Design Thinking as Methodology to Innovate Multidisciplinary Teaching and Learning

24 Feb (Thu) 12:30 - 1:45pm via zoom

Speaker
Dr. Tris Kee
CETL, HKU

Facilitator
Mr. Donn Gonda
CETL, HKU

Details and registration
www.cetl.hku.hk/coursedesign22
Content

Brief history

Using 5-stage DT in T&L

Participation using Miro
Design Thinking
“Wicked problems” Rittel and Webber, 1973

A process
Way of thinking is often organized in multiple stages

Iterative
Students explore different ideas to attain learning outcomes

Nonlinear
The process branches into multiple directions

Solution oriented
The objective of DT is more than critical thinking. The goal is to develop applicable innovations that solve problems for society

Coordinated
Clear objectives defined for students to tackle problems as a team in a structured manner
Brief history

- Cross, N. (1984) *Developments in Design Methodology*, John Wiley and Sons Ltd., Chichester,

Source: Graphic by Natasha Jen

Centre for the Enhancement of Teaching and Learning
Recent discourses on DT and IDEO


Richard Buchanan (1992)
Article on the “wicked problems” and DT as a problem-solving activity

ethnographic research - draws on the psychology of creative design processes to turn his research knowledge into forms

Schön (1983)
In The Reflective Practitioner, Schön challenged both researchers and practitioners to reconsider the role of technical knowledge versus ‘artistry’ in developing professional excellence – DT as reflexive practice

Simon himself never used the term ‘design thinking’. His cognitive approach to decision making and definition of design as ‘the transformation of existing conditions into preferred ones’ (Simon, 1996: 4)

Krippendorff (2006)
DT as Creation of Meaning

Tim Brown (2009)
Stanford University x IDEO
Samples of DT frameworks...
Stanford University’s Hasso Plattner Institute of Design: Design Thinking process

DESIGN THINKING PROCESS

UNDERSTAND

CREATE

DELIVER

EMPATHIZE

DEFINE

IDEATE

PROTOTYPE

TEST
Tim Brown’s definition

“a methodology that imbues the full spectrum of innovation activities with a human centered design ethos.”

Tim Brown, June, 2008
How to engage class participants in this 5-staged DT?
1. Empathize

Encourage students approach the context of inquiry from multiple points of view

- Step 1 – Observe
- Step 2 – Engage
- Step 3 – Immerse
Empathize tools examples

Conduct interviews

Conduct initial research by Empathy Map (on-line versions using Padlet / Miro)

Probe questions by Journey map

Conduct interviews
Learners will come up with an interview plan and conduct an interview.

Learners will...
- Prepare interview guides and open-ended questions.
- Conduct and conduct an interview.
- Understand how to practice empathy when conducting research.

Conduct initial research by Empathy Map (on-line versions using Padlet / Miro)

Probe questions by Journey map

Centre for the Enhancement of Teaching and Learning
Empathy map

Example of an empathy map for product engineering (Guzzo, 2016)
2. Define

Clearly articulate the main issue of inquiry so students can stay focused/coordinated.

Provide meaningful and actionable problem statement – in line with learning objectives (PLO, MLO etc.).

Analyze

Arrange

Articulate
3. Ideate

Stimulate creatively and generate class discussions

Trans / interdisciplinary collaboration

Social impact

Critical thinking
Case Study

IDEActivity Centre – DT Flipped Classroom

Design Thinking via Flipped Classroom
Canina and Bruno, 2018, Polytecnico di Milano paper at International Conference on Engineering Education at the Dyson School of Design Engineering, Imperial College.

On line version: Perusall

https://www.designsociety.org/publication/40800/DESIGN+THINKING+VIA+FLIPPED+CLASSROOM
Brainstorming

- Quality through quantity
- Refrain from judging ideas
- Interdisciplinary collaboration
Co-creation workshops

- “Break the ice” and dispel shyness among participants
- Collective creativity
- Suggested on line version – Mentimeter / Miro
Menu of ideas

- A catalog displaying a synthesis of all ideas generated
- Document the partial result for feedback / feedforward
- Suggested on-line version: ConceptBoard / Notion
Decision matrix

- Strategy tool for analysis
- Validate guiding criteria
- Show how ideas meets requirements

Example of decision matrix (Loh, Kwek and Lee, 2017)
4 Prototyping

To aid the validation of ideas generated and presented as an outcome from DT

HKU Faculty of Dentistry develops a mouth guard device with micro-mist injection for improving oral condition of elderly and disabled people

(source: https://www.hku.hk/press/news_detail_21939.html)
Prototyping can take many shapes
1. Paper prototyping
2. Presentation
3. Staging scenario
4. Story board
5. Service prototyping
6. Scaled Models
7. Virtual Reality (VR/AR)
8. Infographic
Story board

Well defined ideas to be communicated, eg.

- Screen play
- Comic strips
Rapid prototyping / 3D printing

User-interface
Schematic ideas

Executed by hand, on computer

Evaluate the information, validate hypothesis
Scaled models / building information model

T&L technology such as BIM, AutoCad, Rhino

Animation to simulate real-life context

360 degree immersive experience for students

Multidisciplinary engagement – Heritage Conservation, Landscape, Architecture, Real Estate and Construction, Building Engineering

Virtual Field Trips using EasyVR, 360, Metterport
5. Testing

Offers reflection, constructive feedback and feedforward to students

Peer-review
DT empowers learners to become... ignited, inspired and innovative

Active and experiential learners
Proficient in multitasking
Dependent thinkers on communication
Collaborative and interactive
From Principles to Strategies to Practice
A Series on Online Course Design for Better Learning Experience

Miro participation
Practice by Miro using a simplified DT framework
1. click to Miro link
2. please press “n” to initiate a post-it notes on Miro and input your particular course and what activity would you use in the 5 DT stages
Thank you
Q & A
Survey