design, prototyping, and testing. Participants used the ICT-INOV digital learning platform for collaboration and team work. The challenge that participants were exposed to was related to emerging widespread AI technology, such as ChatGPT and post-COVID-19 pandemic on-line remote learning services, which introduce new challenges in student class engagement as a result of education-related risks, including plagiarism, harmful and biased content, ethics, misuse of AI, and overreliance on tools for assignments. Technology is positive, but if it is not properly integrated into educational practices, it may affect critical thinking, problem-solving skills, learning motivation, and student capacity to think, create, improve, and innovate. One-size-fits-all solutions do not seem to work anymore, as students have unique gifts, passions, and talents. Participants were challenged to design products to assist learning experiences for students to develop their individual capabilities while having fun.

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5.2.4 Feedback and dissemination

The workshop was very well accepted by participants, who were highly engaged and perceived the event as very useful. The event was promoted through the University of Malaya email lists. The presentation used during the event to guide the active engagement of participating educators is available at ictinov-project.eu/wp-content/uploads/2023/07/DT-workshop-v4.pdf.

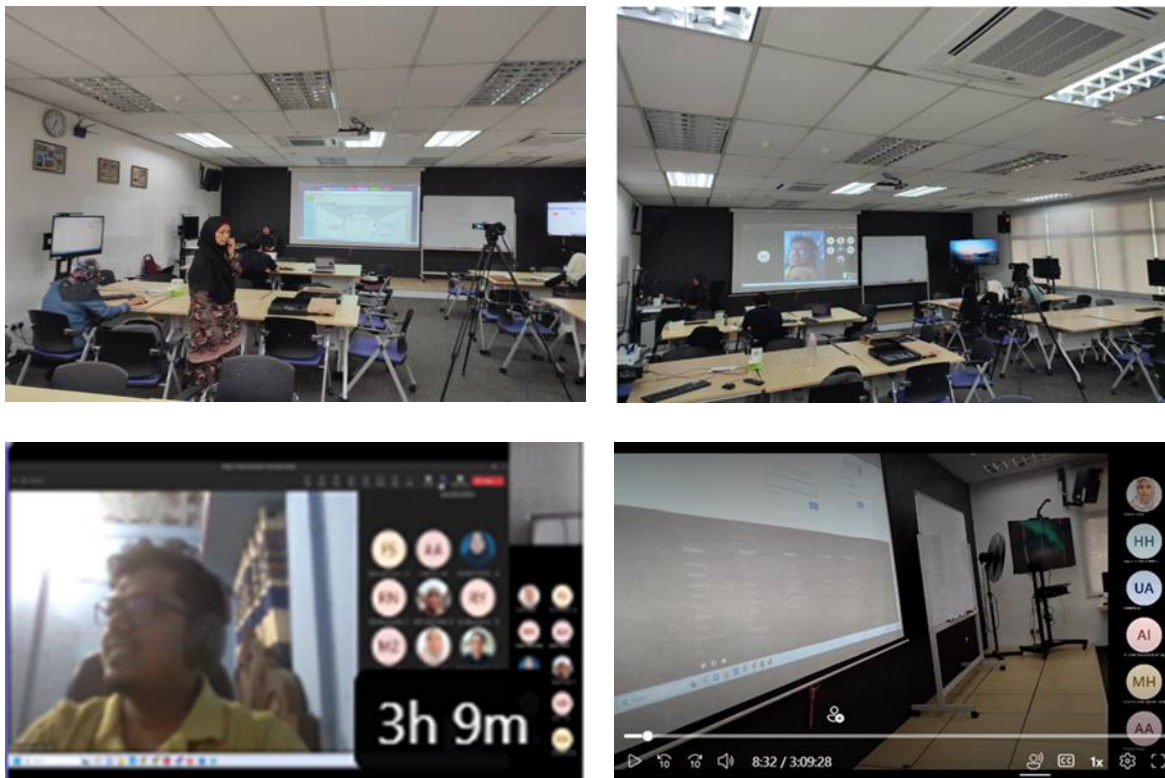


Figure 18. 2nd series of instructor training at the Universiti of Malaya, March 22 – 23, 2023.

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5.3 3rd instructor training event series at the University of Malaya, July 4 – 5, 2023

5.2.1 Location, context, time, and duration

The 3rd instructor training workshop at the University of Malaya took place on July 4 – 5, 2023. The event was organized in a hybrid mode. The Design Thinking Lab in the Faculty of Computer Science and Information Technology was the venue for the physical session.

5.3.2 Participants

The event was attended by 9 lecturers from the Faculty of Computer Science and Information Technology, Universiti of Malaya. The participants were from the Departments of Artificial Intelligence, Software Engineering, Information Science, and Engineering. Their countries of origin were China, Iran, Bangladesh and Malaysia.

5.3.3 Description of activities

Initially, the participants were given an overview of design thinking definitions, examples, and templates before being asked to complete each stage as a group. The participants completed several activities, including ice breaking, completing an empathy map, persona canvas, point of view, “how might we” questions, designing a prototype, and eventually testing their prototype. All activities were hands-on and physical. The participants concluded the workshop by presenting their ideas as a demonstration (roleplaying and idea presentation) and a poster. Subsequently, participants were actively engaged in activities related to design thinking, including empathy, problem definition, ideation, design, prototyping, and testing. Participants used the ICT-INO digital learning platform for collaboration and teamwork. During the event, participants were asked to focus on the challenge of creating meaningful educational experiences for students in the face of emerging AI. The challenge was the same as that used during the instructor training session on March 22 – 23, 2023, described in the previous section.

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5.3.4 Feedback and dissemination

The workshop was very well accepted by participants, who were highly engaged and perceived the event as very useful. The event was promoted through the University of Malaya email lists. The presentation used during the event to guide the active engagement of participating educators is available at ictinov-project.eu/wp-content/uploads/2023/07/DT-workshop-v4.pdf.

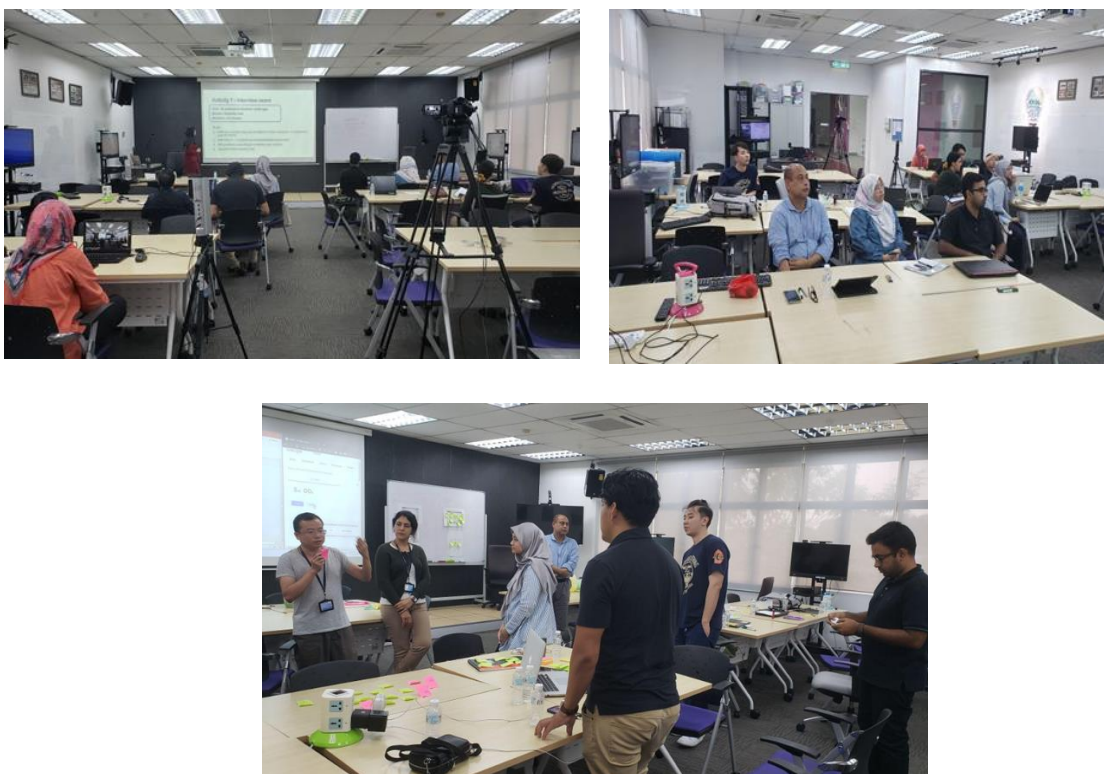


Figure 19. 3rd instructor training event at the University of Malaya, July 4 – 5, 2023.

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5.4 4th instructor training event series at the University of Malaya, August 20 - September 1, 2021

5.4.1 Location, context, time, and duration

The event took place virtually.

5.4.2 Participants

The event was attended by 11 lecturers from the Faculty of Computer Science and Information Technology, University of Malaya. The participants were from the department of Software Engineering, Information Systems, Computer systems and Technology and Artificial Intelligence.

5.4.3 Description of activities

The objectives of the event were to present the process of design thinking and game-based learning, to identify the appropriate equipment for the ICT-INOV design thinking lab, and to discuss the learning approach for using design thinking in real-life courses.

The event started with the presentation by Dr. Raja Jamilah Raja Yusof on ICT-INOV grant objectives and expectations. The researchers were briefed on what is expected of their role in the Erasmus grant which involved the usage of design thinking and gamification in the classes conducted by the lecturers.

Next, Assoc. Prof. Dr Aishah Abu Bakar gave a presentation on design thinking and game-based learning. Her presentation was very interesting and motivating. It explained the importance of understanding design thinking for the future generation to equip them with relevant knowledge to address the current challenges.

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Furthermore, Dr. Raja Jamilah presented to the audience the potential equipment to be used in the project. At the same time, Dr. Raja Jamilah provided the audience with the opportunity to suggest other equipment that could be usable in the teaching lab.

Lastly, Dr Rodina shared some information about the possibility of publication from the ICT-INOV research grants. She shared several useful research papers that can be used as guidance for replicating the research.

The workshop continued the next day, with the engagement of the audience in design thinking and gamification activities. The information about the workshop was distributed among group members through email and shared google documents.

The following material was used in the event:

Event presentation:

<https://docs.google.com/presentation/d/1GJtZ9uTD5rw-2Z0qaDRr19qB3xOvqq7-o8TWe3KsOYg/edit?usp=sharing>

Design thinking principles:

https://drive.google.com/file/d/1pZ4cyb_UvKDfROCwBvw0W4xcHLu4fMcR/view?usp=sharing

5.4.4 Feedback and dissemination

The workshop was very well accepted by participants, who had the opportunity to discuss the possibilities and benefits offered by the ICT-INOV implementation at the University of Malaya.

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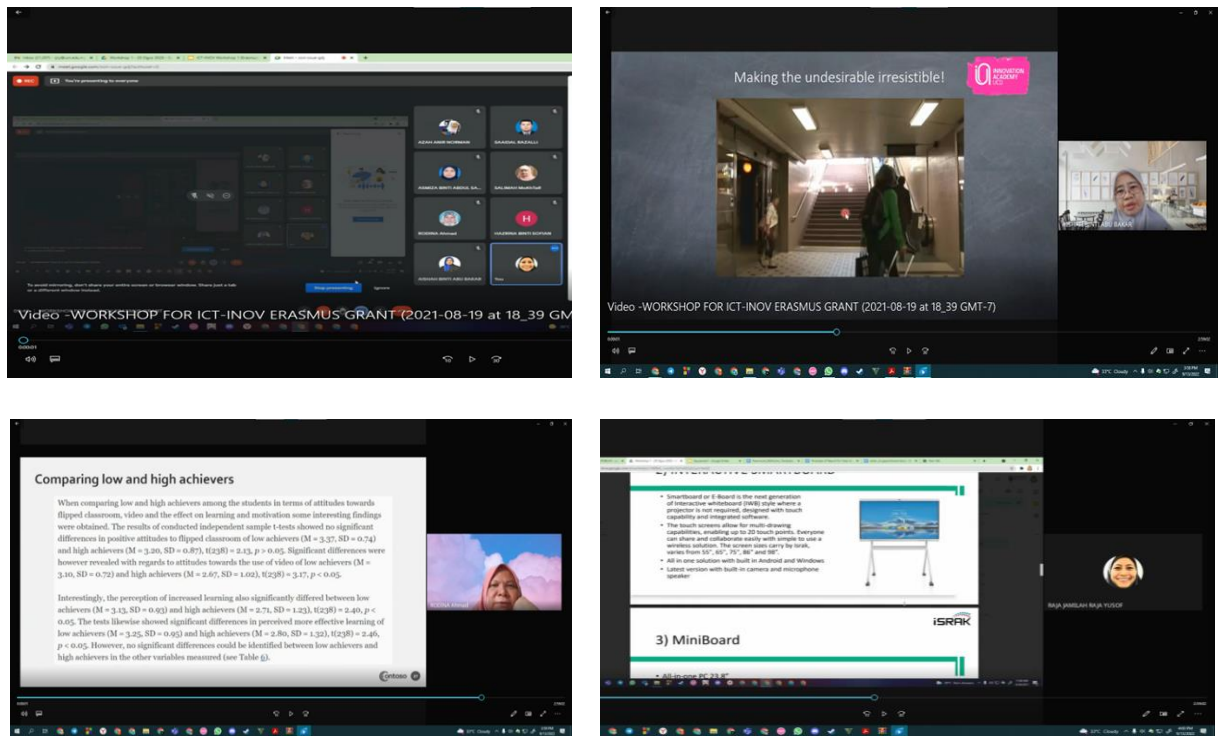


Figure 20. 4th instructor training event at the University of Malaya, August 30 – September 1, 2021.

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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 being enforced in Malaysia.

6.1.2 Participants

The event was attended by 50 lecturers from the 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 the design thinking approach, emphasising the first 3 stages. The workshop aimed to transfer knowledge on design thinking to the participants and 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 practising 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 the project manager at University Tenaga Nasional, Assoc presented. Prof. Ts. Dr. Hazleen Aris. During the workshop, participants were introduced to the design thinking approach and practical examples on how it can be used to improve and enrich the teaching and

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learning experience while 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 of the effectiveness of this approach in fostering innovative graduates.

6.1.4 Feedback and dissemination

All participants developed valuable skills in design thinking from Prof. Sofri for higher education. 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 21. 1st instructor training event at University Tenaga Nasional on June 30, 2021.

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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 of 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 30 lecturers from the 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 a 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 of the application of design thinking in higher education. The content of this workshop included an empathy map that helps understand stakeholder needs, a user journey map, a 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 from the trainer. Subsequent workshops will focus on the instructors who are seriously considering applying design thinking in their courses, and the ICT-INOV platform will also be introduced for hands-on training.

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6.2.4 Feedback and dissemination

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 22. 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 being 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

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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, Engineering and Business Management and Accounting at University Tenaga Nasional. Participants were potential pilot instructors who will be implementing a 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 in implementing 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 of the design thinking phases in the morning session. Afterwards, 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 online 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 with the ICT-INOV digital services. The one-day session ended with the

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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 dissemination

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.](https://www.linkedin.com/posts/hazleen-aris_agility-covidehi19-designthinking-activity-6907997598670569473-?utm_source=linkedin_share&utm_medium=member_desktop_web)



Figure 23. 3rd instructor training event at University Tenaga Nasional on March 11, 2022.

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6.4 4th instructor training event at University Tenaga Nasional on July 22, 2022

6.4.1 Location, context, time, and duration

Following the 3 instructor training conducted earlier, the 4th instructor training Instructor Refresher Hi-Tea was organized as a continuation for the pilot instructors who agreed to be on board for this project. The session was dedicated to sharing experiences and hands-on guidelines of design thinking concepts and the usage of the ICT-INOV platform. The session took place in UNITEN Design Thinking Lab, on level 5, Information Resource Centre.

6.4.2 Participants

The session was attended by 10 lecturers from University Tenaga Nasional who would be implementing design thinking in their ICT courses in the upcoming semester in September.

6.4.3 Description of activities

The event was a half-day sharing session where each instructor explained about which course and what topic in each of the instructor's course outlines will apply the design thinking approach. Project manager, Assoc. Prof. Ts. Dr. Hazleen Aris also introduced the ICT-INOV platform during the session. They coached the pilot instructors on using the platform throughout their implementation of the design thinking approach next semester.

6.4.4 Feedback and dissemination

All pilot instructors' participants provided positive comments on the existing ICT-INOV platform. By using the platform, instructors were able to share various design thinking innovations with each other in their ICT course. The instructors also showed enthusiasm for sharing their own design thinking activities on the platform shortly.

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4th instructor training event at University Tenaga Nasional on July 22, 2022.

6.5 5th instructor training event at University Tenaga Nasional on August 22, 2022

6.5.1 Location, context, time, and duration

Exactly a month after the Hi Tea, the Instructor Preparatory Workshop was conducted. The workshop was conducted in the Administration Building because the Design Thinking Lab was occupied. The half-day program was dedicated to sharing plans for implementing design thinking concepts for the semester 1 syllabus.

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6.5.2 Participants

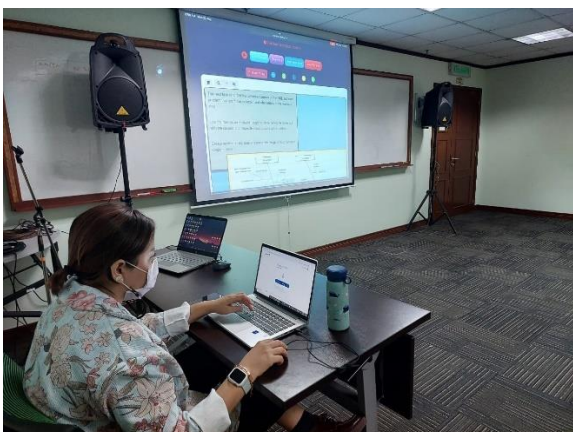
The session was attended by 6 lecturers from Universiti Tenaga Nasional who would implement design thinking in their ICT courses in the upcoming semester in September 2022.

6.5.3 Description of activities

The event was a half-day sharing session where each instructor explained a specific topic and some activities recommended for use. Each instructor also shared how the marking rubrics will reflect the implementation of design thinking in their courses.

6.5.4 Feedback and dissemination

All pilot instructors shared their plans on how to execute design thinking approaches in their teaching. They also highlighted some improvements to be made based on their initial trial in the recent semester. The instructors also showed enthusiasm for the ideas of how design thinking activities can improve students' innovativeness in the next semester.



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Figure 24. 5th instructor training event at University Tenaga Nasional on August 22, 2022.

6.6 6th instructor training event at University Tenaga Nasional on April 12, 2023

6.6.1 Location, context, time, and duration

Sketchpad tablet is one tool that allows students to quickly draw and upload sketches of their ideas in digital form. Sketchpad is useful for teaching and learning approaches such as design thinking, where ideation is one of the stages. Thus, UNITEN organized the 6th instructor training program titled “Ideate, Draw, Share! Sketchpad for Collaborative Design Thinking”. The training was conducted on April 12th, 2023, from 9.00 am to 12.00 pm at the Design Thinking Lab, Advanced Learning, Information Resource Centre, UNITEN.

6.6.2 Participants

The session was attended by 5 UNITEN course instructors. UNITEN planned to conduct the same training for students shortly.

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6.6.3 Description of activities

The half-day event consisted of instructors being introduced to the sketchpad tool and practice on how to draw. The activities helped instructors to make ideation activities more interesting.

6.6.4 Feedback and dissemination

Instructors shared their experiences and feedback using the Sketchpad tools. The tools were friendly to non-IT savvy people and could enhance the ideation stage of design thinking.



Figure 25. 6th instructor training event at University Tenaga Nasional on April 12, 2023.

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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 School of Computing lecture halls.

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 were 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, worked on a team canvas outlining collaboration rules and engaged in creative exercises. In the problem definition phase, they defined the problem space. In the discovery phase, they used activities such as a neighbourhood walk, which provides diverse viewpoints on a problem. They further prepared and conducted interviews to understand user

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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's pain and gain. In the ideation phase, they engaged in association-building exercises and activities that helped 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, post instructions for students for each design thinking step, the platform analytics, the gamification elements that promote engagement through rewards, 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 for a class, join a team, and participate in design thinking by sharing ideas in 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 centres.

7.1.4 Feedback and dissemination

It was promoted via email to students and faculty members across departments. Overall, it was a very productive activity that achieved its goal of promoting the update of project outcomes. The

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feedback from the participants was very positive, particularly with respect to the proposed design thinking methodology and supporting digital learning services.



HUMANITARIANS

<p>INTRODUCTION TO THE TOPIC</p> <p>A large population of Pakistan is homeless and are denied of basic necessities of life such as safety of a home, food, education etc. These poverty-stricken people resort to begging and often crimes. A proper initiative must be taken to help such people.</p>	<p>OBJECTIVES</p> <p>We want to reduce homelessness and give them access to a safe and secure life</p> <p>TARGET GROUPS</p> <p>Target audience of our project are individuals who are on the verge of homelessness or who are living in slum areas due to being unemployed because of pandemic such as factory workers, domestic helpers etc.</p>
<p>ICT IN PROJECT</p> <p>Our application would be an easy access platform where individuals can donate to this project from the comfort of their homes.</p>	<p>MARKETING IMPLEMENTATION POTENTIAL</p> <p>Our application is not intended to be commercialized since we are a non-profit organisation that relies heavily on donations to aid the impoverished.</p>
<p>TEAM</p> <p>Amna Shehzad 211-1209 Malika Zafar 211-1110 Fatima Bilal 211-1191 Maham Munir Kisa Fatima 211-1138</p>	<p>SOLUTION</p> <ul style="list-style-type: none"> Holding meetings and spreading social media awareness in order to secure funds for our project. Using the fund we plan to organize training camps for these people so that they can acquire certain skill set that will make it easier for them to be employed. These people then can rent places for themselves to live or at least will prevent them from being homeless.

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

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7.2 2nd instructor training event at the Software Engineering and Automation lab (SEAL) National University of Computer and Emerging Sciences on December 22, 2022

7.2.1 Location, context, time, and duration

An instructor training event took place at the Software Engineering and Automation Lab, Department of Software Engineering of the National University of Computer and Emerging Sciences, on December 22, 2022.

7.2.2 Participants

The event was attended by 10 higher education instructors from the Department of Computer Science and Software Engineering of the National University Computer and Emerging Sciences.

7.2.3 Description of activities

Participants were 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.

Additionally, participants saw illustrations of exercises that may be used in the stages of the design thinking process that involve creating a team, encouraging creativity, identifying problems, empathetic problem-solving, redefining problems, ideation, idea selection, prototyping, and evaluation. At every stage of the design thinking process, they employed tools. During the team building phase, for instance, participants worked on a team canvas detailing collaboration guidelines, created team logs, presented their teams, and participated in creative exercises. They defined the problem space during the problem specification stage. They employed exercises like a neighbourhood walk, which offers a variety of perspectives on a particular issue, during the discovery stage. To understand consumer needs further, they prepared and conducted interviews. They created a user persona by mapping the results.

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At the end, the attendees were given a demonstration of the ICT-INOV learning platform. To be more precise, participants were shown the instructor and student interfaces. The participants saw how to make an activity, how to post instructions for students to follow each step in the design thinking process, how to access the reference manual, the calendar of activities, the platform analytics, and gamification elements that encourage engagement through rewards. Participants also observed the platform's resource library, which offers exercises that are recommended for every step of the design thinking process. Teachers can choose which exercises to incorporate into the activities they create for their students. Participants saw how students sign up for classes, form teams, and take part in design. 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.

7.2.4 Feedback and dissemination

The event 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 positive, and they found it interesting to identify problems and solutions using design thinking.

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Figure 27. 2nd instructor training event at the National University of Computer and Emerging Sciences on December 22, 2022.

7.3 3rd instructor training event was conducted at the Software Engineering and Automation lab (SEAL) National University of Computer and Emerging Sciences on December 28, 2022

7.3.1 Location, context, time, and duration

An instructor training event took place at the Software Engineering and Automation Lab, Department of Software Engineering of the National University of Computer and Emerging Sciences, on December 28, 2022.

7.3.2 Participants

The event was attended by 18 higher education instructors from the Department of Computer Science and Software Engineering of the National University of Computer and Emerging Sciences.

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7.3.3 Description of activities

Participants were introduced to design thinking and gamification ideas, which form the foundation of the proposed ICT-INOV methodological learning approach for building innovation abilities in higher education.

Participants were shown examples of exercises that can be used in the stages of the design thinking process, such as team building, creativity encouragement, problem identification, empathetic problem-solving, problem redefining, ideation, idea selection, prototyping, and evaluation. They used tools and exercises throughout the design thinking process. During the team building phase, for example, participants worked on a team canvas outlining collaboration standards, made team logs, presented their teams, and engaged in creative activities. They defined the problem space during the problem specification phase. During the exploration stage, they used exercises such as a neighbourhood stroll to get different viewpoints on a certain issue. They planned and conducted interviews to have a better understanding of consumer demands.

Participants generated a user persona by mapping the results. Finally, the attendees were shown a demonstration of the ICT-INOV learning platform. To be more specific, participants were shown the instructor and student interfaces. The participants learned how to create an activity, provide instructions for students to follow each phase of the design thinking process, access the reference manual, the activity calendar, platform analytics, and gamification components that drive engagement through prizes. The participants also looked at the platform's resource library, which includes exercises intended for each stage of the design thinking process. Teachers can choose which exercises to include in the activities they design for their pupils. Participants observed how students register for classes, join groups, and participate in design. They were also exposed to genuine ICT-INOV learning activities created for the Software Engineering and Technologies in

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Education courses. These activities have already been implemented in classes. Participants had the opportunity to view examples of good practice on the student canvas.

7.3.4 Feedback and dissemination

It was promoted via email to the faculty members across departments. The participants enjoyed the opportunity to learn about design thinking.



Figure 28. 3rd instructor training event at the National University of Computer and Emerging Sciences on December 28, 2022.

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7.4 4th instructor training event was conducted at the Software Engineering and Automation lab (SEAL) National University of Computer and Emerging Sciences on October 19, 2023

7.4.1 Location, context, time, and duration

An online instructor training event took place at the Software Engineering and Automation Lab, Department of Software Engineering of the National University of Computer and Emerging Sciences on October 19, 2023

7.4.2 Participants

The event was attended by 27 higher education instructors from the Department of Computer Science and Software Engineering of the National University Computer and Emerging Sciences.

7.4.3 Description of activities

Participants were introduced to design thinking and gamification ideas, which form the foundation of the proposed ICT-INOV methodological learning approach for building innovation abilities in higher education.

Participants were also given examples of exercises that could be used in the stages of the design thinking process, such as team formation, creativity encouragement, problem identification, empathetic problem-solving, problem redefining, ideation, idea selection, prototyping, and evaluation. They used tools at every level of the design thinking process. During the team building phase, for example, participants worked on a team canvas outlining collaboration standards, wrote team logs, presented their teams, and took part in creative activities. They specified the problem space at the problem specification stage. During the exploration stage, they used exercises such as a neighbourhood stroll to get diverse opinions on a certain subject. They prepared and conducted further interviews to better understand consumer wants. They developed a user persona by mapping the results.

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Finally, the ICT-INOV learning platform was demonstrated to the attendees. Specifically, participants were shown the instructor and student interfaces. Participants learned how to create an activity, post instructions for students to follow each step in the design thinking process, and access the reference manual, activity calendar, platform analytics, and gamification components that encourage participation through prizes. Participants also looked at the platform's resource library, which has exercises for each design thinking stage. Teachers can select which exercises to include in the activities they design for their pupils. Participants witnessed how students sign up for classes, establish groups, and participate in design. They were also exposed to genuine ICT-INOV learning activities created for the Software Engineering and Technologies in Education courses. These activities have already been used in classes. Participants were able to observe students canvassing examples of good practice.

7.4.4 Feedback and dissemination

It was promoted via email to the faculty members across departments. The participants enjoyed the opportunity to learn about design thinking.

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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 to familiarize 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 could 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.

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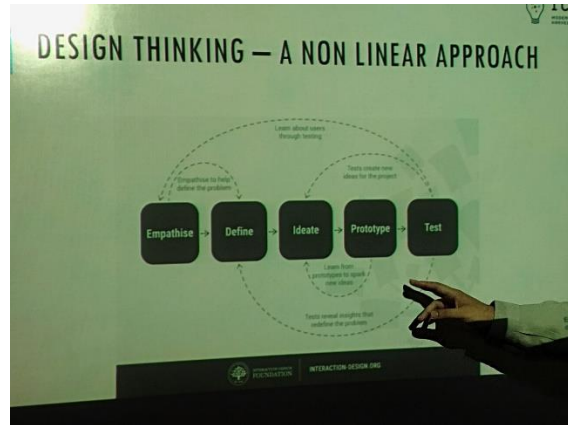


Figure 29. 1st instructor training event at ISRA University, October 21, 2022.

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8.2 2nd instructor training event, ISRA University, January 27, 2023

8.2.1 Location, context, time, and duration

The 2nd instructor training event at ISRA University was organized at the Department of Computer Science on January 27, 2023. The workshop was organized in one of the general-purpose labs of the engineering, sciences, and technology faculty, Isra University, Hyderabad. All the faculty members of the faculty of engineering, sciences, and technology, as well as the faculty of business, education, social science, and humanities, were invited to attend the workshop.

8.2.2 Participants

A total of 10 faculty members from all the departments of faculty of engineering, sciences, and technology, as well as faculty of business, education, social science, and humanities, attended the event.

8.2.3 Description of activities

The workshop was organised for the faculty members to introduce the design thinking process and its use in the classroom environment. The faculty members were exposed to the steps involved in design thinking-related activities. They first demonstrated how the design thinking steps and activities related to it can be used in the classroom. Later, they were given a demonstration of the design thinking platform developed as a part of the project. Then, they were asked to use the platform and create activities related to the courses they were teaching for practice.

8.2.4 Dissemination and feedback

The event was promoted through social media. Feedback was very positive, with participants committed to use the new knowledge in courses.

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Figure 30. 2nd instructor training event at ISRA University, January 27, 2023.

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8.3 3rd instructor training event, ISRA University, August 7, 2023

8.3.1 Location, context, time, and duration

The 3rd instructor training event at ISRA University was organized at the Department of Computer Science, Isra University, on August 7, 2023. The workshop was organized in one of the general-purpose labs of the faculty of engineering, sciences, and technology, Isra University, Hyderabad. All the faculty members and students of the Department of Computer Science were invited to attend the workshop.

8.3.2 Participants

A total of 35 faculty members, staff, and students of the Department of Computer Science attended the event.

8.3.3 Description of activities

Several pieces of equipment were purchased to create the ICTINOV lab. One of the equipment purchased was a Prusa i3 MK3S+ Kit 3D printer. The workshop was organised for the faculty members and students to introduce the 3D printer and give a hands-on approach to using 3D printers for their projects. The trainer step-by-step demonstrated to the faculty and students how to assemble, install, configure, and use a 3D printer and print objects. Later, students had an opportunity to have an experience with the printed object and 3D printer to print different objects.

8.3.4 Dissemination and feedback

The event was promoted through social media. Feedback was very positive, with participants committed to using the new knowledge in courses.

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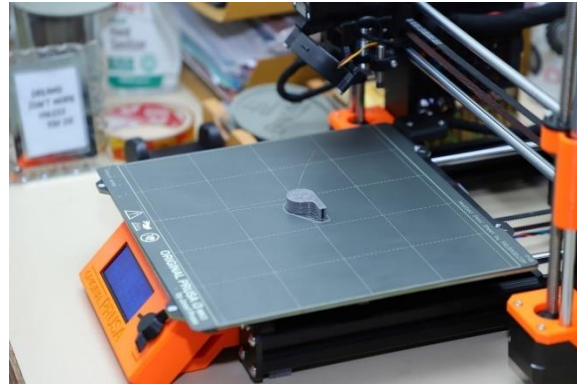


Figure 31. 3rd instructor training event at ISRA University, August 7, 2023.

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8.4 4th instructor training event, ISRA University, November 20, 2023

8.4.1 Location, context, time, and duration

The 4th instructor training event at ISRA University was organized at the Department of Computer Science, Isra University, on November 20, 2023. The workshop was organized in one of the general-purpose labs of the engineering, sciences, and technology faculty, Isra University, Hyderabad. All the faculty members and senior students of the Department of Computer Science were invited to attend the workshop.

8.4.2 Participants

A total of 11 faculty members and staff of the Department of Computer Science attended the event.

8.4.3 Description of activities

The event focused on building familiarity with Arduino[®] and Raspberry Pi[®] equipment purchased through ICT-INOV. The workshop's purpose was to provide faculty members with hands-on experience with the equipment so that they could integrate it into courses. The participants were divided into different groups, and each group was given a set of tasks to complete one at a time. The participants had the opportunity to see how students can be engaged in different activities using the equipment in their courses.

8.4.4 Feedback and dissemination

The event was promoted through social media. Feedback was very positive, with participants committed to using the new knowledge in courses.

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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 at Kathmandu University took place at the Department of Computer Science and Engineering of Kathmandu University, Dhulikhel, on June 6, 2022. The event lasted 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 into 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 in the project to facilitate design thinking in the classroom.

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

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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 to incorporate 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 innovation skills development. The event was disseminated on the Kathmandu University portal at [Kathmandu University \(ku.edu.np\)](http://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.

9.2 2nd instructor training at Kathmandu University, February 6, 2024

9.2.1 Location, context, time, and duration

The 2nd instructor training took place at the Active Learning Lab, Department of Computer Science and Engineering, on 06 February 2024

9.2.2 Participants

The event was attended by 15 faculty members of the Schools of Science, Engineering, and Management of Kathmandu University.

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9.2.3 Description of activities

Kathmandu University Department of Computer Science and Engineering organized a half-day training session titled “Instructor Training on Design Thinking in Education” for training faculty members of the School of Engineering on February 6, 2024, in the university’s Active Learning Lab that has been developed through project ICT-INOV.

The event started with a welcome speech from Prof. Dr Sudan Jha, who welcomed participants, emphasizing the importance and need of related events. The session familiarized the participants with the concept and implementation of design thinking in education. Prof. Dr Manish Pokharel, Principal Investigator of the ICT -INOV project at Kathmandu University, shared his ideas on adapting recent emerging technology and design thinking in teaching and learning practices with the concepts of rapid learning, unlearning, and relearning.

Dr. Hariklia Tsalapatas from the University of Thessaly, Greece, Coordinator of the ICT-INOV project, shared her experience of implementation of design thinking in different academic courses at the University of Thessaly and other academic institutions of Greece.

Asst. Prof. Dhiraj Shrestha of Kathmandu University facilitated the event with a hands-on session on the project's design thinking platform.

9.2.4 Feedback and dissemination

The event was very positively received by the audience, that appreciated the benefits of design thinking as a learning methodology for innovation. It was disseminated through Kathmandu University’s social media pages at <https://www.facebook.com/docse.ku/posts/348368338111048>.

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9.3 3rd instructor training event at Kathmandu University, February 7, 2024

9.3.1 Location, context, time, and duration

The 3rd instructor training at Kathmandu University took place at the Active Learning Lab, Department of Computer Science and Engineering, on February 7, 2024.

9.3.2 Participants

The event was attended by 14 faculty members from different departments of the Schools of Science and Engineering of Kathmandu University.

9.3.3 Description of activities

Kathmandu University, Department of Computer Science and Engineering, organized a half-day training session titled “Instructor Training on Design Thinking in Education” for training faculty members of the School of Science on February 7, 2024, in the Active Learning Lab developed through project ICT-INOV. The event started with a welcome speech from Dr Bal Krishna Bal, Head of the Department of Computer Science and Engineering, who explained the importance and benefits of related events for capacity building. The keynote speaker, Prof. Dr Manish Pokharel, delivered a presentation on the importance of adaptability of technology and user-centric definition of problems in problem-solving techniques in the field of education.

Dr. Raja Jamilah Raja Yousuf from the University of Malaya and Dr. Hariklia Tsalapatras from the University of Thessaly presented their experiences in implementing design thinking in education at their university.

Asst. Prof. Dhiraj Shrestha and Dr Rajani Chulyadyo assisted the participants in hands-on sessions on the use of the ICT-INOV platform.

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Asst. Prof. Sameer Tamrakar facilitated the event with MC responsibilities during the talks and discussion sessions.

9.3.4 Feedback and dissemination

The event was very positively received by the audience, that appreciated the international dimension of the activities and presentations from ICT-INOV team members. It was disseminated through Kathmandu University's social media pages at <https://www.facebook.com/docse.ku/posts/349051158042766>.



Figure 32. 3rd instructor training event at Kathmandu University, February 7, 2024.

9.4 4th instructor training event at Kathmandu University, February 15, 2024

9.4.1 Location, context, time, and duration

The 4th instructor training at Kathmandu University took place at Nepathya College, Manigram, Rupandehi on 15 February 2024.

9.4.2 Participants

The event was attended by 17 faculty members from different departments of Nepathya College.

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9.4.3 Description of activities

Kathmandu University, Department of Computer Science and Engineering, organized a half-day training session titled “Instructor Training on Design Thinking in ICT Education” for training faculty members of Nepathya College on February 15, 2024 in Nepathya College.

Asst. Prof. Dhiraj Shrestha was an instructor at the event. The training started with a brief description of the objectives and activities of the ICT-INOV project. Dr Shrestha described the importance of design thinking in today's ICT Education and shared his experience incorporating design thinking at Kathmandu University.

Mr. Shrestha assisted the participants in hands-on sessions on the ICT-INOV platform.

9.4.4 Feedback and dissemination

The event was disseminated through Kathmandu University’s social media pages at <https://www.facebook.com/nepathyacollege/posts/799833028825627>.

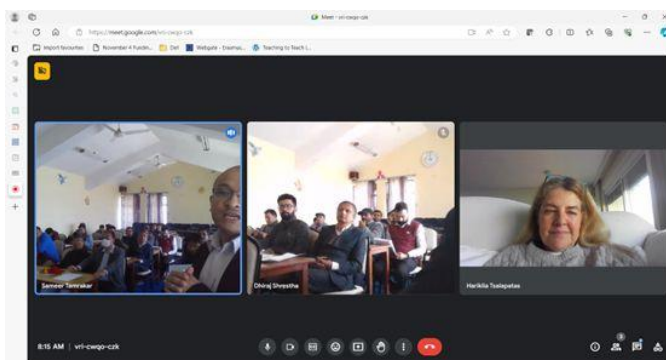


Figure 33. 4th instructor training event at Kathmandu University, February 15, 2024.

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9.5 5th instructor training event at Kathmandu University, February 23, 2024

9.5.1 Location, context, time, and duration

The 5th instructor training organized by Kathmandu University took place at the Institute of Engineering, Pashchimanchal Campus, Lamachaur Pokhara, on 23 February 2024.

9.5.2 Participants

The event was attended by 25 faculty members from different colleges in Pokhara Valley.

9.5.3 Description of activities

Keynote Speaker Dr Manish Pokharel, Principal Investigator of the ICT-INOV project at Kathmandu University and Dean School of Engineering, presented his talk on “Design Thinking with Generative AI for Education 4.0” where he shed light on the needs of modern education and how emerging technology and AI can be a boon for teaching and learning processes.

Dr. Hariklia Tsalapata of the University of Thessaly and coordinator of the ICT-INOV project presented her experience sharing design thinking implementation for education in Greece.

Asst. Prof. Dhiraj Shrestha and Sameer Tamrakar facilitated a hands-on session and demonstrated the ICT-INOV platform for design thinking in education.

The event concluded with Token of Love's distribution and closing remarks from Dr. Harisharan Adhikari, Deputy Campus Chief and Er. Khem Raj Koirala, HoD Electronics & Computer Engineering. Dr. Adhikari highlighted the importance of related events for faculty members and the need for further collaboration among academic institutions.

Er. Khem Raj Koirala, Head of the Department of Electronics and Computer Engineering, coordinated the event. Mr. Nabin Lamichhane, Deputy Head of the Department of Electronics and Computer Engineering, facilitated the event with MC responsibility.

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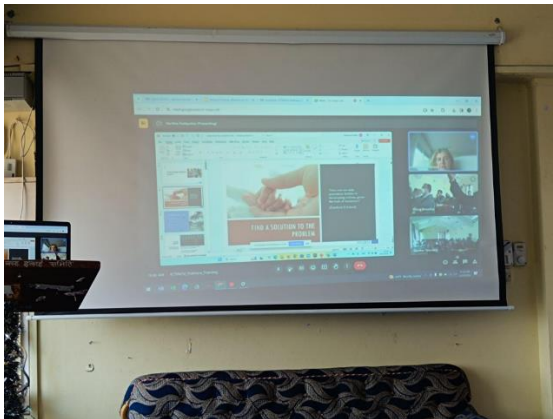
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9.5.4 Feedback and dissemination.

The event helped reach educators in the Pokhara Valley, who appreciated the opportunity to engage in innovation building activities with wide applicability in the classroom.



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Figure 34. 5th instructor training event organized by Kathmandu University at Pashchimanchal Campus, February 23, 2024.

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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 occurred at the Design Thinking Lab developed through project ICT-INOV at 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 Center for Energy Studies director, 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 lab. He also gave an overview of design thinking, the lab's purpose, and the project's objectives.

The trainers of the equipment provider conducted a technical session with 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

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participants to use each of the features, answering questions in the meantime. Second, they demonstrated more advanced system features, 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 with each other during lunch.

10.1.4 Feedback and dissemination

The feedback from the participants was very positive. They demonstrated an 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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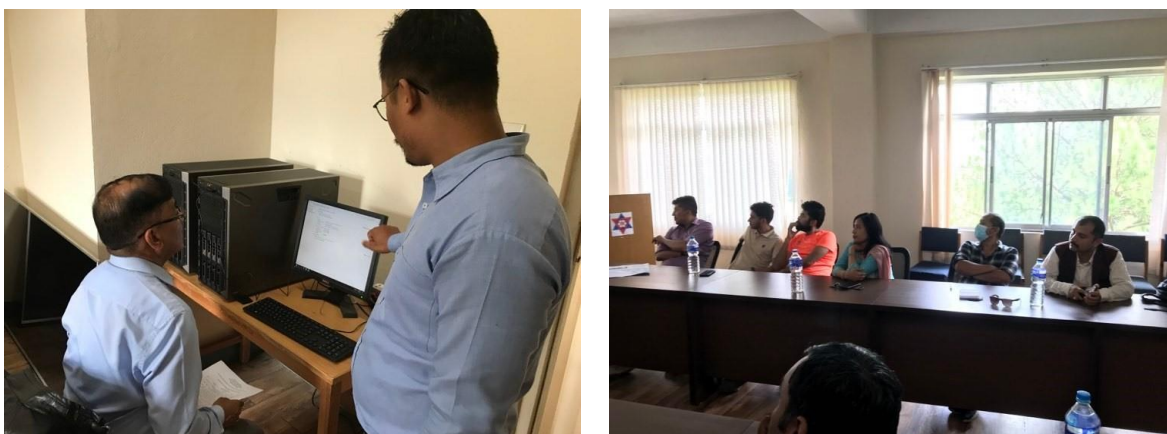


Figure 35. 1st instructor training event at Tribhuvan University’s Center for Energy Studies, July 5, 2021.

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.

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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 Center for Energy Studies Director, 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 online. He further discussed how the ICT-INOV digital learning platform can be integrated into curricula courses. The demo was followed by a hands-on trial in which participants used digital tools.

10.2.4 Feedback and dissemination

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

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Figure 36. 2nd instructor training event at Tribhuvan University’s Center for Energy Studies, July 27, 2022.

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10.3 3rd instructor training event at Tribhuvan University, June 4, 2023

10.3.1 Date and location

Tribhuvan University organized a 3rd instructor training event on June 4, and 23 at the Design Thinking Lab at the Center of Energy Studies (CES), Institute of Engineering, Tribhuvan University. The event's purpose was to train instructors on using the lab equipment and gather feedback on the lab's usability.

10.3.2 Participants

The event was attended by 19 faculty members, instructors, research assistants, and staff, including individuals who had participated in earlier ICT-INOV training events and new participants.

10.3.3 Description of activities

The program began with a warm welcome from Prof. Dr. Tri Ratna Bajracharya, the Center of Energy Studies Director. Following the welcome, each participant had the opportunity to introduce themselves briefly. The Director then provided an overview of the ICT-INOV project, highlighting the accomplishments thus far. He discussed the variety and quantity of equipment acquired through the project and the lab's available facilities. Additionally, he comprehensively explained design thinking, the lab's purpose, and the project's objectives.

Trainers from the equipment vendor company conducted the main technical session. They began by demonstrating the fundamental features and functions of communication devices and robotics development kits. As they guided the participants through each feature, they also trained them to address any queries that arose. Subsequently, they proceeded to showcase more advanced system features, including videoconferencing, remote access, app installation, and voting.

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10.3.4 Feedback and dissemination

The session included a detailed question-and-answer period, during which the trainers responded to inquiries from the participants. Additionally, this provided an opportunity for the trainers to gather feedback, which was very positive. Finally, the training concluded with interactive discussions among the participants.



Figure 37. 3rd instructor training at Tribhuvan University, June 4, 2023.

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11. Hanoi University

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

11.1.1 Location, context, time, and duration

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.

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, practising creating and deploying activities on the platform.

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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.

11.1.4 Feedback and dissemination

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 38. 1st instructor training event at Hanoi University, May 27, 2022.

11.2 2nd instructor training event at Hanoi University on December 12, 2022

11.2.1 Location, context, time, and duration

The 2nd instructor training event at Hanoi University took place at the Faculty of Information Technology on December 12, 2022.

11.2.2 Participants

The event was attended by 14 lecturers from the Faculty of Information and Technology, Hanoi University, 1 from the Faculty of Management and Tourism, Hanoi University, and 1 from FPT Greenwich University.

11.2.3 Description of activities

The event was delivered 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 targeted educators both from Hanoi University and external faculties. Activities started with a detailed introduction of design thinking and the methodology's steps. The presentation was delivered by Dr. Nguyen Xuan Thang, Dean of Faculty of Information Technology and ICT-INOV

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project manager at Hanoi University. The presenter provided some examples of design thinking activities that can be deployed in class. More specifically, the audience had the chance to experience the design thinking platform and created design thinking activities themselves for their own class. While the audience was using the platform, the trainers provided support where needed and answered questions.

11.2.4 Feedback and dissemination

The event was very positively received by the audience, that particularly appreciated the benefits offered by the ICT-INOV digital learning platform towards collaborative learning design.



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Figure 39. 2nd instructor training event at Hanoi University, December 12, 2022.

11.3 3rd instructor training event at Hanoi University, June 24, 2023

11.3.1 Location, context, time, and duration

The 3rd instructor training event at Hanoi University took place at the Faculty of Information Technology on June 24, 2023.

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11.3.2 Participants

The event was attended by 19 lecturers from the Faculty of Information and Technology, Hanoi University, 1 from the IT department of IPComs corporation, and 2 from the Faculty of Management and Tourism, Hanoi University.

11.3.3 Description of activities

The event was delivered 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. Activities started with a brief introduction of the project and an overview of design thinking given by Dr. Nguyen Xuan Thang, Dean of the Faculty of Information Technology, Project Management at Hanoi University. Subsequently, the Dean presented some activities he used for his class last semester. In the second part of the instructor training, Ms Nguyet shared her experience with practising design thinking in the Information System and Design course, demonstrated some activities her class created on the platform, and how she used the platform to enhance student collaboration. Finally, the trainers gave some activities to discuss with the audience, and the training ended with QA activities.

11.3.4 Feedback and dissemination

The audience was actively engaged throughout the session, demonstrating direct interest in design thinking principles and their practical use in the classroom through the support of ICT-INOV digital infrastructures and digital learning services.

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Figure 40. 3rd instructor training event at Hanoi University, June 24, 2023.

11.4 4th instructor training event at Hanoi University, October 3, 2024.

11.4.1 Date, time, location, and context

The 4th instructor training event hosted by Hanoi University took place at the IT department of the company IpComs on October 3, 2023.

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11.4.2. Audience

The audience consisted of 1 lecturer from the Faculty of Information and Technology, Hanoi University, 4 trainers from the IT department of IPComs, and 7 internship students and junior developers of the IT department of IpComs.

11.4.3 Description of activities

The event trainers were Dr Tuan Vu Minh, Vice Dean of the Faculty, the key staff member of the project at Hanoi University, and Ms Nguyet Dinh Thi Minh, the project's key staff.

IpComs is a technology company that has been active in Vietnam for more than 20 years. This company provides information systems solutions and infrastructure to organizations. In October, Hanoi University worked with IpComs to organize training for trainers and new employees of the company on design thinking.

During the first session of the training, Dr Vu Minh Tuan gave a detailed introduction to the project and the project community. Subsequently, he presented activities that have been completed by the project as well as recent achievements.

In the second part of the instructor training, the presenter introduced design thinking to the audience and shared his experience in designing activities for his course. The training session ended with a demonstration of how to use the design thinking platform.

11.4.4 Feedback and dissemination

Students and educators appreciated the opportunity to engage in innovation building activities. They further appreciated the benefits of design thinking towards synthesizing solutions to complex modern challenges.

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Figure 41. 4th instructor training event at company IpComs, October 3, 2024.

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12. Von Neumann Institute

12.1 1st and 2nd instructor training events at Sai Gon University, July 4 - 5 and 11 – 12, 2022

12.1.1 Location, context, time, and duration

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 centre and easily accessible by educators from different institutions.

12.1.2 Participants

Over 50 instructors attended each of the 2 events. They are 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 desired to become familiar with the ICT-INOV learning methodology to improve their teaching skills and methods.

12.1.3 Description of activities

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

On the 2nd day, participants practised 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 students.

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

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

12.1.4 Feedback and dissemination

Participants were actively engaged throughout the training session, demonstrating high interest in the delivered presentations and workshops.

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D3.4 Report on instructor training at partner sites



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Figure 42. 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 one.

12.2 3rd instructor training event at the University of Banking September 7, 2022

12.2.1 Location, context, time, and duration

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

12.2.2 Participants

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

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12.2.3 Description of activities

The event had 2 main parts. In the 1st part of the event, the audience was familiarized on a high level with overall design thinking processes and techniques. Participants discussed 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 practised 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 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 to become familiar with each other and break 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, under the supervision of the Von Neumann Institute's presenter, participants discussed how to tailor the process to adapt it to different contexts in classes and subjects.

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

12.2.4 Feedback and dissemination

Participants delivered positive feedback to the activities, highlighting the direct applications of proposed innovation-building practices in educational contexts.

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Figure 43. 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 partner 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 ongoing process that will span the second half of the project implementation period to promote 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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