The Epistemic Role of Artefacts in Creative Design and Knowledge Creation

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Research Context: Design-Based Learning in Higher Education

Collaborative design projects are a core element of current study programs on design and engineering.

Design projects allow students to work on real-world problems and to develop their professional skills and practices.

Nevertheless, design as an opportunity for knowledge creation and object-oriented inquiry has hardly been addressed in current scenarios.
Motivation and Objective

Although the importance of the work with shared artefacts has been stressed both in the context of learning and knowledge creation (e.g. Paavola & Hakkarainen, 2009) as well as collaborative design (e.g. Schmidt & Wagner, 2002; Hendry, 2004), the concept of artefact appears to be under-articulated as it often limits artefacts to mere carriers of information.

Against this background, the aim of this presentation is

(a) To develop a conceptual framework for the description and analysis of the use of artefacts in processes of creative design and knowledge creation.

(b) To illustrate the complex interplay of the material and sign-related properties of artefacts with a given task at hand.
Design Artefacts

Design artefacts encompass all those artefacts created or used in the design process intended to embody and communicate a model of the design space and/or the envisioned design product.

As such they are not the primary object of the design process but are created and used in order to design something.

Design artefacts might include various kinds of drawings, illustrations, models, prototypes, and the like.
Three Perspectives on Knowledge Artefacts

(A) Knowledge artefacts as cognitive tools: external aids for information processing and problem solving.

(B) Knowledge artefacts as shared representations: a common point of reference for the collaborators allowing to exchange but also to probe and contest one another’s ideas.

(C) Knowledge artefacts as epistemic objects: not mere representations of some real world phenomena or idea but evolving objects of inquiry in themselves partly independent of the things they are supposed to represent.
Outline of a Conceptual Framework

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Knowledge Artefact

Activity

Actor(s)

Object of Activity

Outline of a Conceptual Framework
Outline of a Conceptual Framework

Knowledge Artefact

Actor(s)

Activity

Object of Activity

representational qualities
* scope
* level of detail
* level of ambiguity
* foundedness
Outline of a Conceptual Framework

interactional qualities
* accessibility
* malleability
* modality
* persistency

Knowledge Artefact

representational qualities
* scope
* level of detail
* level of ambiguity
* foundedness

Actor(s)

Activity

Object of Activity
Outline of a Conceptual Framework

epistemic functions

- frame
- catalyst
- probe
- experiential substitute
- evaluand
- ...

interactional qualities
- accessibility
- malleability
- modality
- persistency

representational qualities
- scope
- level of detail
- level of ambiguity
- foundedness

Knowledge Artefact

Activity

Actor(s)

Object of Activity

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A Storyboard as a Means for Persuasion or Exploration

The storyboard is of moderate scope and ambiguity and even though the ‘product’ exists, the course of action depicted is fictive.

Due to the format chosen, the storyboard is easily accessible but of limited malleability and restricted to visual perception.
A Rich Picture as a Frame

The rich picture is of limited scope and rather low ambiguity while being founded in observed practices.

Due to the format chosen it is fairly easy to access and modify while being restricted to visual perception.
The design artefact provides a highly malleable but also founded representation of a user‘s experience of using a social network site, supposed to support deeper exploration of the design space.
(Design) Artefacts provide an important means
(a) for scaffolding learning and design processes
(b) for assessing students‘ understanding of the object at stake and the course of action they have taken.

Hence, it is crucial to be conscious about the qualities of the artefacts used and how they play out in relation to different design activities.