Enhancing Design Thinking Skills in VTC Curriculum

HQ(AS)
27 May 2016
In 3-year Strategic Plan for 2016 – 2019, competencies of the 21st Century have been identified.

Aim to develop students into an integrated person, a useful contributor to the community and a global citizen.
21st Century Competencies

21st Century Student Competencies

Integrated Person
- Vocational and Design Thinking Skills
  - Trade specific professional competencies
  - Information skills
  - Creative and innovative thinking
  - Pragmatic and user-centred solutions
- Team Management Skills
  - Effective communication
  - Ability to work and collaborate with others
  - Positive contribution in groups
- Inter-cultural Networking Skills
  - Strong sense of civic responsibility
  - Global awareness, appreciation of socio-cultural differences

Forever Learner
- Core Values
- Ethics
- Etiquettes
- Self-management Skills
  - Self-awareness
  - Think independently and discerningly
  - Make responsible decisions

Global Citizen

Positive Contributor

Source: Vocational Training Council
Entrepreneurship

- A wide definition:
  - Ability and willingness to create values for others
- Core competence: to turn ideas into action
- Attitude: passion to excel
Entrepreneurship

**Self-efficacy:**
Can do

**Proactiveness:**
Initiate actions

**Perseverance:**
Willing to persevere

**Innovativeness:**
Embrace novelty

**Uncertainty tolerance:**
Dare to risk

Create values

Use of relevant knowledge

Employ associated skill sets

RESTRICTED
Design Thinking

https://youtu.be/a7sEoEvT8l8
• Understand user experience
• Observe, engage, immerse

• Generate radical alternatives
• No constraints of existing solutions
• Minimise fear of failure & maximise input

• Construct an actionable problem statement

• Put ideas to tangible form
• Inter-disciplinary collaboration
• T-shaped team members

• Feedback to continuously refine or re-define

Image source:
http://weelearning.co.uk/wordpress/wp-content/uploads/2013/02/DT-five-step-model1-1024x419.png
Design Thinking

• A thinking process
• A method to create new options / better solutions for all sorts of needs
Design Thinking Skills & Entrepreneurship

- Can be acquired and practiced by all
- Equip youth with competencies to prosper in 21st century
- Help maximize students’ potentials and realize their aspirations through structured approach
- Make academic learning and life skills relevant
## Examples

<table>
<thead>
<tr>
<th>Health/society</th>
<th>Business</th>
<th>Society/business/general</th>
<th>Interactive Media</th>
<th>Engineering</th>
<th>Culture/hospitality/tourism</th>
<th>Tourism</th>
<th>IT</th>
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<tr>
<td>Unite For Sight (U.S.)</td>
<td>University of Ljubljana (Slovenia)</td>
<td>The Nueva School (U.S.)</td>
<td>PolyU (HK)</td>
<td>Santa Clara University (U.S.)</td>
<td>University of Ciputra (Indonesia)</td>
<td>American University in Bulgaria</td>
<td>The Pennsylvania State University (U.S.)</td>
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| Certificate in Social Entrepreneurship | Bachelor’s and master’s/ MBA | 7th and 8th grades in secondary curriculum | Bachelor of Arts in Interactive Media | Bachelor’s under School of Engineering | Bachelor of Tourism | Entrepreneurship in Tourism workshop | Entrepreneurship and Innovation minor |

| Stand-alone modules on specific/integrated topics on entrepreneurship, design thinking and/or health | Stand-alone modules, plus extra-curricular activities like start-up weekends | Entrepreneurship elective module with design thinking approach, coupled with seminars by speakers from industry/social organisations | Design thinking embedded in programme with stand-alone module on entrepreneurship for interaction designers | Elective cluster of modules for holistic approach to new product/process development | Projects to organise profit-generating cultural event, innovate services and plan business, plus internship | 5-day workshop to develop simulation of tourism start-up, incl. meetings/Skype sessions with industry reps | Cluster of modules focusing on impact of IT-driven innovation |
What VTC is Doing

• Examples in curriculum:
  – Design Thinking module in BA (Hons) in Advertising (THEi)
  – Creative Thinking module in DE NHD (elements of empathising and ideating, etc.) and prototyping in other modules
  – WPD Self-efficacy module in NHD
  – “i-Business Startup” enrichment module in NHD (elements of brainstorming, marketing, financial planning, etc.)

Examples in co-curricular learning activities:
  0 BA students’ Lunar New Year stalls
  0 SWAN’s multidisciplinary T Hotel elderly model suite design competition for DE, HoSTS and IT students
  0 ENG’s SOPHIE solar car project
Design Thinking and Entrepreneurship in VTC Curriculum

- Discrete
- Discipline-specific
- Less structured
- Event-based
- Optional (for most programmes)

Our Target
- Immersed
- Interdisciplinary
- More structured
- Regular
- Mandatory
Create values for others.
Implementation
The Approach

• To implement Design Thinking Skills (DTS), with Entrepreneurship elements embedded, initially in HD, with 2016/17 new intake onwards
  • 2015/16 progressing students to benefit where possible

• Update / inclusion of DTS in HD curriculum
  • Refinements at module level where appropriate
How (1)

• **Familiarization:**

• **Delivery in relevant modules**
  • (e.g. IA, Final Year Project, etc.)

• **Application:**

• **DTS being one of the assessment components in relevant modules**
  • (e.g. applying relevant skills in IA/ Project, etc.)
How (2)

- Structured delivery package (proposed 3 hours), with Discipline specific application examples
  - For adoption and/or adaptation by Disciplines
- Student self-study e-learning package
- An enrichment Module on Design Thinking offering to all HD students
Support

• Awareness seminar
• Staff training
• Structured delivery package to facilitate delivery
• Working Group to coordinate
Thank You
Intelligent Hotel Room for the Elderly

A special design of the bedlamp, it can change the angle and direction randomly, convenient for the elderly when they are reading book on the bed.

Image source:
Intelligent Hotel Room for the Elderly

A hidden handrail, if the guest need armrest to help get up, just need to pull up the handrail.

A special design bed, it can change the angle of the bedside, convenient for the elderly if they want to sit on the bed or get up.

Image source:
Intelligent Hotel Room for the Elderly

Intelligent Hotel Room for the Elderly

Shower with bathtub have a hidden chair, if the elderly feel tired when they having shower, they can sit and rest. The user can pull up the chair when they want to have a bath. Also the shower have a LED light to provide enough light for bath.

Timeline of development of SOPHIE:

**Origin of SOPHIE**
In only four months, the SOPHIE I was born. It is the first ever SOPHIE built by IVE (TY) and also the first solar-powered vehicle that was completely designed and built in Hong Kong.

**SOPHIE draws great attention from the Secretary for the Environment**
The SOPHIE team-members were delighted to introduce the SOPHIE to the Secretary for the Environment of the Hong Kong Government, Mr. Edward YAU Tang-wah, GBS, JP.

**SOPHIE III**

2010
2011
2012
2013
2015

**MAY**
**JUL**
**JUL**
**OCT**

**The MIT connection**
Four members of the MIT Solar Electrical Vehicle Team (SEVT) were invited to share their invaluable experience on the design of solar vehicles with particular emphasis on the mechanical systems, electrical and control systems, aerodynamic designs and body fabrication with lecturers and students from IVE.

**2nd place in Shell Eco Marathon**

**SOPHIE V**

**4th place in World Solar Challenge**

**SOPHIE IV**

**SOPHIE SEM**
Design Thinking in Practice

- Study WSC requirements, Australian Gov’t laws and regulations
- Observe the race in-person
- Discuss challenges with industry practitioners
- Share experiences with WSC competitors

- Brainstorm, discuss, debate
- Research, design, innovate
- Build prototypes out of papers, cardboards, foams, etc.
- Infuse electrical, electronic, mechanical components with novel engineering ideas and concepts

- Project definition - A solar race car that meets WSC and Australian Gov’t requirements based on staff’s and students’ vocational knowledge and skills within a given timeframe and budget
  
  - Plan, test, analyze, construct
Societal Impact

• **1st** solar car running on Hong Kong highways (Jun 2015)
• **234** students participated in the design and construction of the project
• Over **2,100** IVE and secondary school students visited the SOPHIE workshop
• **275,880** SOPHIE Facebook hits (up to 16 Jan 2016)
• Over **110** news reports
• An inspiration for the **1st** local solar car competition