

Learning Outcomes of Design

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OCAD University
Industrial Design**



**Learning Outcomes
Practically Speaking
Conference April 2013**

This Workshop

Design?

Curriculum overview

Student experience

Case study

Exercise

Design?

A dense collage of numerous small images illustrating various aspects of industrial design. The images include: product renderings of everyday objects like chairs, bicycles, and kitchen appliances; conceptual sketches and wireframes; physical prototypes and models; and scenes of user interaction with products. Some images feature text overlays such as "one good chair" and "DON'T THROW ANYTHING AWAY. THERE IS NO WAY!". The collage represents a comprehensive overview of the industrial design process, from initial ideation to final product realization.

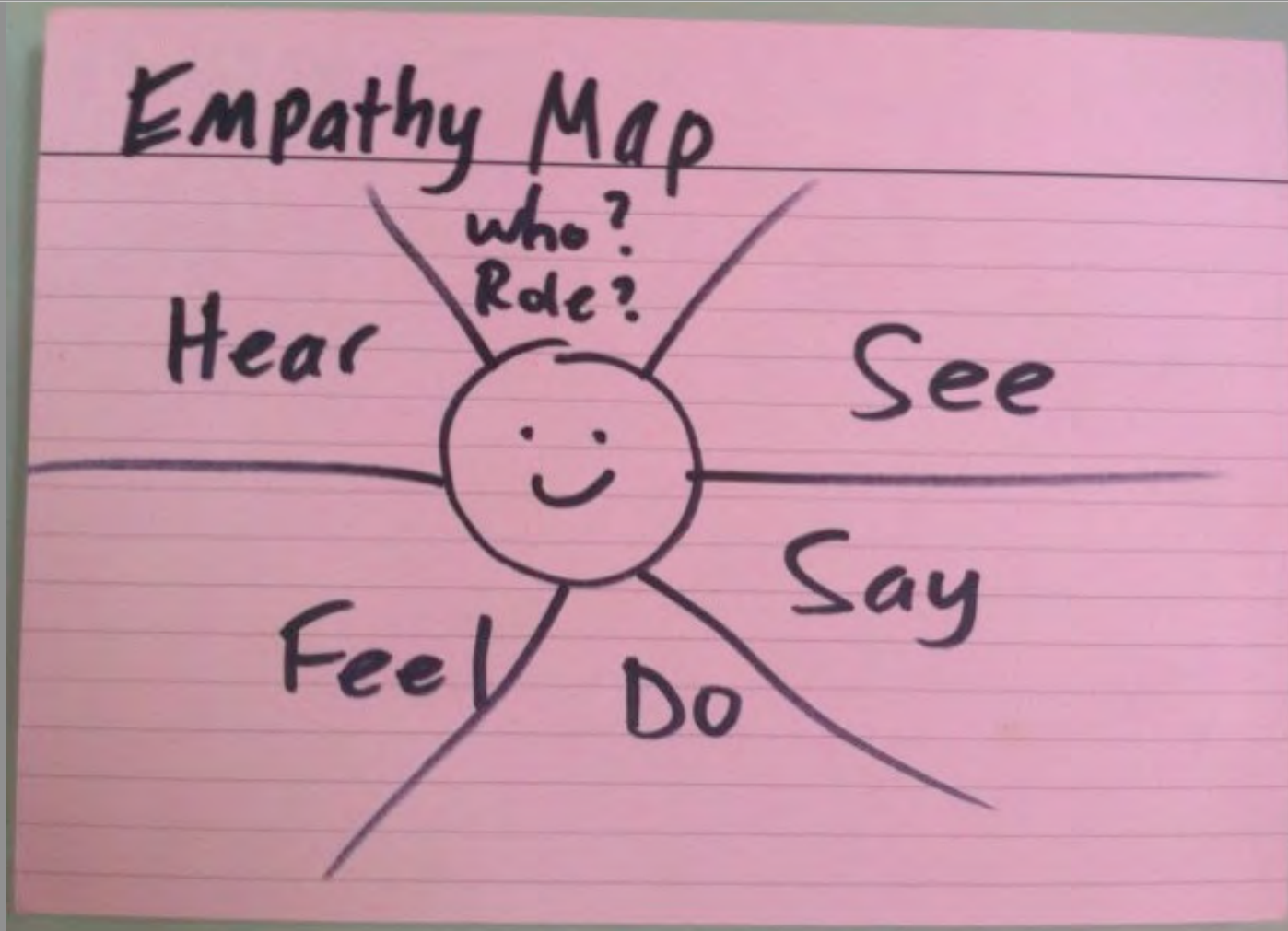
Design = knowledge



Design = doing



Design = feeling



Current curriculum

Curriculum: fragmented

INDS 3828	ID Studio 4: Design for Flow Space †Δ	0.5
INDS 3809	Thesis Preparation & Research (SEM) †	0.5
INDS 3831	Activist Design	0.5
Choose one expansion studio from the list provided at the end of this document.		0.5

400 LEVEL: FALL SEMESTER

PLEASE PAY CLOSE ATTENTION TO COURSE DESCRIPTIONS FOR SPECIFIC CONDITIONS REGARDING ADVANCEMENT TO FUTURE COURSES.

See Faculty of Liberal Arts & Sciences	Choose one liberal studies course	0.5
INDS 4807	Context and Departure Points	0.5
Choose one:		1.0
INDS 4C01	Thesis I: Planning to Direction Definition †Δ	
INDS 4C03	4th Year Product Design Studio 1 †Δ	
Choose one expansion studio from the list provided at the end of this document.		0.5

400 LEVEL: WINTER SEMESTER

PLEASE PAY CLOSE ATTENTION TO COURSE DESCRIPTIONS FOR SPECIFIC CONDITIONS REGARDING GRADUATION REQUIREMENTS.

See Faculty of Liberal Arts & Sciences	Choose one liberal studies course	0.5
INDS 4809	Professional Preparation (SEM)	0.5

Choose one:		1.0
INDS 4C02	Thesis II: Business Validation to Final Presentation †Δ	
INDS 4C04	4th Year Product Design Studio 2 †Δ	
Choose one expansion studio from the list provided below.		0.5

Recommended Expansion Studio Courses (subject to being offered):

GDES 3838	Ambient Experience Design
GDES 3867	Applied Materials for Designers (not offered 2012/13)
GDES 3845	Architectural Ceramics
GDES 3810	Art of Presentation
GDES 3818	Biomimicry 1: Points of Departure
GDES 3828	Biomimicry 2: Application
MAAD 2B24	Ceramics: Mouldmaking
GDES 3879	Children's Toy Design & Invention
GDES 3863	Cities for People/Summer Workshop (offered summer 2012)
GDES 3813	Compelling User Experience 1
GDES 3873	Critical Design Studio (not offered 2012/13)
GDES 3821	Designing Across Difference: Aboriginal Communities
GDES 3836	Domestic Ceramics: Exploring the Useful Object
GDES 3840	Exploration, Insight and Foresight in Design (SEM)

Curriculum: no LO progression

They should have developed this awareness two years ago

1. The student will demonstrate knowledge of contemporary design issues by:
 - a) Exploring their impact on the development of meaningful design solutions.
 - b) Developing an awareness of the different stages of the design process.

c) Exploring the skills needed to express ideas.

2. Students will learn a methodology of innovation by:

a) Exploring, analyzing, refining and communicating design concepts

b) Synthesizing and integrating the principles of three dimensional design

c) Understanding graphic applications, drawing and prototyping and applying

the generation of useful and meaningful form

Students will begin to understand the requirements of mass distribution by:

a) Developing the use of semantic and symbolic aspects of industrial design.

b) Understanding the functional and cultural meanings of products.

c) Analyzing the conceptual direction of objects for mass distribution.

4. Students will become proficient in collecting information by:

a) Demonstrating proficiency in research.

b) Analyzing, and applying information.

Where will they continue to learn on this?

This is ongoing, we need to be more specific what level...

Curriculum: ambiguous language

*Each year both faculty
and students ask
themselves what this
means.*

Course Outline

INDS 3B28 ID STUDIO 4: **DESIGN FOR FLOW SYSTEMS**

Date: Winter 2013

Curriculum Stream: Design

Location: room # 542

Course Section: 04

Semester: Winter 2013 |

Credit Value: 0.5 |

Class Time: 3 hours

Curriculum: the need to redesign



*“You cant fix by analysis
what is flawed by design”*

Bottom up: Student experience

Student Experience

How is this student learning Design?



Evi K. Hui – Design furniture for Palliative Care

Student Experience

She is feeling limitations bed ridden patients experience.



Evi K. Hui – Design furniture for Palliative Care

Student Experience

She is thinking holistically about a patient's needs.



Evi K. Hui – Design furniture for Palliative Care

Student Experience

She is sketching bedside furniture suiting patients needs.

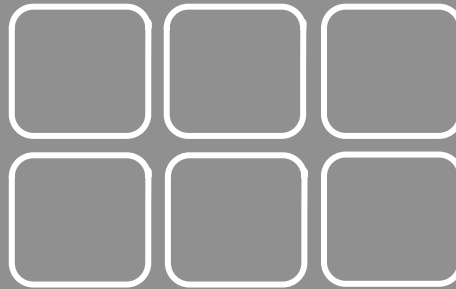


Evi K. Hui – Design furniture for Palliative Care

Desired learning Experience



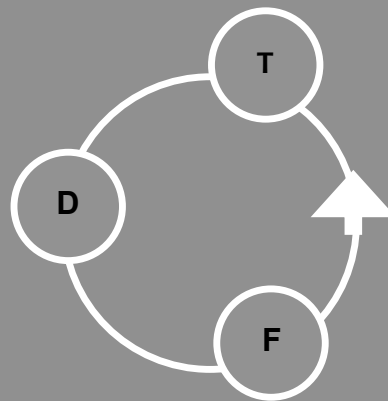
Feeling



Doing



Thinking

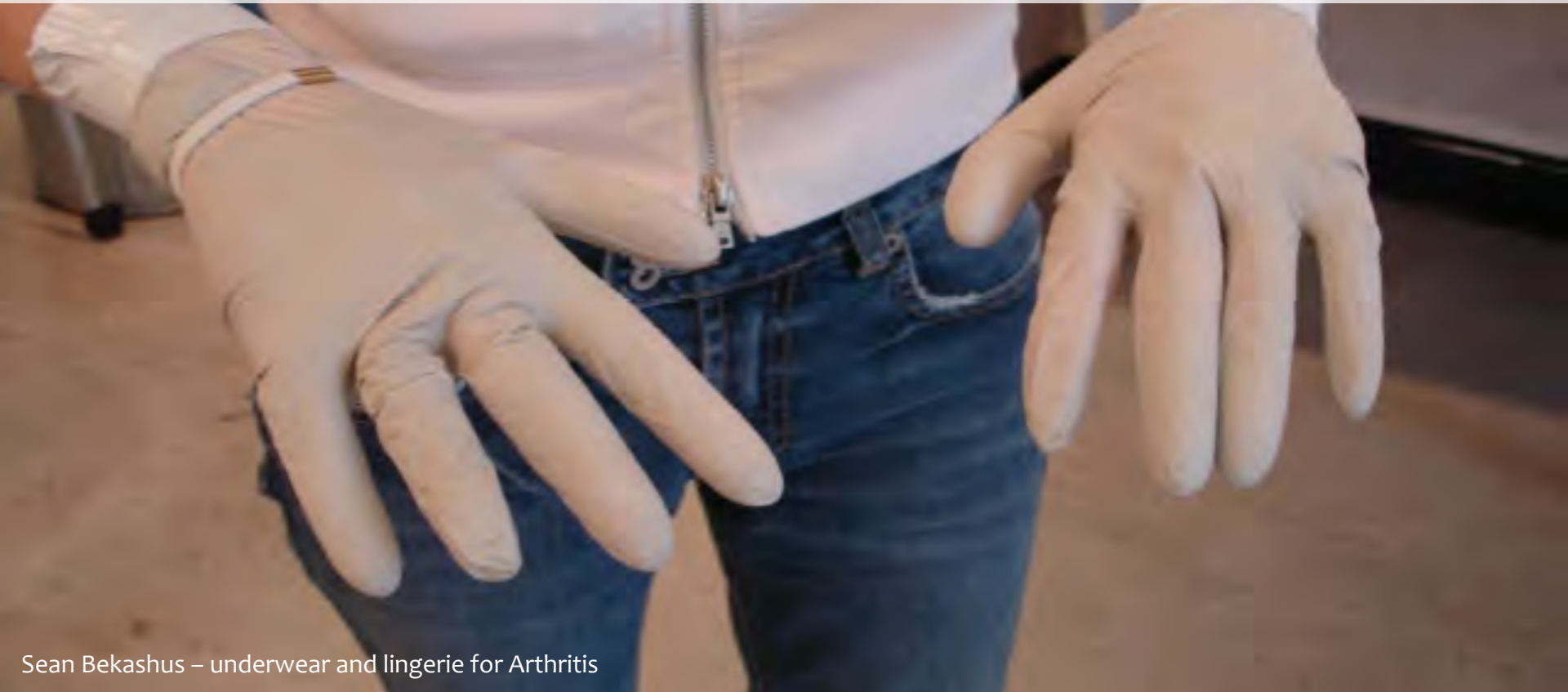


Feeling



Empathy

Understanding what it is to be like in the shoes of the people for whom designers create solutions



Sean Bekashus – underwear and lingerie for Arthritis

Intrinsic Motivation

Alyssa– Sanding her lounge chair flat after critique



A deep engagement to a project. Taking it personal and wanting to achieve quality.

Openness



Jenny Soojung Park – Mobile Furniture for City Dwellers

Openness to all kinds of experience, particularly to influences that are relevant to the challenge at hand.

#1 CLASSIC BEDROOM

Courage

***Not knowing the outcome, 'finding' the result along the way.
Overcoming fear of exposing your imagination to others.***

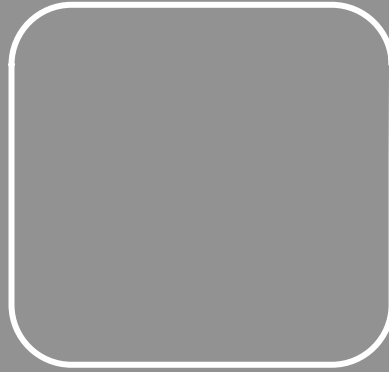
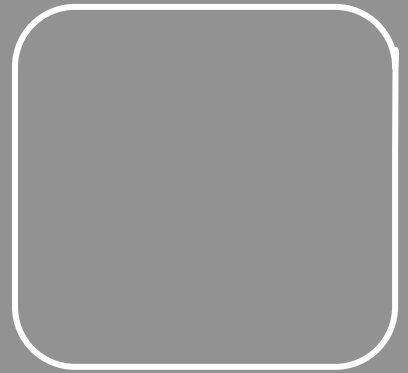
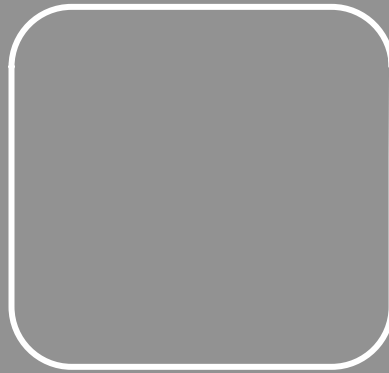
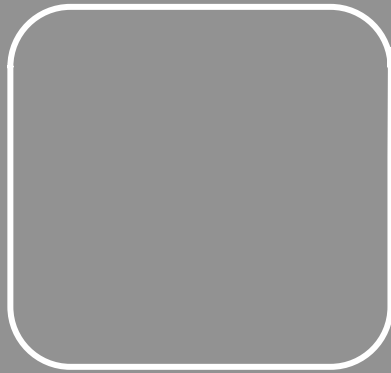


Communication

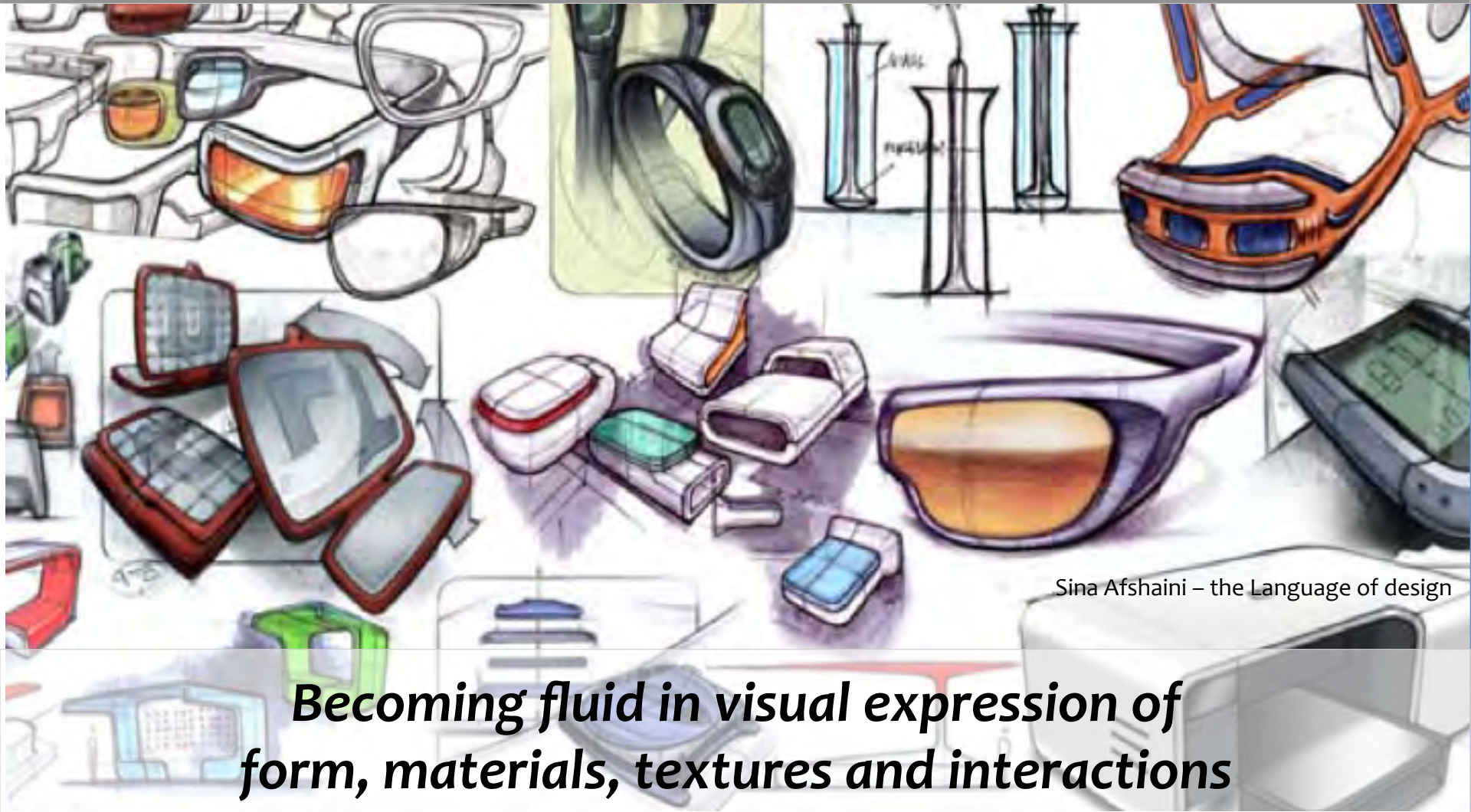
Being able to communicate and collaborate in teams along the design process



Doing



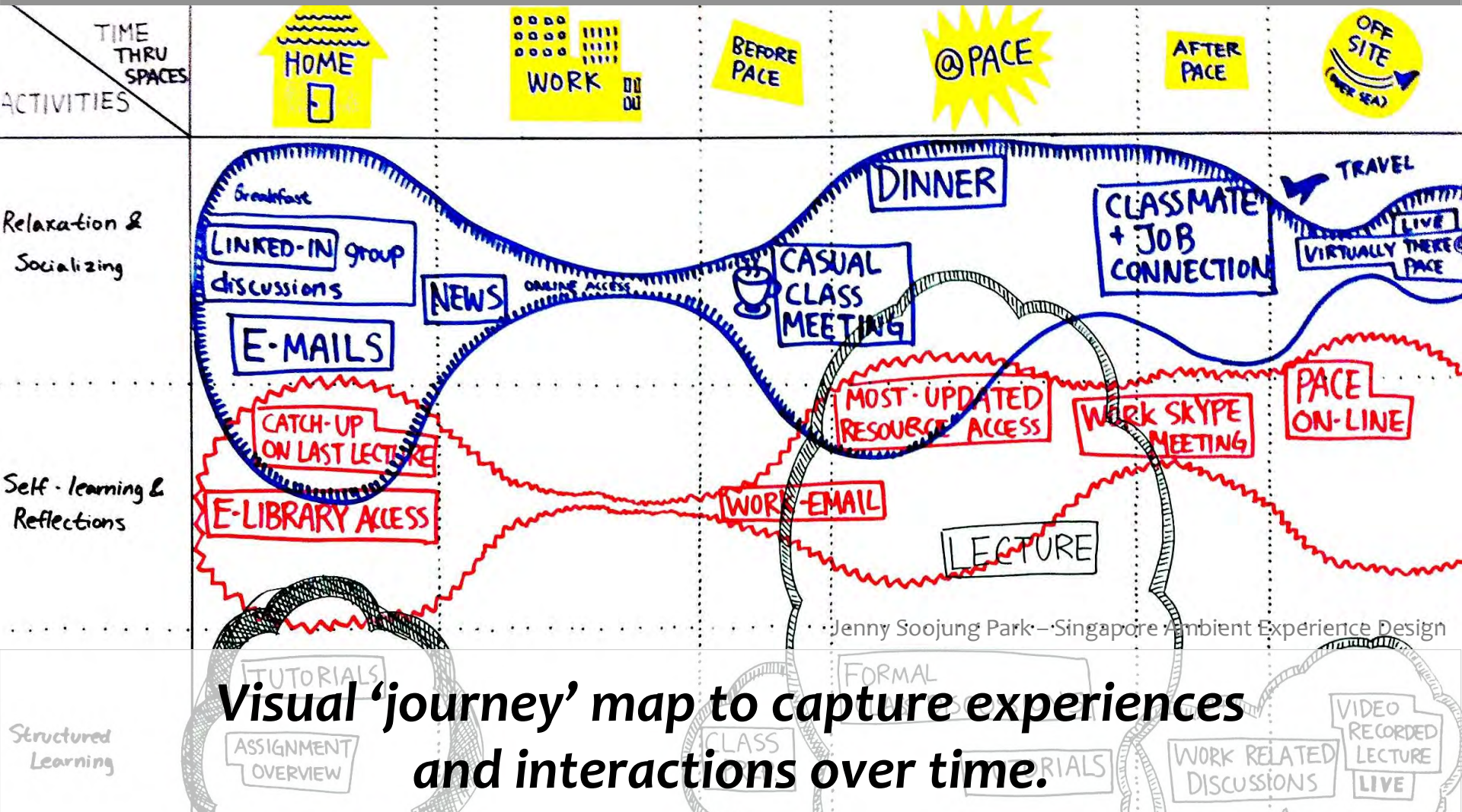
Visualization Methods



Sina Afshaini – the Language of design

***Becoming fluid in visual expression of
form, materials, textures and interactions***

Experience Design



Diagramming

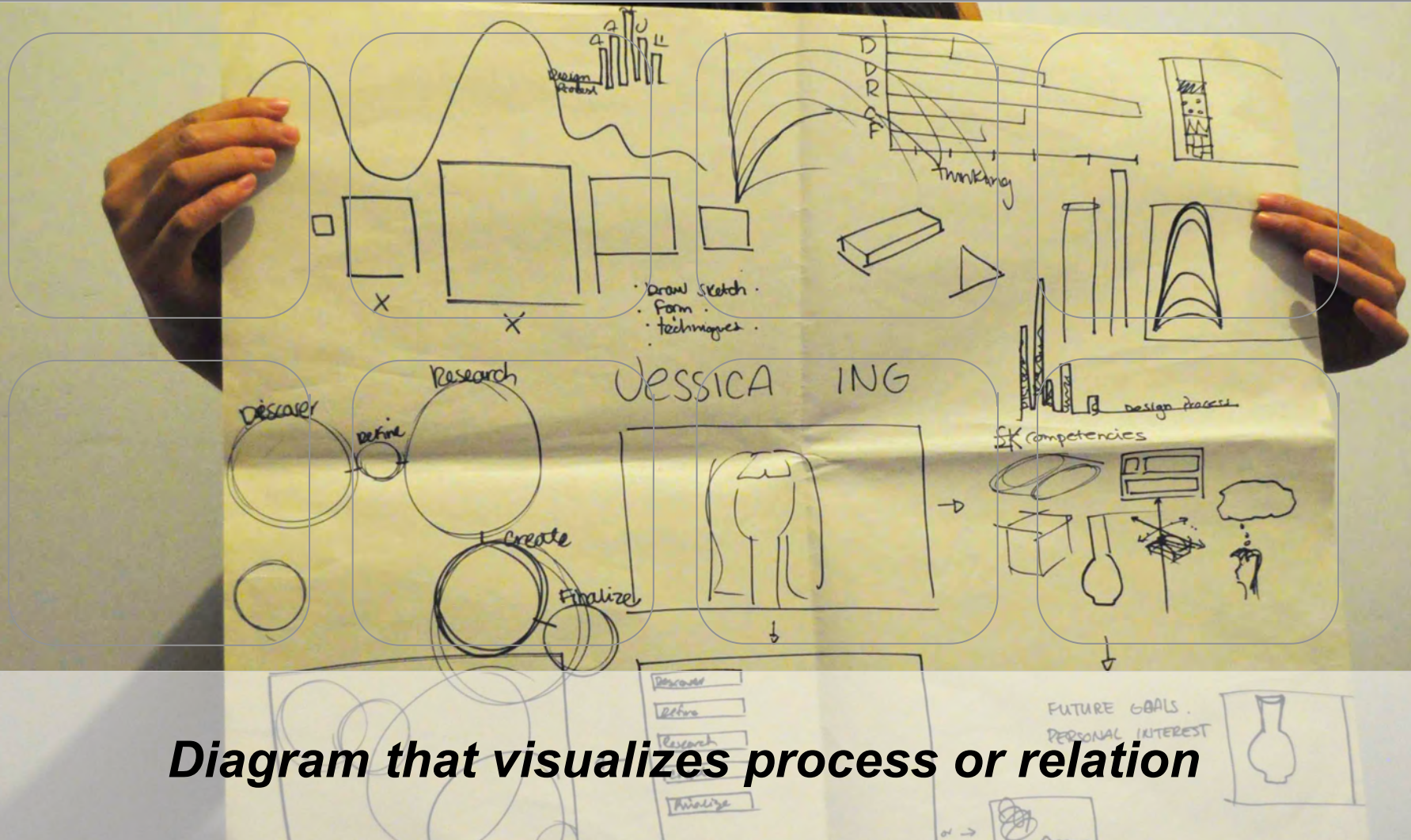
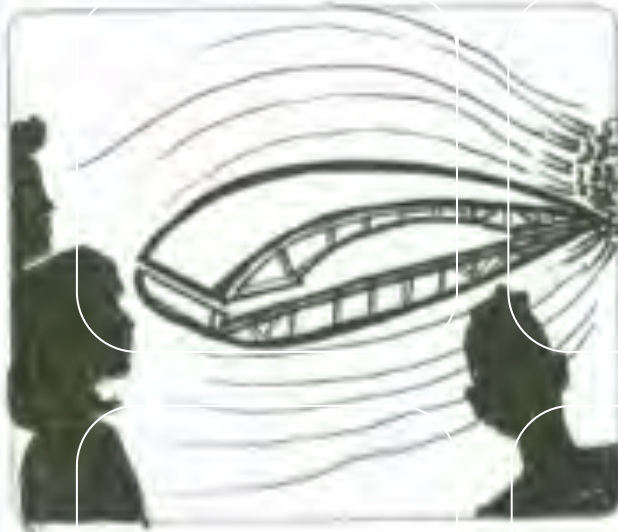
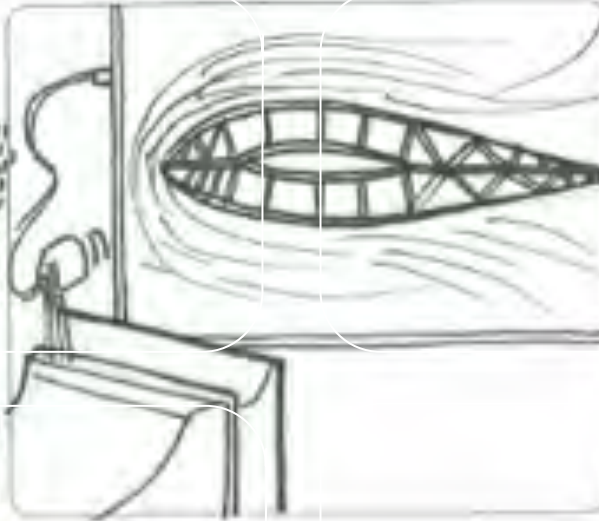


Diagram that visualizes process or relation

Story Boarding



The bubble flow demonstrator has set the students up for an experiment with the wind tunnel. An airplane wing element, made by students, is being tested.



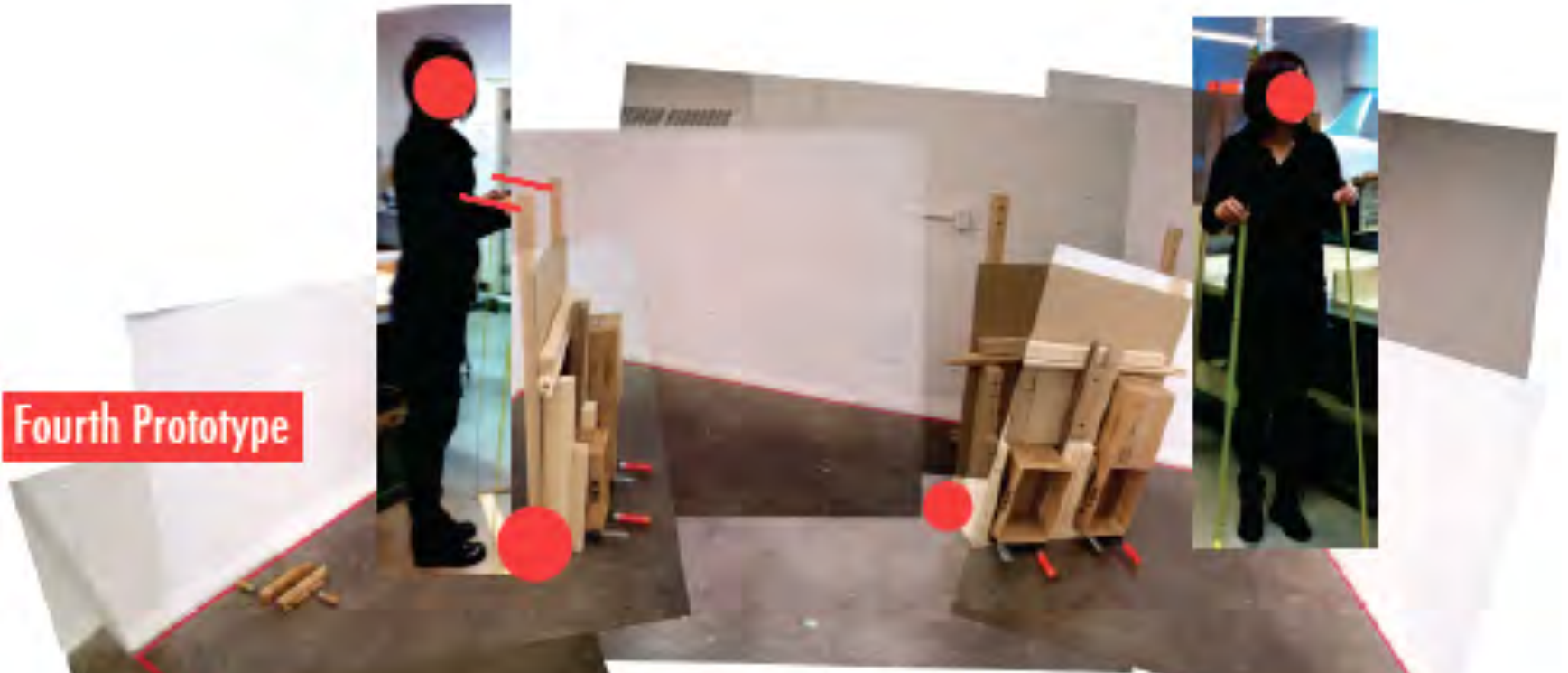
A camera inside the wind tunnel is able to record the wind movement and turbulence around the wing.



After the experiment and the analysis of the video recordings, the students get a lecture on the math formulas used to calculate wind turbulence.

Iterative Prototyping

Jenny Soojung Park – Mobile Furniture for City Dwellers



An ongoing creation of ‘Low Res, high Fidelity’ process models to stimulate thinking

Thinking



Convergent & divergent

Divergent thinking to generate ideas; convergent thinking to select and synthesize ideas.

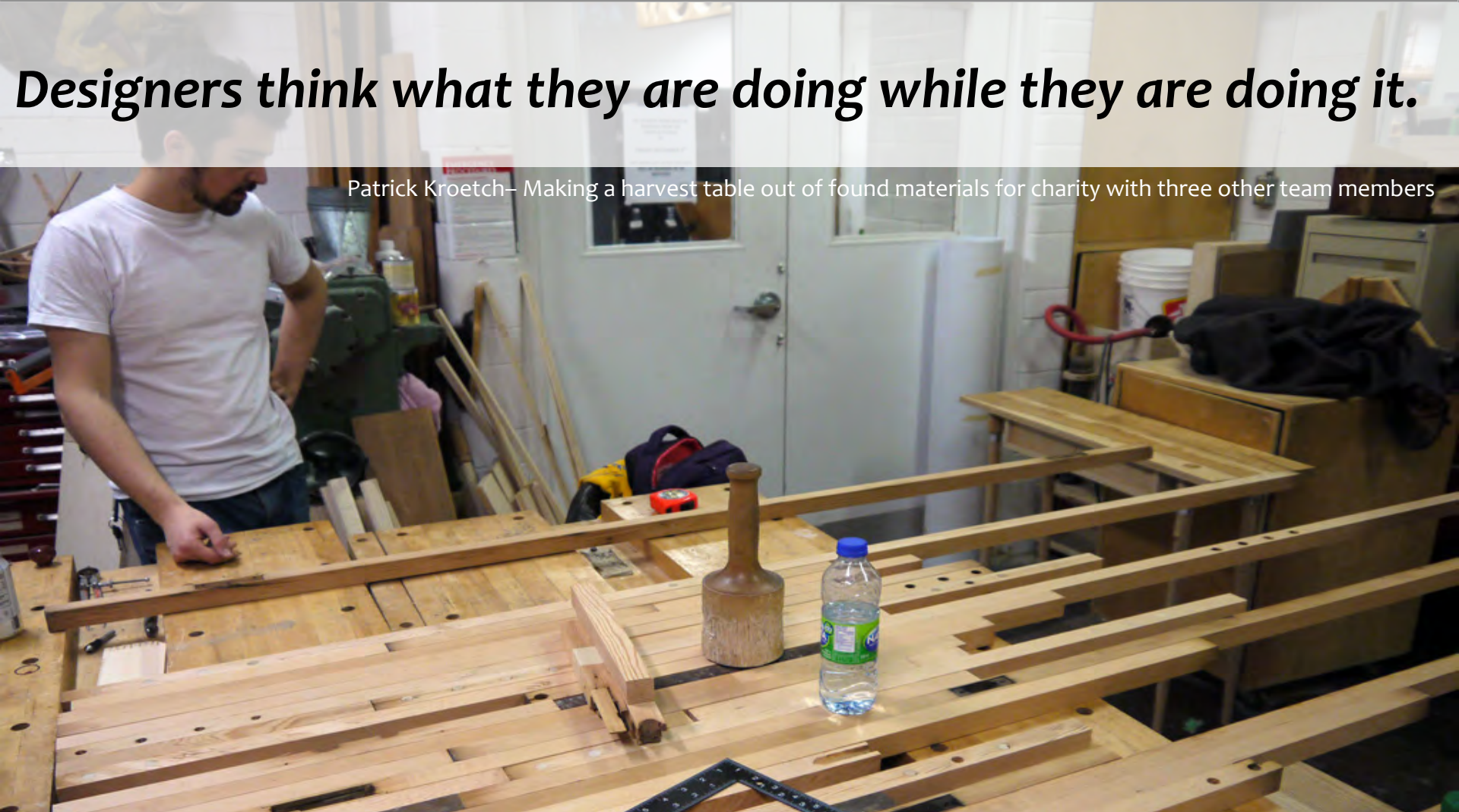


Jenny Soojung Park – Singapore Polytechnic workshop

Thinking situated-in-action

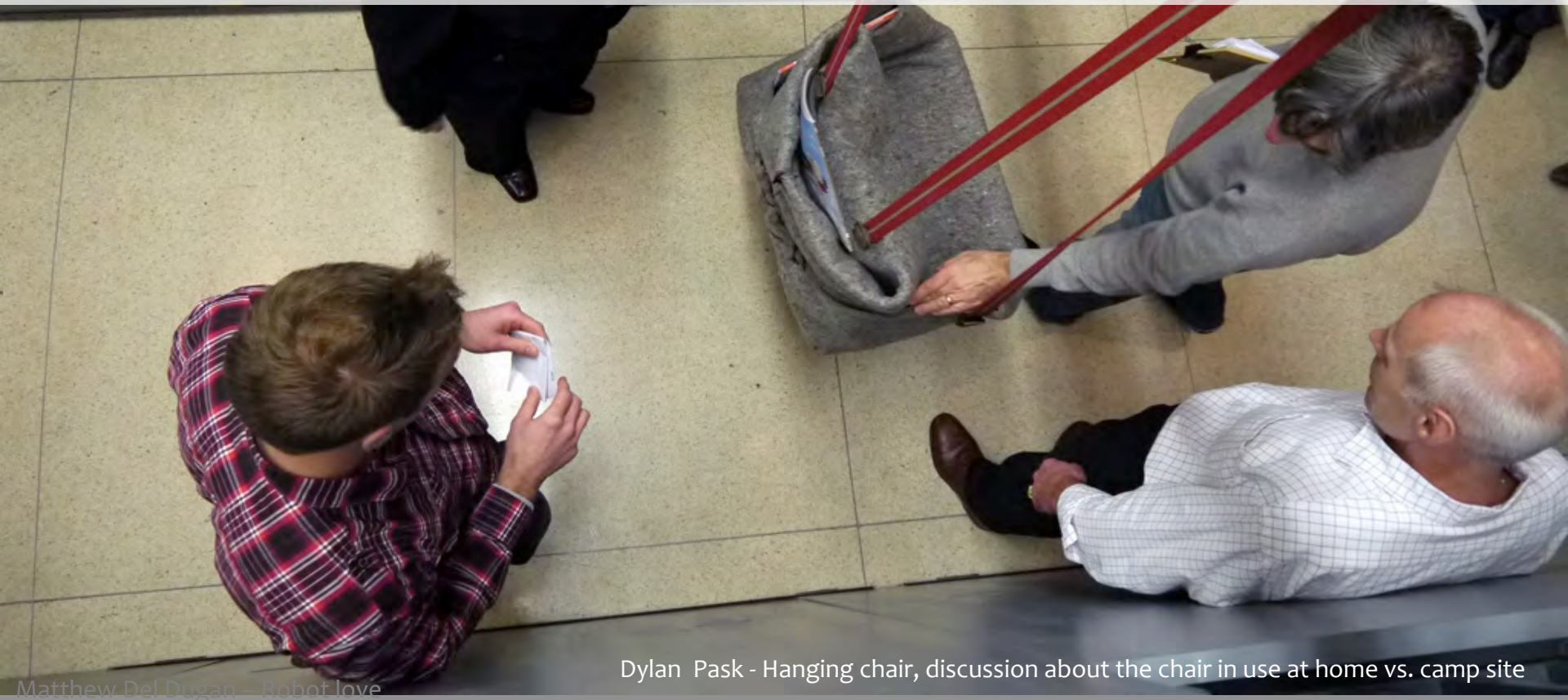
Designers think what they are doing while they are doing it.

Patrick Kroetch— Making a harvest table out of found materials for charity with three other team members



Spatial & visual thinking

In an intuitive way, learn to think through shapes, spaces, locations and relations.

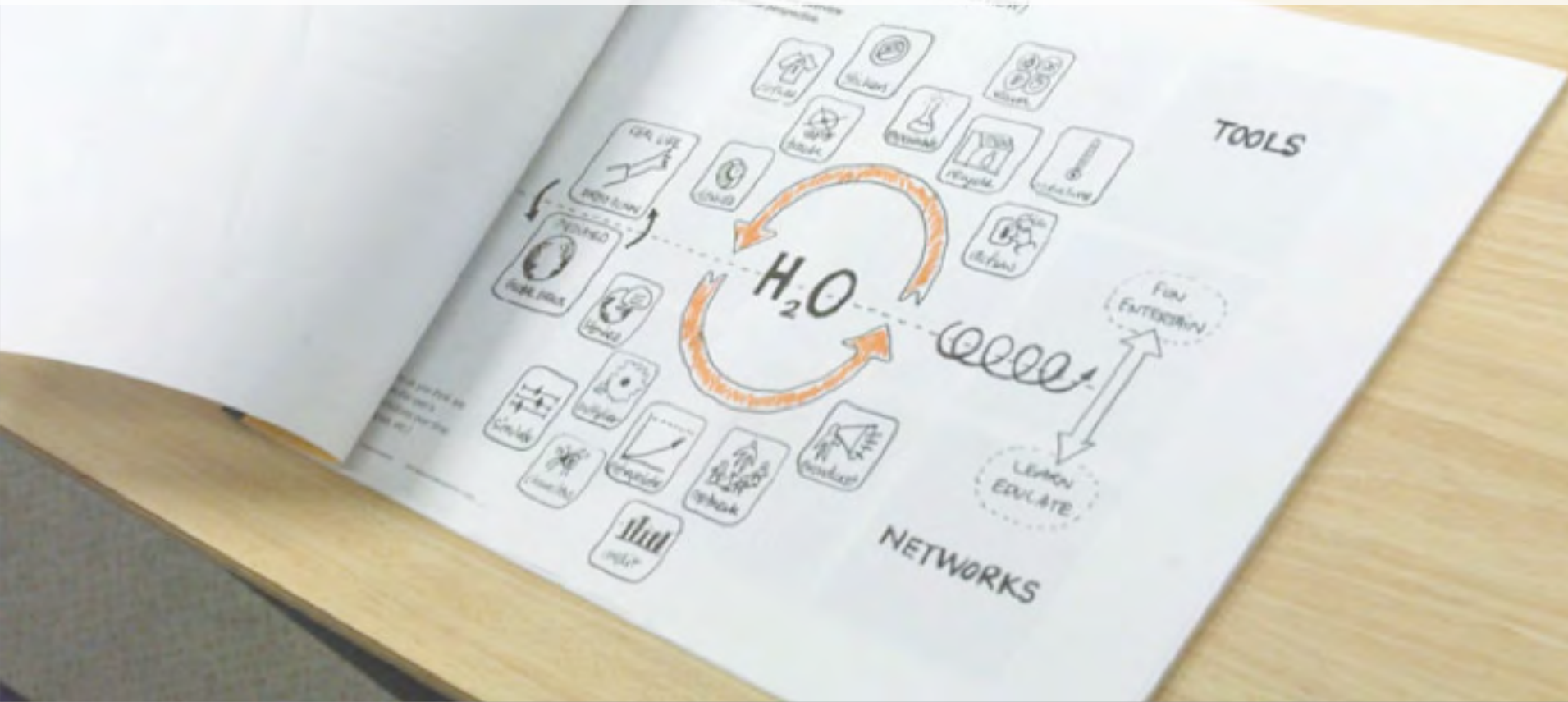


Dylan Pask - Hanging chair, discussion about the chair in use at home vs. camp site

Matthew Del Dugan - Robot love

Systems Thinking

Everything is connected to everything. Products and services increasingly are part of an 'eco system'



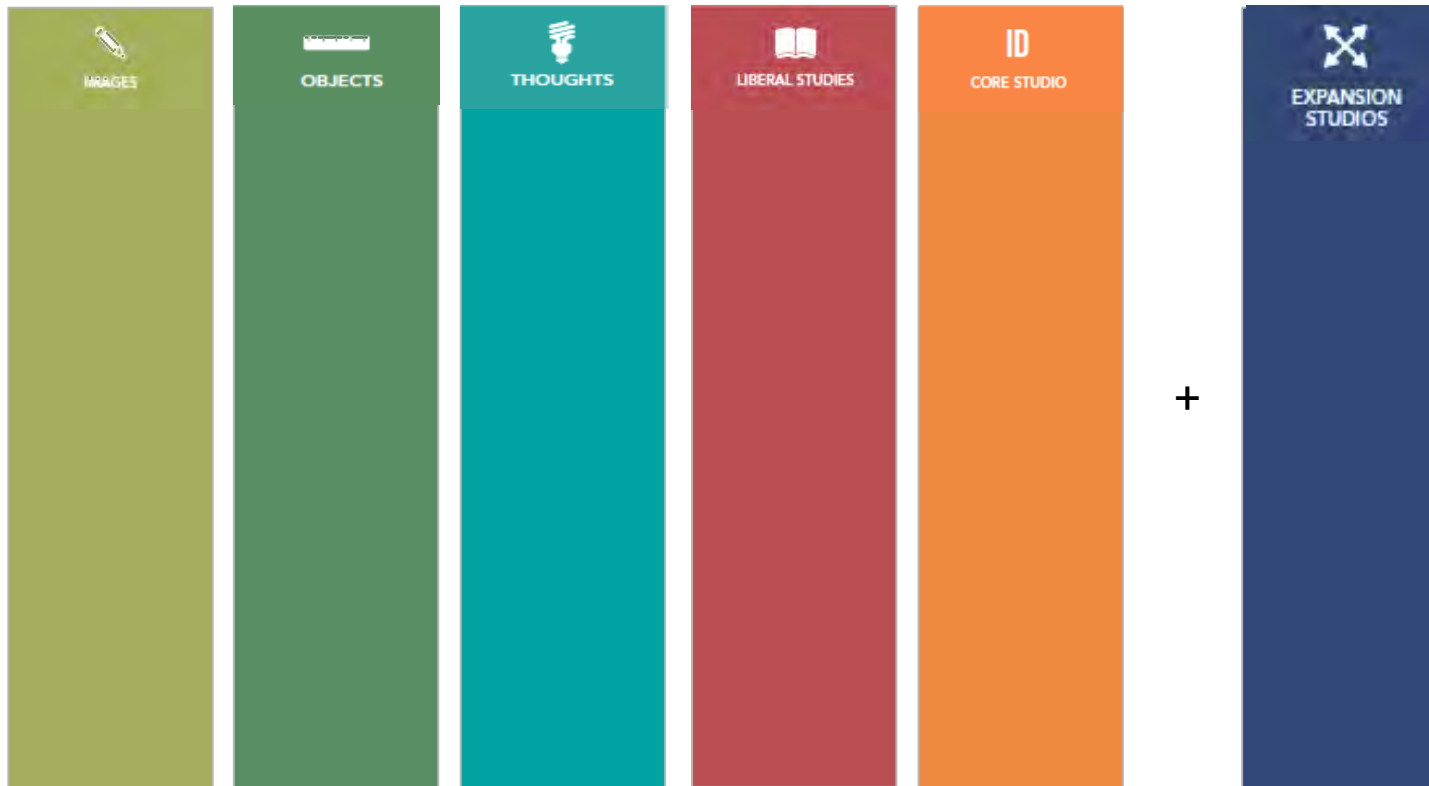
Synthesis

Making sense out of patterns, seeing the bigger picture



How?

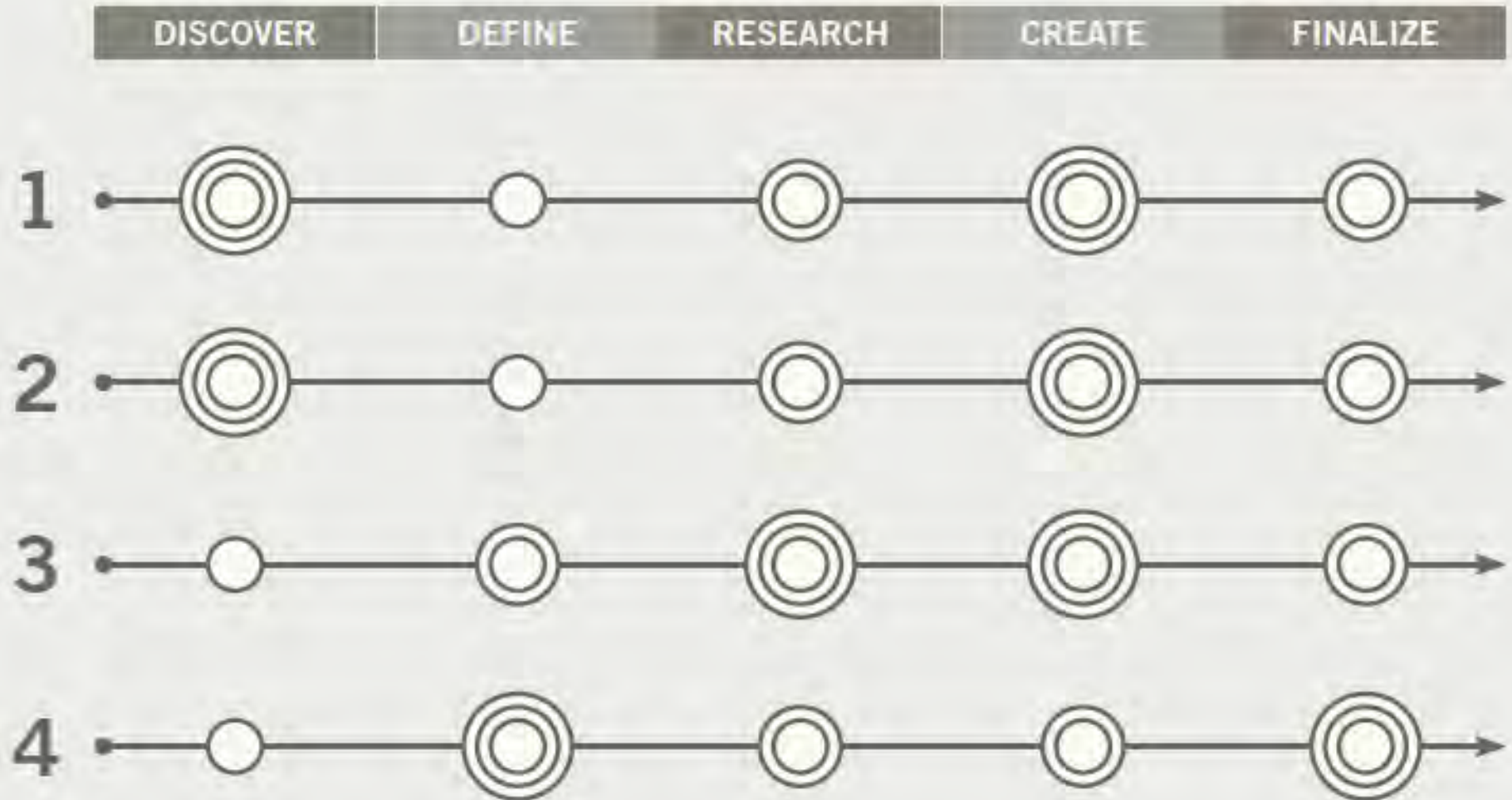
Streams



Streams & courses

	IMAGES	OBJECTS	THOUGHTS	LIBERAL STUDIES	ID CORE STUDIO		EXPANSION STUDIOS
F	F Drawing Color & 3D	F Form & structure	F Experience Design	F	F		
W	W Draw like Leonardo	W	W	W Introduction to visual studies	W Studio 1		
F	F : Representation & communication	F Meaning & language of form	F Think Tank	F : History of Modern design	F Design of Everyday things		
W	W	W materials, tools & technology	W	W : design thinking LS Optional	W Design of Private space	+	
F	F	F Mechanical & structural design	F Conceptual Tools & Techniques	F LS Optional	F Emerging technologies		
W	W Advanced drawing	W	W Thesis preparation	W : LS Optional	W Design for Flow space		
F	F	F	F Context & departure points	F : LS Optional	F Thesis 1		
W	W Advanced presentation	W	W	W LS Optional	W Thesis 2		

Process & Year levels



Scaffolding Themes

PRODUCTS

MATERIALS

TECHNOLOGY

INTERACTIONS

SYSTEMS

1

F

W

2

F

W

3

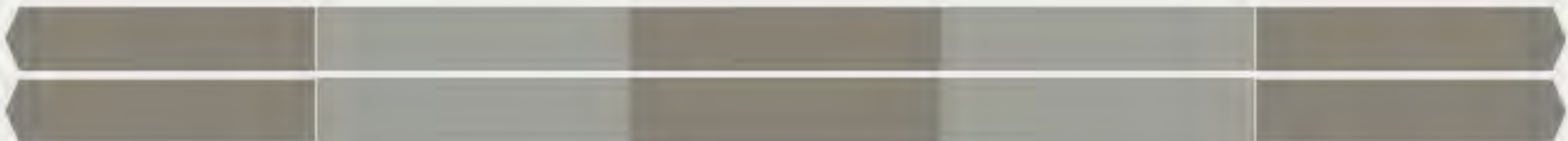
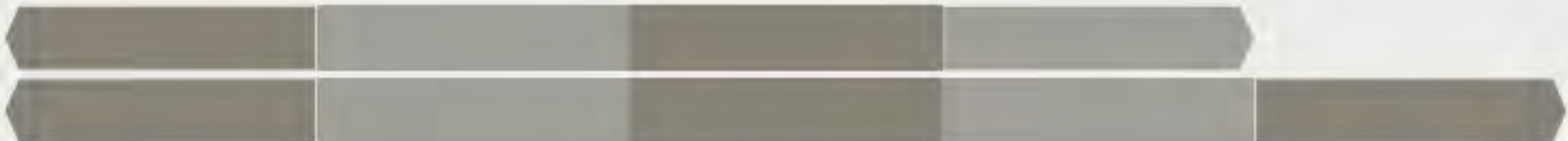
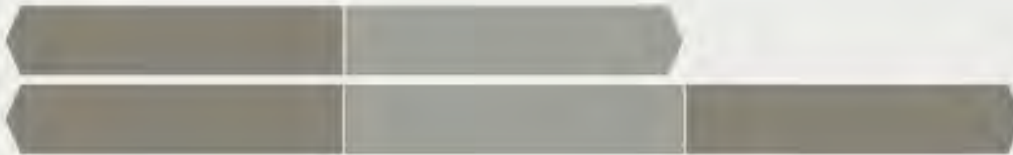
F

W

4

F

W



Think, Do, Feel = Bloom

Thinking, doing and feeling represent the original three domains of learning Bloom identified in the fifties.

THINKING	COGNITIVE DOMAIN
DOING	PSYCHO MOTOR DOMAIN
FEELING	AFFECTIVE DOMAIN

Levels of learning Outcomes

	Intake	Grasp	Use	Create	Mastery
COGNITIVE	Recall	Comprehend	Application	Analysis	Synthesis
PSYCHO MOTOR	Perceive	Manipulate	Precision	Articulate	Naturalize
AFFECTIVE:	Receive	Respond	Value	Organize	Internalize

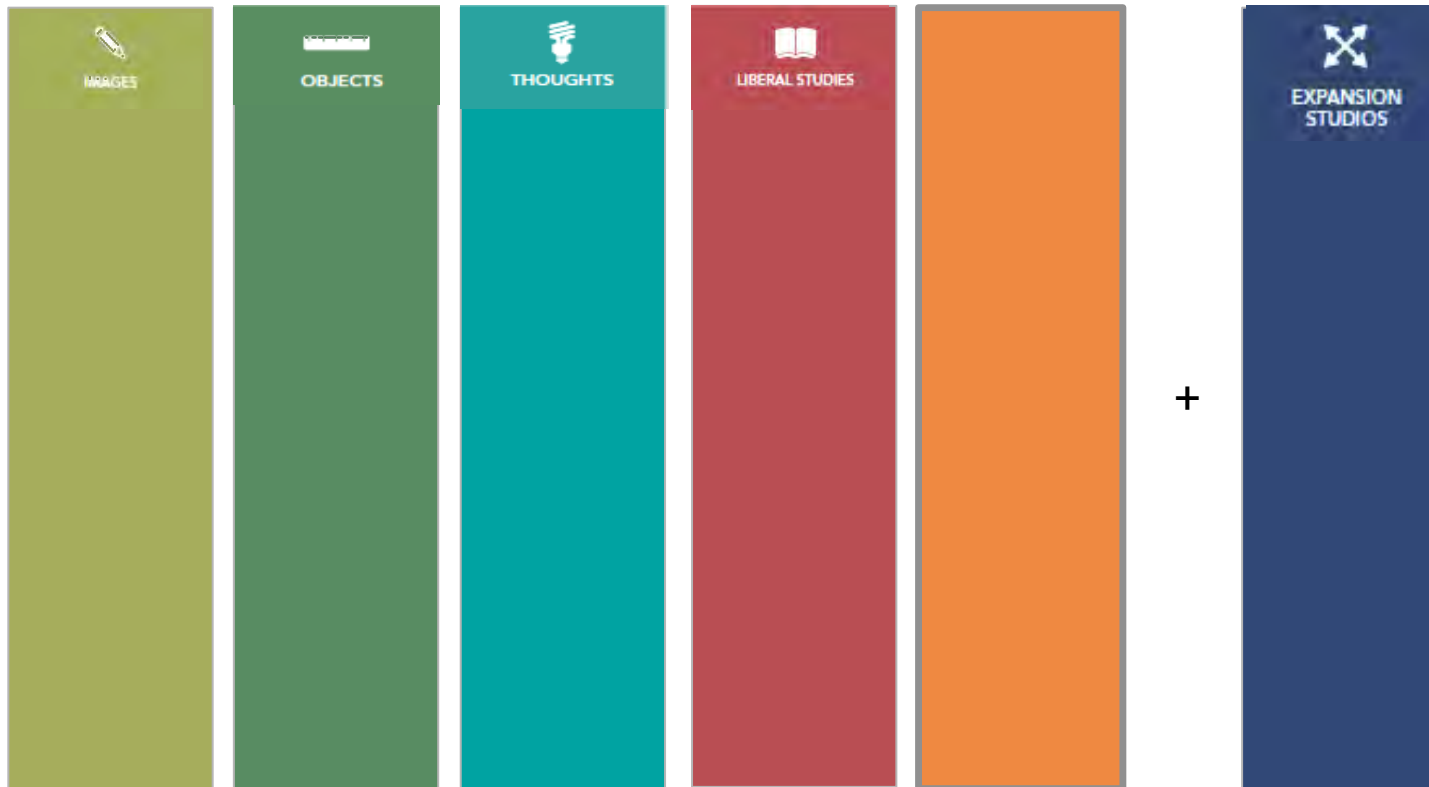
Levels of learning Outcomes

	Intake	Grasp	Use	Create	Mastery
Think	Remember (Students can remember and repeat back what they were told)	Understand (Students can understand what they are being taught.)	Apply (Students can apply their knowledge in new situations)	Analyze (Students competently research, analyze, & utilize learning.)	Synthesize (create) (Students can take learning from many sources and integrate it)
Do	Imitate (Students can copy what the instructor is doing.)	Manipulate (Students can do as long as someone gives them instructions).	Precision (Students can create/do without specific instructions)	Naturalize (Students can design and make what is new based on learning and personal experience)	Originate (Students now design /develop/ create as a master craftsman.
Feel	Receive (Students willing to accept, not necessarily agree with, what they are taught)	Respond (Students value what they being taught enough to react to it)	Value (Students find what they learned important to them)	Organize (Students can restructure their work around what they value.)	Internalize (Students learning is now part of how they define their work)

[illegible]

Case Study

Streams:



Example: Competency & LO

Stream

In 'core' students develop competencies in design process and learn to elicit and integrate requirements from people, technology and business in their projects.

'Core'

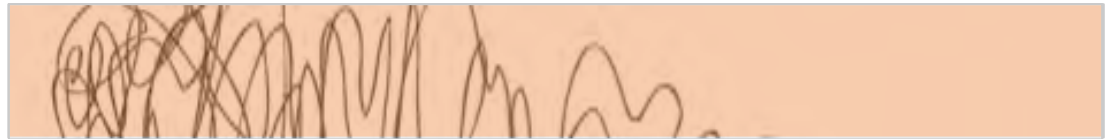


Example: Competency & LO

Core

Competencies

Design Process



People



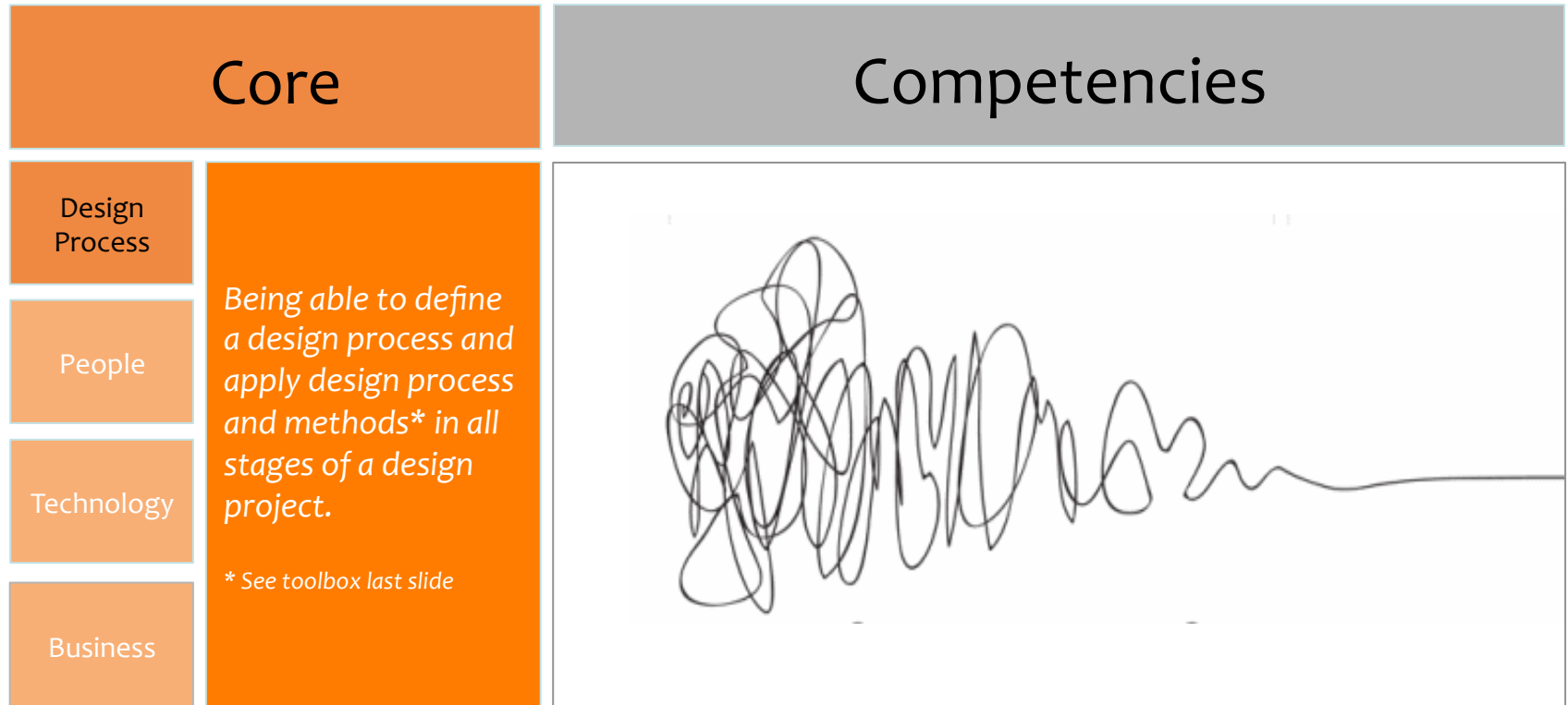
Technology



Business



Example: Competency & LO



Example: Competency & LO

Competency Levels		Intake	Grasp	Use	Create	Mastery
Design Process	Students start to grasp the variety of methods applied in different stages of the design process, with some more depth in discovery and creation methods. Students start to relate their projects to the context* of design.	THINK		Comprehend: Students <i>understand</i> the design process and methods, with more detailed and operational knowledge of discovery (trends analysis & synthesis) and creation methods (ideation and concept development).		
People		DOING		Manipulate: Students are able to <i>apply</i> basic discovery and creation methods in their design projects. Students are able to graphically chart out their design process (in discovery and creation).		
Technology		FEELING		Respond: Students start to value and respond to the importance of methods in the field of creation and feel that these methods enhance personal expression of ideas rather than constrain you.		
Business						

Example: Competency & LO

Core

Design
process

People

Technology

Business

Being able to use qualitative design research methods & synthesis tools and be able to evaluate iteratively design results with end users.

Competencies



Example: Competency & LO

Competency Levels			Intake	Grasp	Use	Create	Mastery
Design process	Within a given project, students can elicit functional and emotional needs of different stakeholder groups by themselves and organize and integrate different requirements in a design brief.	THINK	Analysis: Students are able to analyze user requirements, by using most user research tools* available and organize and prioritize user requirements from different stakeholders points of view.				
People		DOING	Articulation: Students are able to organize, synthesize and communicate different stakeholder requirements in a compelling design brief (within the confines of a given project).				
Technology		FEELING	Organize: Students start to organize their design work and process around the elicitation and validation of user needs in different stages of the design process. They have become deeply empathic, able to think 'through people's eyes.				
Business							

Example: Competency & LO

Core

Design
process

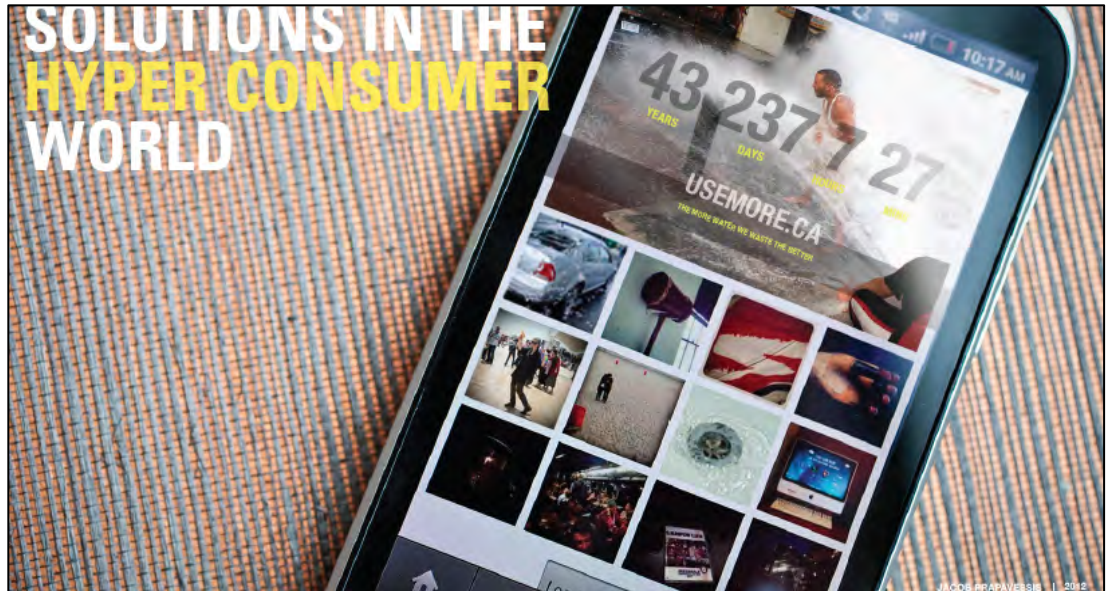
People

Technology

Business

Being able to design interactions for interactive products/services and basic design of interactive products (components, programming, wiring).

Competencies



Example: Competency & LO

Competency Levels			Intake	Grasp	Use	Create	Mastery
Design process	Develop a basic understanding of the technology configuration (components, functions) that reside within products (e.g. in health), while becoming aware of the need for design of interactions.	THINK	Recall: The ability to remember and recall technology configuration principles related to products and remember principles of interaction design.				
People		DOING	Perceive: The ability to replicate some interaction designs with a given technology related product, supervised by an instructor.				
Technology		FEELING	Receive: Being willing to receive instructions and exercises in interaction design and technology configuration.				
Business							

Example: Competency & LO

Core

Design
Process

People

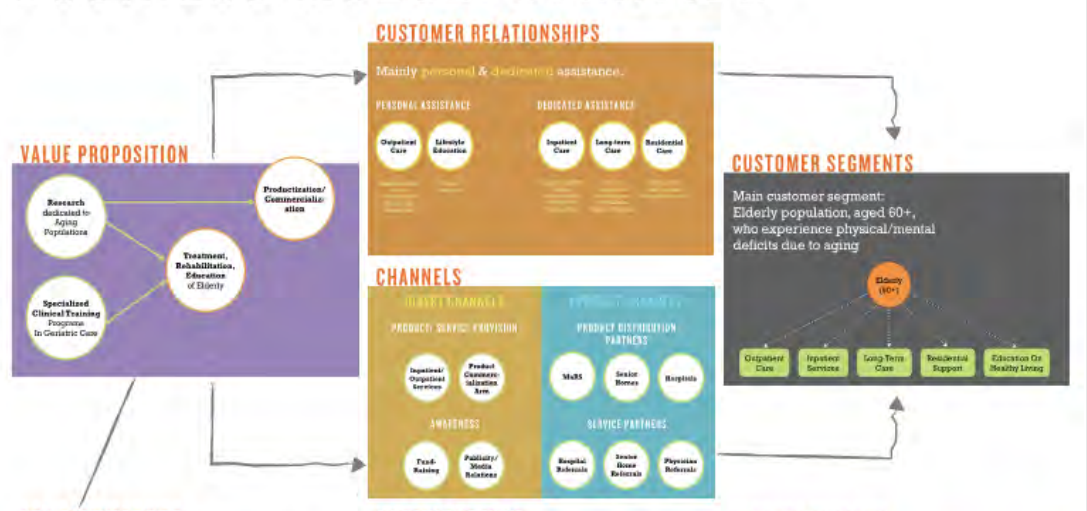
Technology

Business

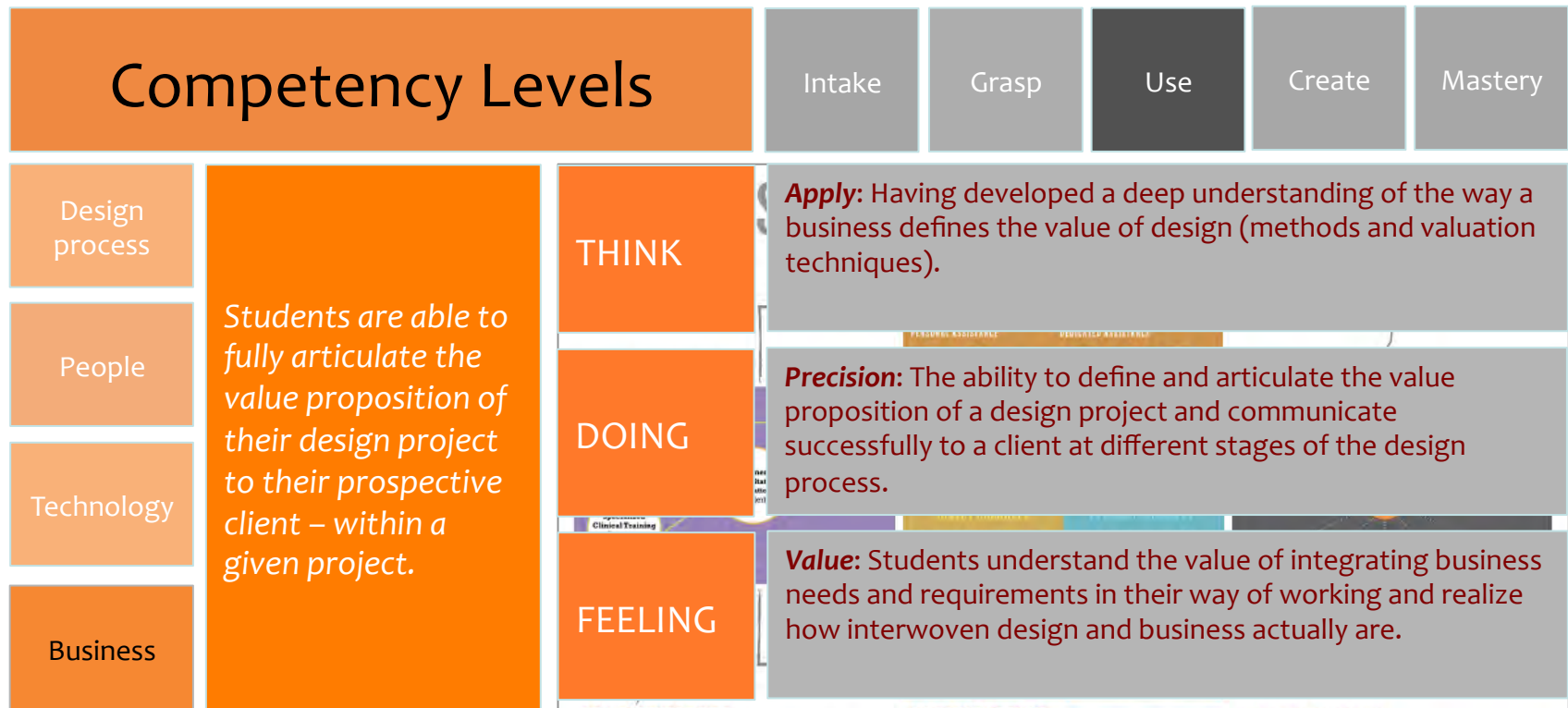
Understand the system of which your product / service is part of. Being able to elicit and integrate business requirements into your design process.

Competencies

BUSINESS MODEL: OVERVIEW



Example: Competency & LO



Planning LO

Studio nr.	Studio 1	Studio 2	Studio 3	Studio 4	Studio 5	Studio 6	Studio 7
<i>Core Competencies & learning outcomes</i>							
Design Process	I + G: Grasp how all design takes place through process. Integrate knowledge and findings from other streams. Discovery & creation methods			U: Start to independently use + integrate people, technology needs.	U: continue to independently use Now also integrate business needs.	Create and use your own process, integrating people, tech and business needs	Master the use of your design process
People needs	I + G Understanding of people's functional & emotional needs			U + C Research & Discovering of people's Unmet needs & desires		M: Co-design with end users in all stages of design process in your project	
Interaction design	I + G product design/ technology			U Tangible Interactions	C: Tangible & digital interactions	M Integrate interaction design principles and methods in all stages of design process	
Business & design				I + G Business 101	U + C Business & value of design	M: Designing with validation of business and estimating value of design opportunity	

Streams + to integrated learning outcomes

Images	Visualization I + G + U + C			Visualization: Mastery
	CAD visualization I+G+U			CAD visualization: Create & Mastery
	Communication & presentation I + G + U			Communication & presentation: Create & Mastery
	Visual thinking I+G+U			Visual thinking: Create & Mastery
Objects	Form language, structure, making I+G+U+C			Form language, structure, making: Mastery
	(analog) Making + manufacturing: I+G+U+C			(analog) Making + manufacturing: I+G+U+C: Mastery
	(Digital) prototyping, Software tools: I+G+U+C			(Digital) prototyping, Software tools: Mastery
	3D Thinking+ I+G+U			3D Thinking: create + Mastery
Thoughts				Creativity Techniques
				Business & Strategic Design
				Design research methods
				TBD

Discussion



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