Developing Hierarchical thinking through sketching

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Background

01 **Prescriptive approaches**

Towards iterative processes of design

02 **Aiming for coherence**

Connecting scenario's with fit-for-purpose proposals

03 **Purpose of representations**

From passive documentation to intentional tool

Philosophy of design

Ontology

How does design thinking look?

Epistemology

What counts as designerly knowledge?

Methodology

How do ways of designing look?

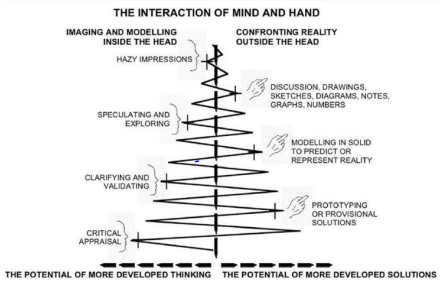
Axiology

What do we value during designing?

The need for pedagogical tools

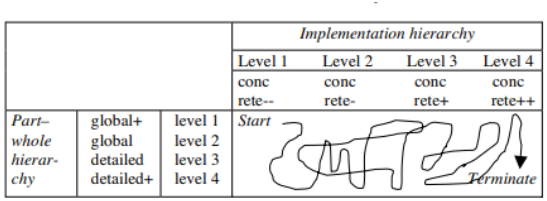
Guiding the process and not thoughts

Developing a framework



Iterative design

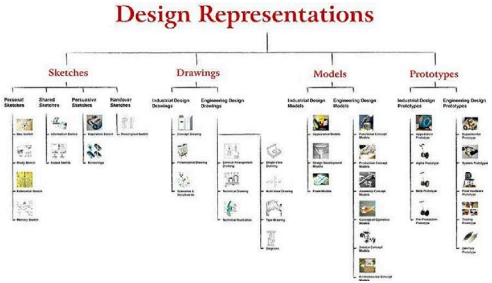
Kimbell et al. (1994)



			Implementation hierarchy			
			Level 1	Level 2	Level 3	Level 4
			conc rete--	conc rete-	conc rete+	conc rete++
Part–whole hierarchy	global+ global detailed detailed+	level 1 level 2 level 3 level 4	*Start*			*Terminate*

Hierarchical thinking

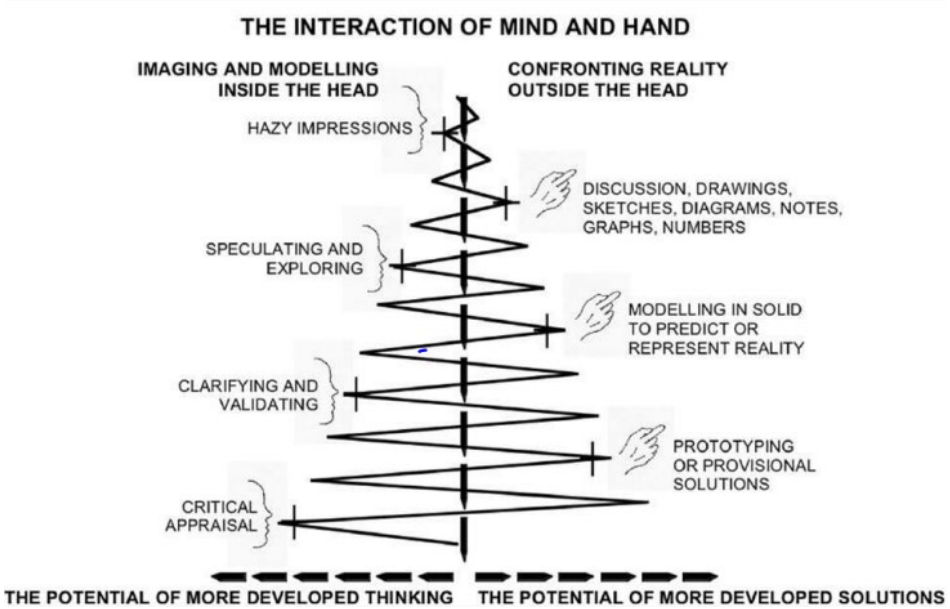
Visser (2006) & Haupt (2018)



Design representations

Pei et al (2022)

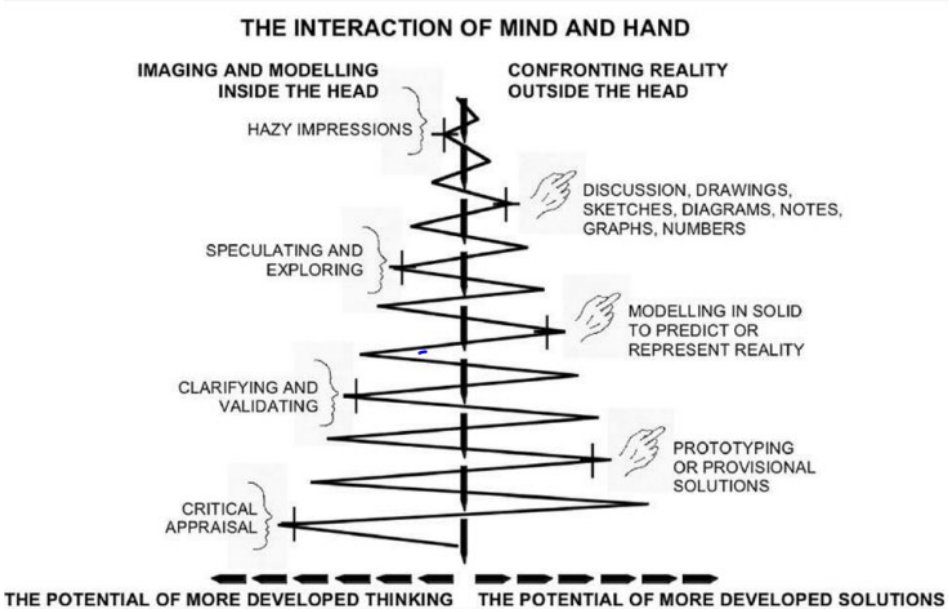
Developing a framework

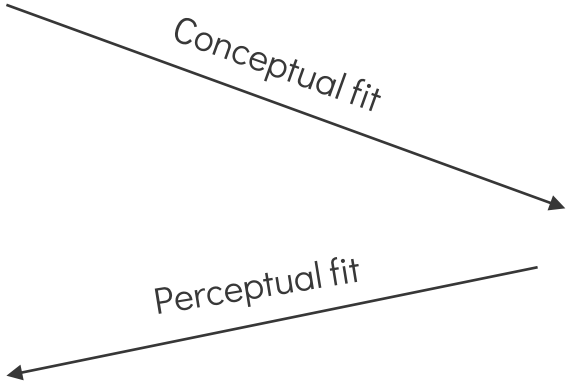


Iterative design

Kimbell et al. (1994)

Developing a framework





Iterative design

Kimbell et al. (1994)

Developing a framework

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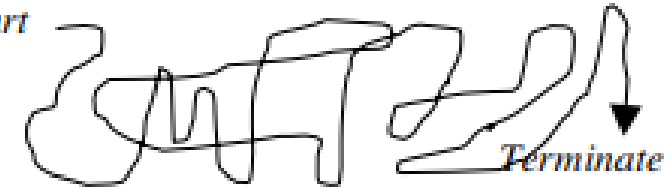
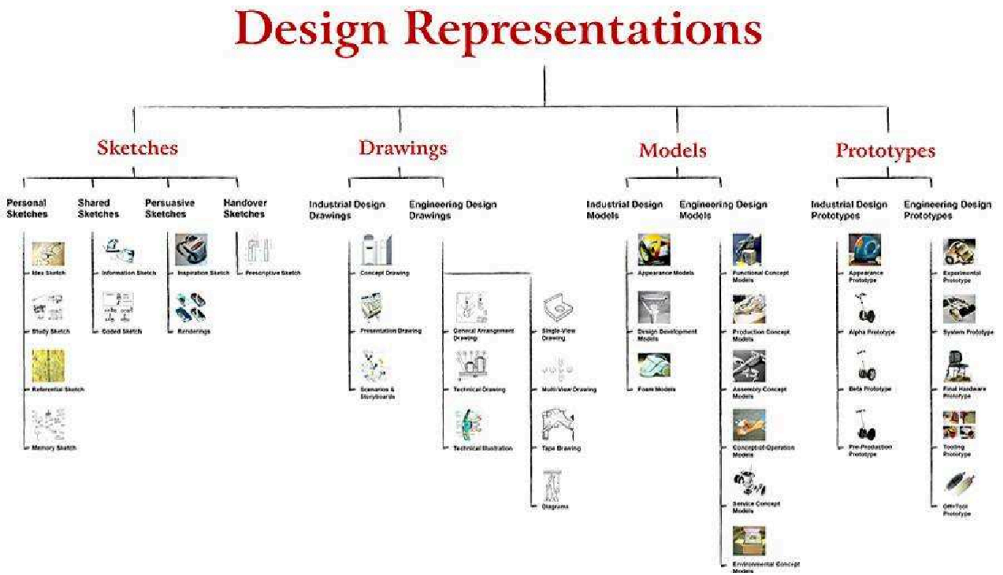
Part–whole hierar-chy	global+ global detailed detailed+	level 1 level 2 level 3 level 4	*Start*  *Terminate*			

Hierarchical thinking

Visser (2006)'s Systematic decomposition approach & Haupt (2018)

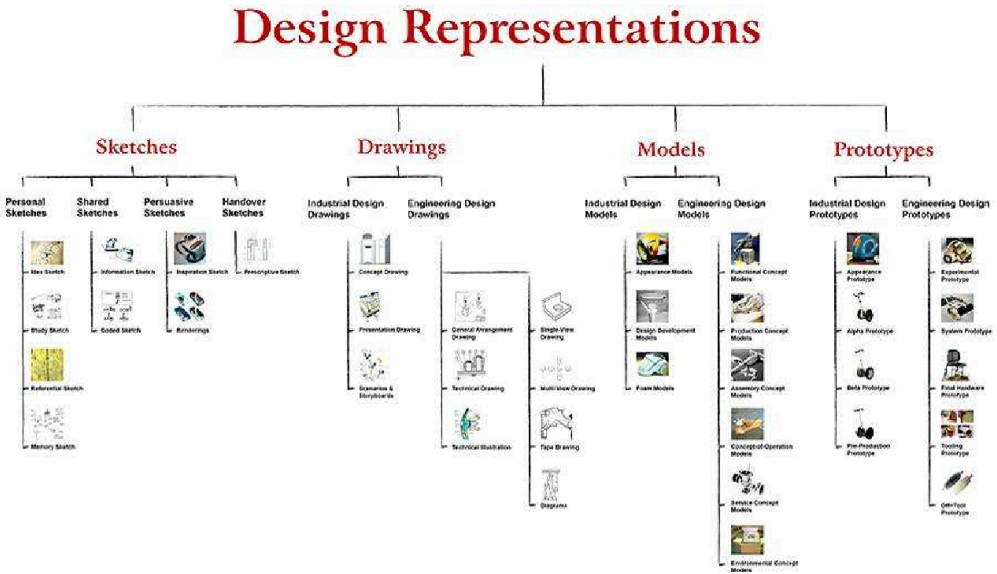
Developing a framework



Taxonomy of Design representations

Pei & Self (2022)

Developing a framework



Taxonomy of Design representations

Pei & Self (2022)

Case study

Pre - service teachers

N=89

Design an assistive device / toy

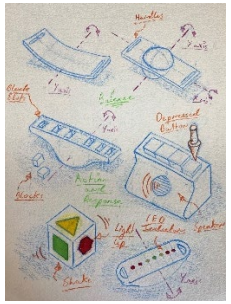
Real life problem solving

Senior cycle Design portfolio

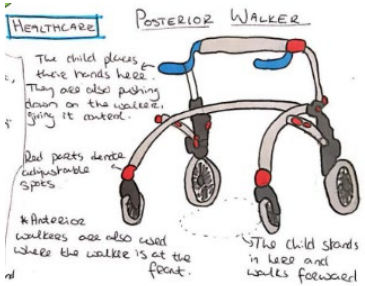
10 Design outputs

Different types of sketches

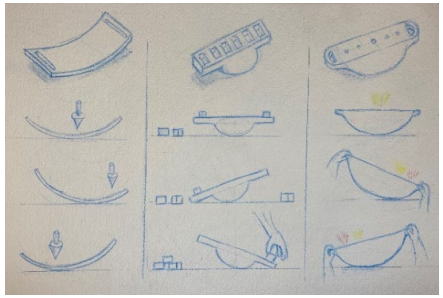
Idea sketches



Memory sketches

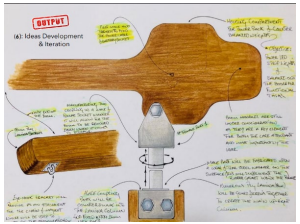


Study sketches



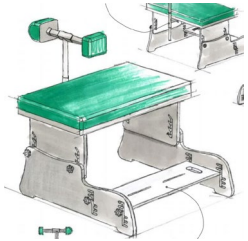
Coded sketches

Information sketches

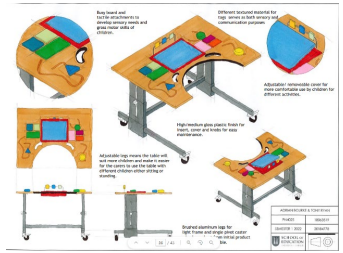


Referential sketches

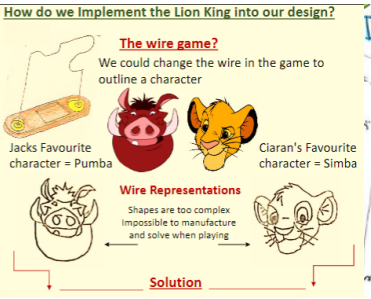
Rendered sketches

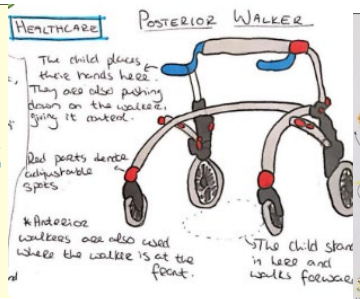


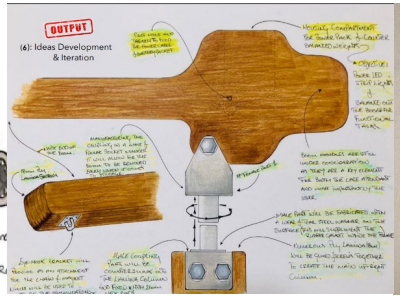
Prescriptive sketches

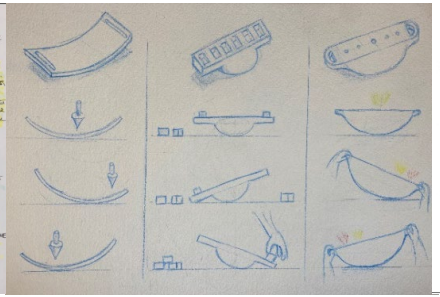


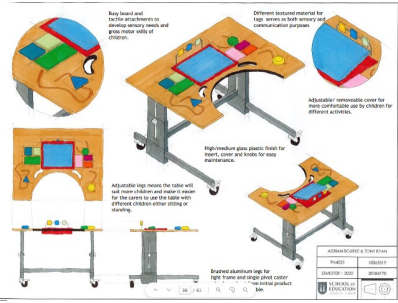
Reflection tool for teachers/Lecturers











Properties

What are the properties and content of the representation?

Part - whole

Identifying if the representation emphasises global or specific

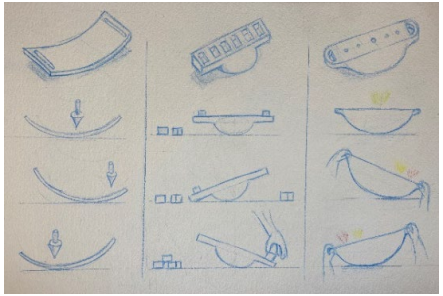
Implementation

Aspectual intentions, functional intentions, physical intentions or implementational intentions

Iterative design

Mental phases: Having ideas, growing ideas, refining ideas

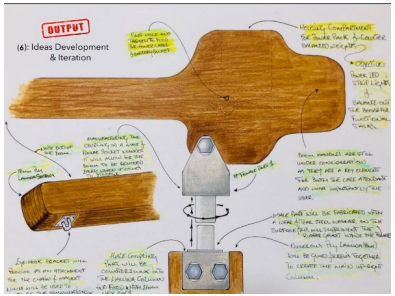
Implementation

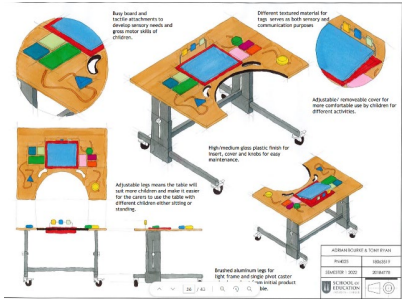


Part-whole

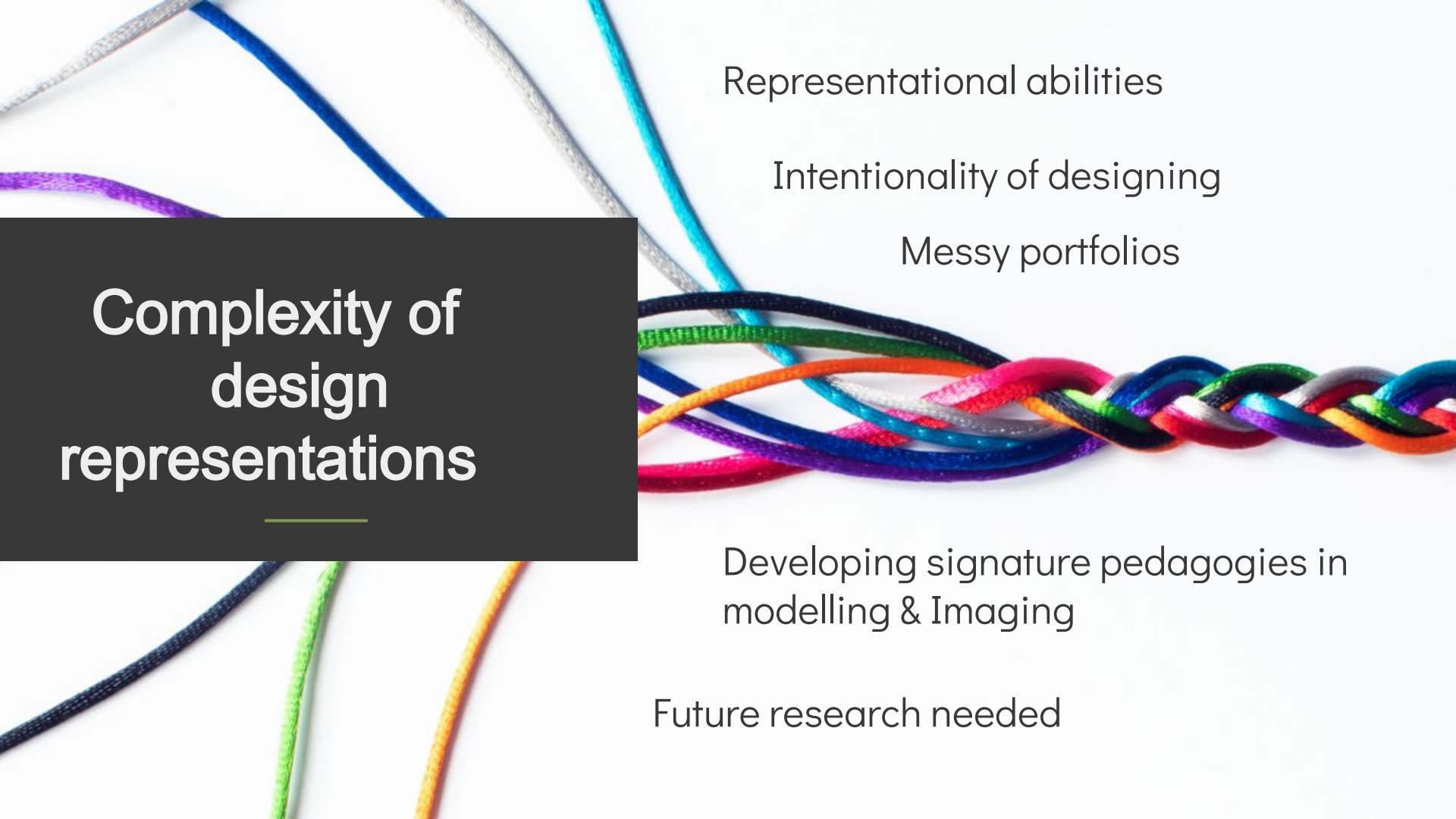
HT matrix

Where in my process am I?





Complexity of design representations



Representational abilities

Intentionality of designing

Messy portfolios

Developing signature pedagogies in modelling & Imaging

Future research needed

Cheers!

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