ICT-INOV
MODERNIZING ICT EDUCATION FOR HARVESTING INNOVATION

DESIGN THINKING EXPERIENCES IN GREECE

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DESIGNING THE FIRST CAR

Ford asked people what they need

the response was a faster horse

when they actually needed was a car

FIND A SOLUTION TO THE PROBLEM

"How can we help premature babies in developing nations, given the lack of incubators"

(Stanford D.School)

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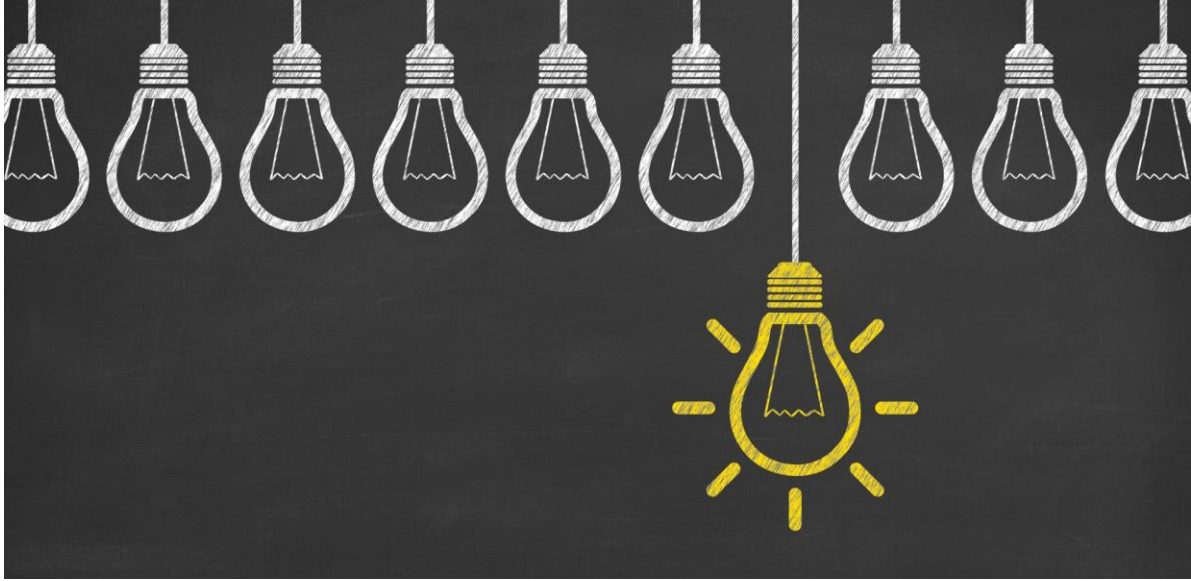
DESIGN THINKING

User centred design, going well beyond questionnaires



Designers strive to understand the **actual, real problem**

To see the world from the **user's standpoint**

To **design solutions** from the **user perspective**

To consider **needs, desires, and feelings**

Even when **users cannot describe the needs** themselves

DESIGN AND INNOVATION

In the future, all problems will be design problems (Tim Brown, Change by Design)

- Education
- Health
- Poverty
- Energy
- Sustainability
- Natural resources management

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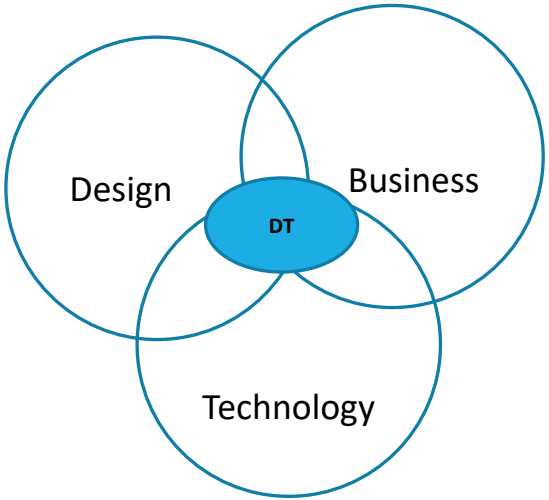

Design thinking is in the **intersection** of what is **feasible, desirable, technologically possible**

(Stanford D.school, IDEO)

THE IMPORTANCE OF TECHNOLOGY IN INNOVATION

UNDERSTANDING THE PROBLEM

Designers put themselves “in the users’ shoes”

They observe, empathize

They live in the user’s environment to experience needs first-hand

- E.g. To design solutions for a small village, the designers live in the village for a few days

This allows understanding **latent needs**

- That users may not be able to express (Tim Brown, Change by Design)
- It allows understanding of **functional** and **emotional** aspects

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UNDERSTANDING THE PROBLEM

Observe users in their everyday activities

Observe unusual, subconscious acts that demonstrate a need

- E.g. users use a book as doorstop (Tim Brown, Change by Design)
- Users label the cables under the table in different colors to easier identify them

- These show latent needs that users solve with simple hacks

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UNDERSTANDING THE PROBLEM

Observe a team of non-characteristic users

- E.g. To design kitchen utensils observe
- Children, who need ease of use
- Chefs, who need easy cleaning of utensils

- How can we get ideas for maximizing usability?

UNDERSTANDING THE PROBLEM

Observe different situations

- E.g. The pits for tire changing in formula 1, a team of specialists working in high precision conditions

- How can we get ideas for designing an emergency room?

THE VALUE OF DESIGN THINKING

By understanding the **real**, as opposed to perceived, needs

Designers can **solve difficult problems, even if a solution does not appear to exist at first sight**

- E.g. Consider the example of incubators

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WHO USES DESIGN THINKING

Entrepreneurship: For designing commercial products

Social entrepreneurship: For designing solutions to complex social challenges

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ENTREPRENEURSHIP: AIRBNB

AirBnb was not always successful

- Users did not rent the apartments

They used design thinking to upgrade services

They hypothesized that the problem was unclear pictures

The used a professional camera to capture clear pictures and improved the text

- A simple adjustment made all the difference

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SOCIAL ENTREPRENEURSHIP: MALNUTRITION

Malnutrition was widespread

Designers observed that some very poor families had well fed children

They observed everyday practices

Villages collected rice from the rice fields

- They also collected small organisms, such as shrimp, providing protein

Designers taught all parents this technique with excellent results

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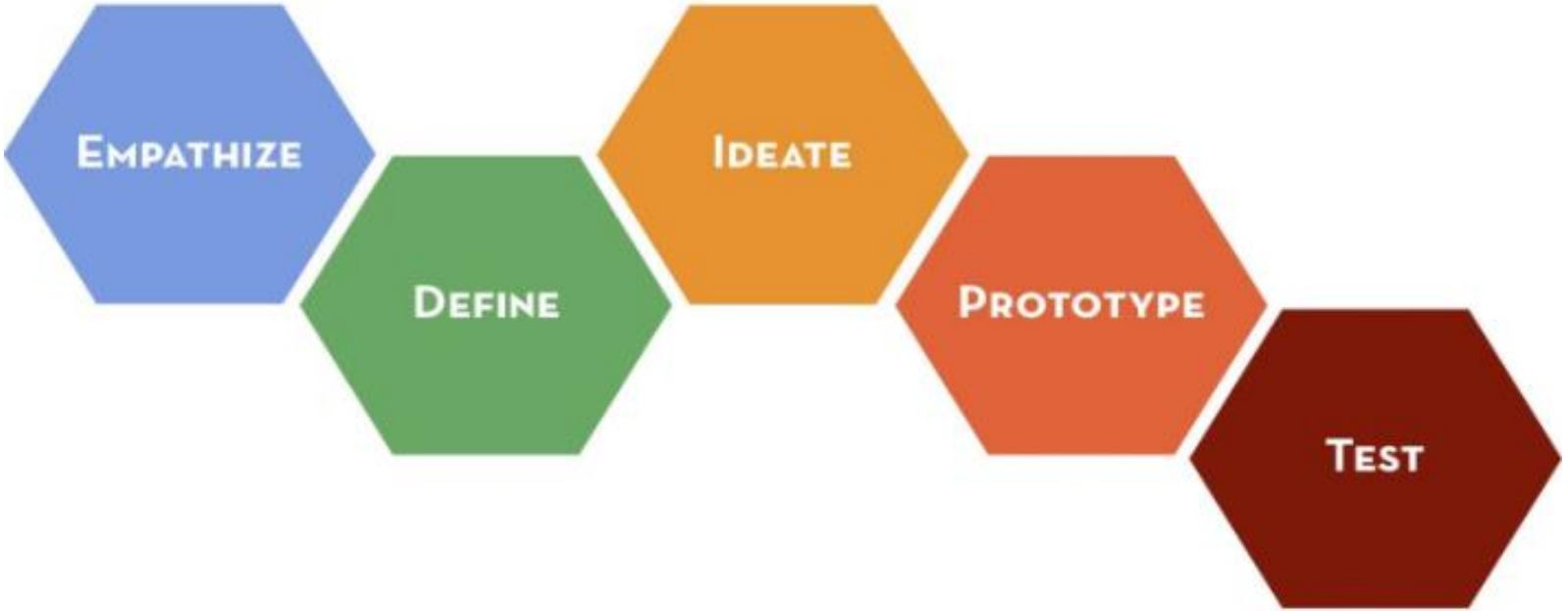
DESIGN THINKING MODEL

** STANFORD D.SCHOOL, IDEO

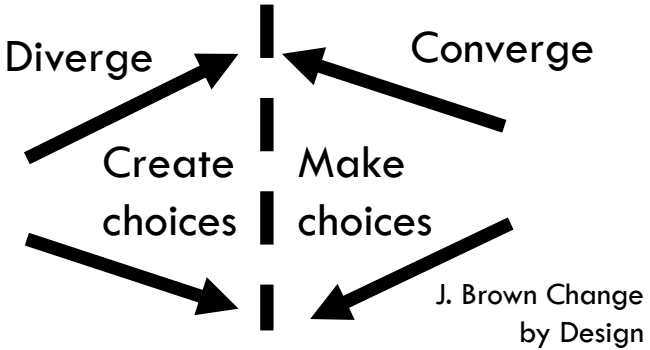


DIVERGE TO CONVERGE

New ideas on consumer behaviour

Alternative ideas for new products

Alternative ways for creating the user experience



J. Brown Change by Design

"To have a good idea, you need first to have a lot of ideas", L. Pauling

"Chance only favours the prepared mind" L. Pasteur

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DEPLOYMENT IN GREECE

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ICT-INOV
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THE GOAL OF ICT-INOV

Help Computer Science and Computer Engineering students to **put ideas into action**

Develop student innovation potential

Given that **ICT is one of the innovation sectors** that **drives economic and social growth**

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APPLICATION IN COURSES

University of Thessaly existing courses

Technology in Education

Game Design and Implementation

Serious Games (graduate)

Software Engineering

Advanced Software Engineering (graduate)

Machine Learning

Discrete Mathematics

Physics

University of Thessaly new courses

Design Thinking (graduate)

Design Thinking in ICT

Other universities

Aristotle University of Thessaloniki

Hellenic Open University, Patras

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STUDENT ENGAGEMENT

920 students at the University of Thessaly in 10 different courses

In the context of mandatory projects

Focus is design and innovation, related to the course objectives

Use of ICT-INOV platform

- A learning game
- A software service or application
- A learning service
- Renewable energy
- Sustainability solutions

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TYPICAL ACTIVITIES

Team building

Problem research and discovery

Analysis of users and user persona

Problem redefinition

Ideation

Evaluation of ideas and selection

Prototyping in various formats depending on project focus

- Poster, software, storyboard, user journey, …

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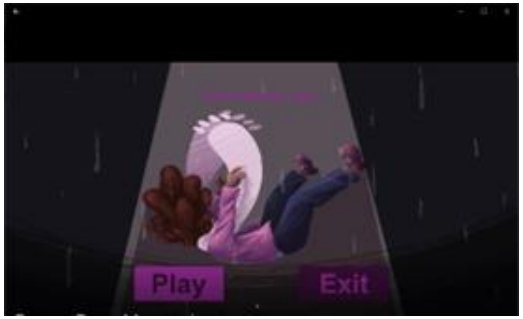
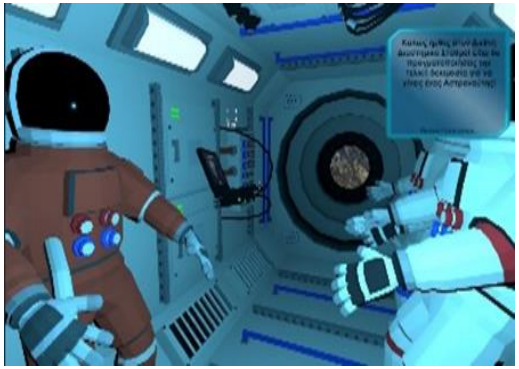
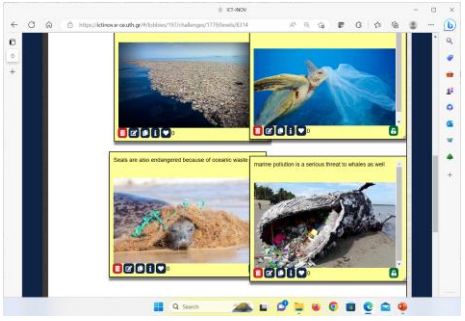
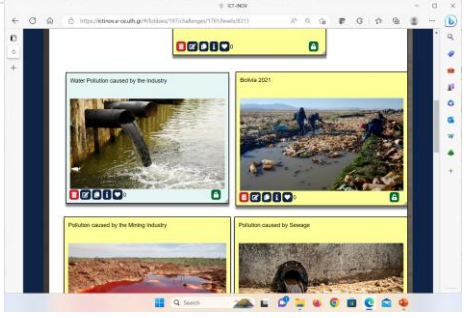
EXAMPLE STUDENT PROJECTS

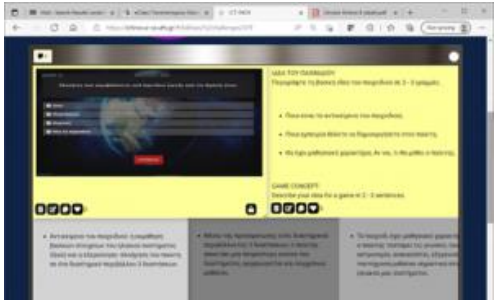


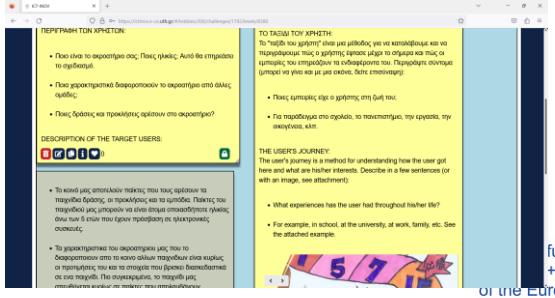


STUDENT USE OF THE ICT-INOV PLATFORM









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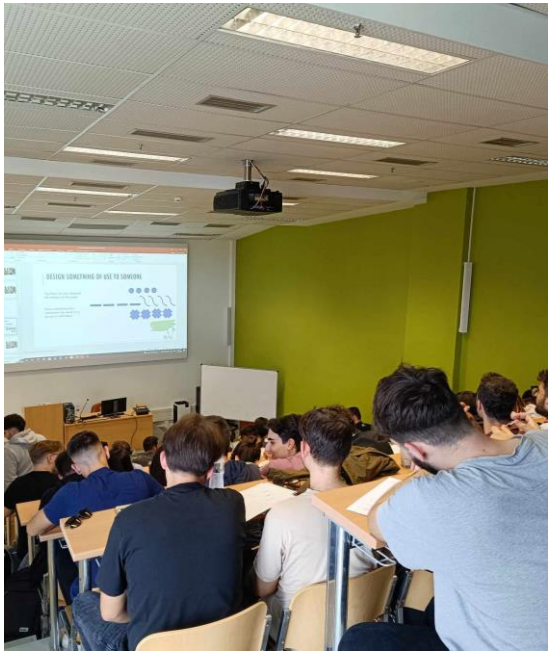

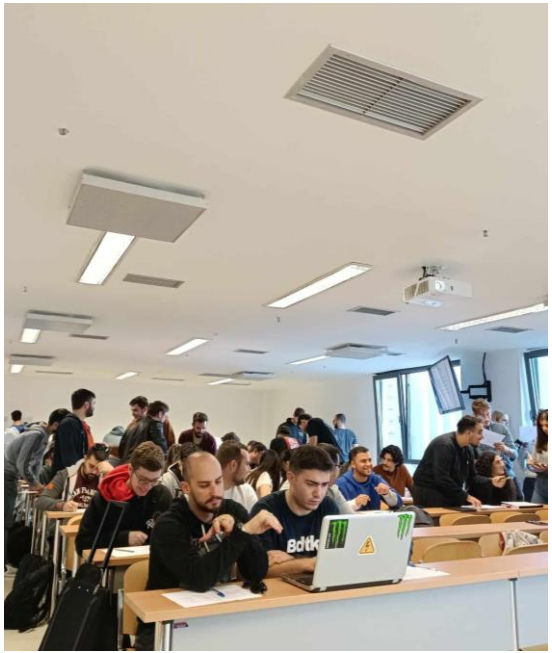

DESIGN THINKING COURSES

Two new courses added to formal curricula of the Department of Electrical & Computer Engineering

- A graduate course, first time in spring 2023
- An undergraduate course, first time fall 2023

They were needed, curriculum does not include a design course

Semester long

Workshop format

Use ICT-INOV resources from platform + more

Take students out of their comfort zone

General topic on sustainability, others apply

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FINDINGS

Very positive experience for students and educators

Challenge students to **think beyond the obvious** and to **try to really innovate**

Room setup facilitates learning

Invitations by other universities to apply in courses

Streamlining activities for the future

Future **collaboration with industry** to introduce challenges to students