



# Usable and Affording Physical and Virtual Learning Environments

Niclas Sandström<sup>1</sup>, Robert Eriksson<sup>2</sup>, Kirsti Lonka<sup>1</sup> & Suvi Nenonen<sup>3</sup>

1 University of Helsinki

2 FSR Consulting & BES

3 Aalto University



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This study was funded by **Tekes**  
– the **Finnish Funding Agency**  
**for Innovation** (project 462054)  
and by a grant from the **Finnish**  
**Cultural Foundation.**



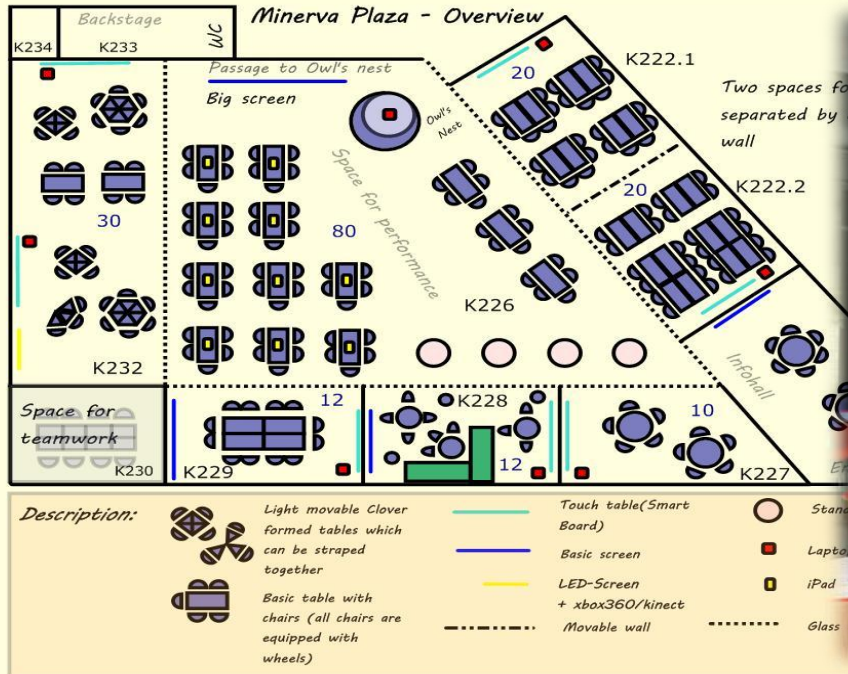
## What did we do – and why?

We wanted to learn how students - in our case, a group of 10 class teacher students majoring in educational psychology - use different learning environments, especially the living lab *Minerva* that was constructed in 2012 as part of the Helsinki Design Capital year.



# A?

## Minerva Plaza living lab





# A?

## Setting the context

[Minerva Plaza time-lapse video](#)

# Competencies

(Säljö (1979), Marton et al; Lonka, Hakkarainen et al.)

Knowledge

Skills

Motivation, emotion

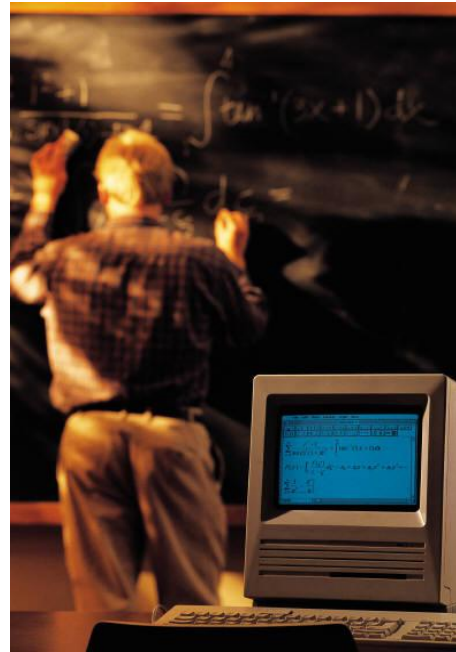
Communicative  
abilities

Ethics

The highest levels?

*Change as a person*

*Collaborative  
knowledge creation*





# A?

## Project work calls for creative collaboration

- **Workplace learning increasingly project-based and socially distributed**
- **Physical spaces and external tools regulate our activities**
- **Our knowledge practices can either hinder or promote our intellectual activities**
  - **so can the physical space!**
- **Knowledge practices are personal, social or institutional routines that are related to knowledge. The combinations of these are often called communities of practice.**





Our aim was to identify the most salient learning-related characteristics of both physical and virtual learning platforms and their affordances.





## We asked

- *how active and social learning processes and knowledge can be supported by the physical, social and virtual environment,*

particularly

- *how the space promotes or hinders the social knowledge practices during an intensive 7-week group work*
- *We focussed on student reports regarding the use and applicability of affordances and reports regarding the usability and functionality of physical learning environments during the study unit*



## Sample and method

The participants were ten (N=10) class teacher students with educational psychology as a major at the University of Helsinki.

The students were in their second year of a five-year Master's program. They were aged between 21 and 35 years; nine were female and one was male.

The observed group follows an inquiry-based curriculum, with emerging social knowledge practices and externally (later, internally) supported group dynamics. They become constructors of knowledge, not just users.



Our approach was qualitative. The interviews, performed in the context of using embedded learning environments, were an appropriate way to gather data from user experience.



The students designed, implemented, and evaluated in iterative reflective cycles a study unit that they collaboratively named “Innovation in the City”. They adopted a multidisciplinary perspective, integrating the disciplines of Geography and Crafts.



Before the collection of data for this study, the students filled in an informed consent form giving permission to use all the material that they produced for research purposes.

These data included the recordings, observations, interviews, questionnaires including questions about situational academic emotions and interest, and their own material that they produced during the whole study unit.



## Results

The value added characteristics emerging from the **shared use of interactive participatory methods** (especially Flinga®) were stressed in relation to the use of space as well as in terms of how the physical space and its affordances were experienced.

One student reported the **beneficial anonymous aspect** about using Flinga, although she also referred to the "pseudo-innovativeness" of such technology:

*"I have a love-hate relationship with Flinga because I'm still not quite sure whether it's something really new, because people have always like written things down together and brainstormed whether it was on a post-it or on a chalk board... that it's not new as an idea... but still I've got to give in for Flinga just a bit because... it's like it enables a sort of more fluent brainstorming, and that way a more productive brainstorming session as it's so easy".*



## Results (2)

**The mobility and experienced timelessness and placelessness of using mobile devices**, like the tablet computer, became an empowering experience for most students. One of them recalled:

*At first, I thought they were of little use for us... that it took its time to become accustomed to using it and to find one's own routines in using it. And now that I've found the routines and become familiar with the tablet and know how to apply it, now I'm at point where I wonder how I ever managed without it. That it's the finest thing about it that it doesn't tie you to a certain time and place, but as it's a small thing to carry with you, it's always with you right there and it like helps tremendously in a student's mundane life...*



## Results (3)

**The easiness of use** of the technological tools that are being tested in the living lab gained much positive attention

- More efficient brainstorming
- Quickness, spontaneity
- More “equal” opportunities to participate and co-create

*“The technological applications here they are like... they make things easier. Like Flinga, it's just like... it's like a time-saving way to go through the brainstorming sessions that would normally take lots of time and energy.”*





## Results (4)

**The flexibility of the space** was stressed in many responses in the final interviews. The technological pedagogical intertwining of new tools with the physical space was explicitly present in most respondents' reports.

→ But: Flinga is presently available in only some spaces

A positive feature of the Minerva living lab reported by the students is its **true flexibility** as to for instance furniture. When performing collaborative group tasks, the students might change the position of chairs and tables as they wished.



## Results (5)

In addition, many students feel that tables between people - at least if not movable - hinder co-creation and reciprocal communication. When asked about experiences of different physical spaces during the study unit, one student reported:

*Well I've got to admit that for the most part, I don't understand why people sit with a table in between them. [---] Like in a way, when we think about school world, then they are like... the spaces don't support knowledge building and interaction.*



## Results (6)

Another student reported the same when asked about the tables. The **effortless movability** of the tables in the living lab was seen as something truly positive, although the existence of tables in the spaces was found to have an affinity in people:

**But these tables like invite one to sit around them as one's always done before.** [---] *Well like at times it feels like the table isn't a good thing. That at times we've like been here sitting in a circle when reflecting more on something, like something that requires more thinking effort that everyone doesn't have to write down on the tablet or read something, that it's been quite refreshing just to concentrate together on the idea.*



## Results (7)

Another student pointed out the fact that they actually felt **attachment and agency in the living laboratory** due to the flexibility of the space and the movability of the tables and furniture.

*Over there in the smaller room the tables there are nice, they are smart and at times we have done so that we have sat on the floor and then people have stared at us from the plaza (laugh)... I really like the big glass walls.*



# A?

**Discussion and practical implications  
(to be addressed during the panel  
discussion)**

**Thank you!**