The Messiness of Preparing Students for a Messy World

Addressing the 'Wicked' problems of real life that require multiple skills, approaches and knowledges

Challenge: learning the messy business of trying to pull together the materiality and relationships of the real world (Law 2007)

"Learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 38).

Our approach

A three year cycle of design and run of Learning by Developing in a Living Lab in 1 semester courses.

- 3 iterations of *Design for Informatics* MSc course, with graduates in Design and Informatics disciplines (25-35 in class). Stakeholder: *Neighbourhood partnerships*, and *City Waste department*
- 1 iteration of UG course *Data Design and Society (DDS)* – open to any 1st or 2nd year (30 in class) Stakeholder: the University *Food Strategy* team.
  Evaluation by group presentation and individual report.

In a Living Lab

Rather than working behind the closed doors of the studio or lab, students work on messy real life challenges set by professionals in public services, for which conventional education leaves the students largely un-prepared. Students go to the streets for 2 days to gather data and generate design ideas. All ideas are expected to be iterated at least once with citizens and stakeholders.

Learning by Developing

Based on work by Raij, (2006) and Taatila and Raij (2012) , our courses were designed to use an *experiential and iterative learning* process achieved through search and generation of solutions commonly used within Art and Design education. Students are expected to challenge existing practice.

Mixed-discipline groups: Purposeful bringing together of students with different disciplinary backgrounds

Most university education occurs within a disciplinary framework, but most work environments are multi-disciplinary, because this is what real-life problems require. We support students to work within mixed-discipline groups, where they can learn to identify and value their own contribution, and appreciate and respect the perspectives and expertise of others.

Data and Evidence

Students engage with the world though using and creating qualitative, quantitative and machine-sourced 'data' as well as through the search for solutions. The analysis of the data is crucial to the justification and presentation of any potential solutions to the stakeholders: this can be a challenge of design students. This requires rapid training in evidence practices and 'data science' - supported by a set of online tools, and participative methods, a challenge for all.

Impact

Students work with citizens, and confront the local political and economic situation through meetings and in testing: this focuses students on external goals, and the multiple dimensions of action and planning needed to ensure their ideas are communicated and acted upon.

Relational and social awareness

How did we and the students manage?

Based on studies of Innovation: Social Learning

We drew on Activity theory (Engeström 1986), and insights into real-life innovation processes from technology studies (Williams and Edge, Stewart and Williams) that emphasise learning by failure, doing and interacting. In this approach, the meeting of a goal, and achieving closure of a solution or completing a syllabus is second to the learning achieved the process of inquiry and intervention

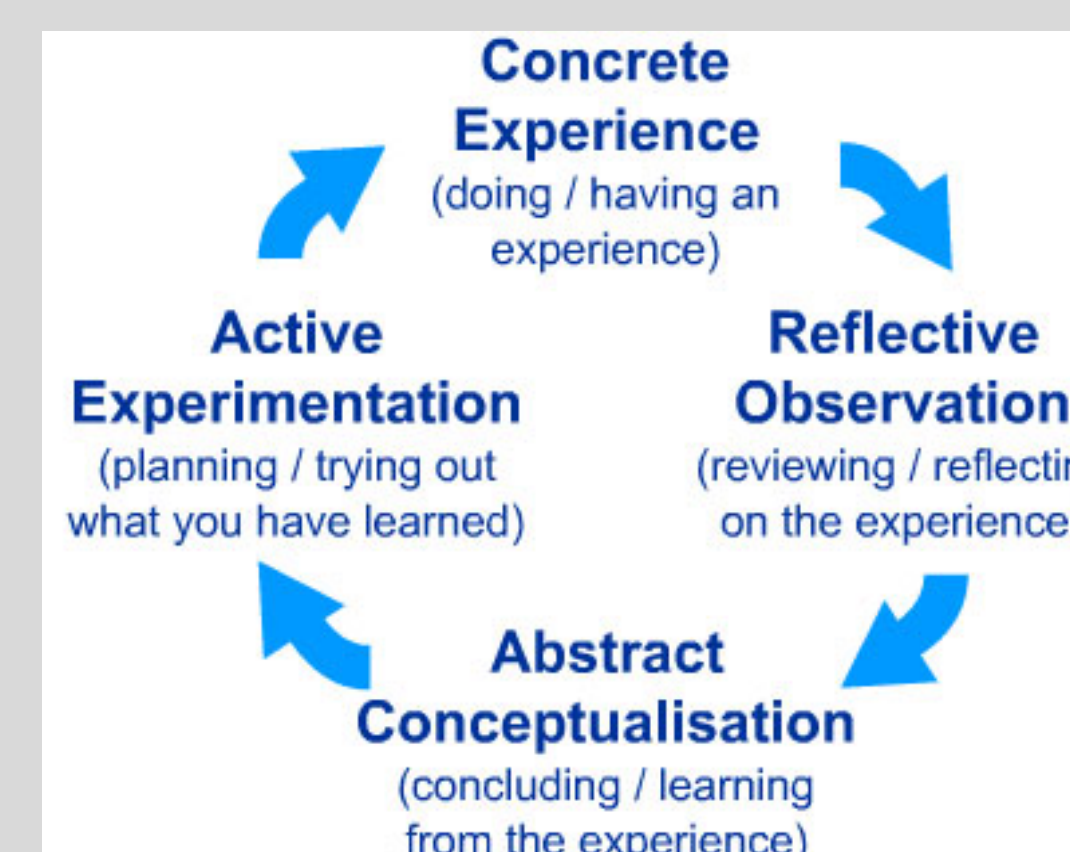Dealing with administrative and space constraints

Cost of mentoring

How much project scaffolding is needed? *A fair bit.*

Cultural Challenges: Can the Chinese students learn to question and communicate?

Too much independence: *"Tell us what we are meant to do?"*

Can the 'Bloom' paradigm students switch to a generative learning approach?

Public Engagement: Self Confidence counts more than educational experience

"We have learnt to listen to each other's ideas and be receptive to different viewpoints"

"Personally, I feel my learning on this course had gone beyond the scope of learning than any other course I have studied so far. In addition to the academic background knowledge and theories of design, I have improved on skills and learned how to conduct and evaluate research."

Data Design and Society Feedback

"Utilising people's individual skillsets is something we have learned as group, as well as working efficiently together on one thing, as supposed to all working individually and just mashing it together."

James Stewart, *Science, Technology and Innovation*; Arno Verhoeven, *Design*, Ewan Klein, *Informatics*
University of Edinburgh

THE UNIVERSITY OF EDINBURGH

The Edinburgh Living Lab

The teaching was developed as part of a broader programme to develop research and innovation in "Living Lab" contexts – in this case, making both the City and the University 'Laboratories' for co-design, investigation and experimentation using co-design, qualitative & quantitative methods, open data, sensors and citizen science. http://edinburghlivinglab.org/

How can we generalise this learning approach?