



Seamless Learning Technology

PROF. DR. MARCUS SPECHT
WELTEN INSTITUTE
RESEARCH CENTRE FOR LEARNING, TEACHING AND TECHNOLOGY
OPEN UNIVERSITEIT NEDERLAND
MARCUS.SPECHT@OU.NL
TWITTER, FLICKR, FACEBOOK: MARCUSPECHT



#0 DESIGNING TECHNOLOGY
ENHANCEMENT DRIVEN BY ...

NEW DIGITAL CONTENT

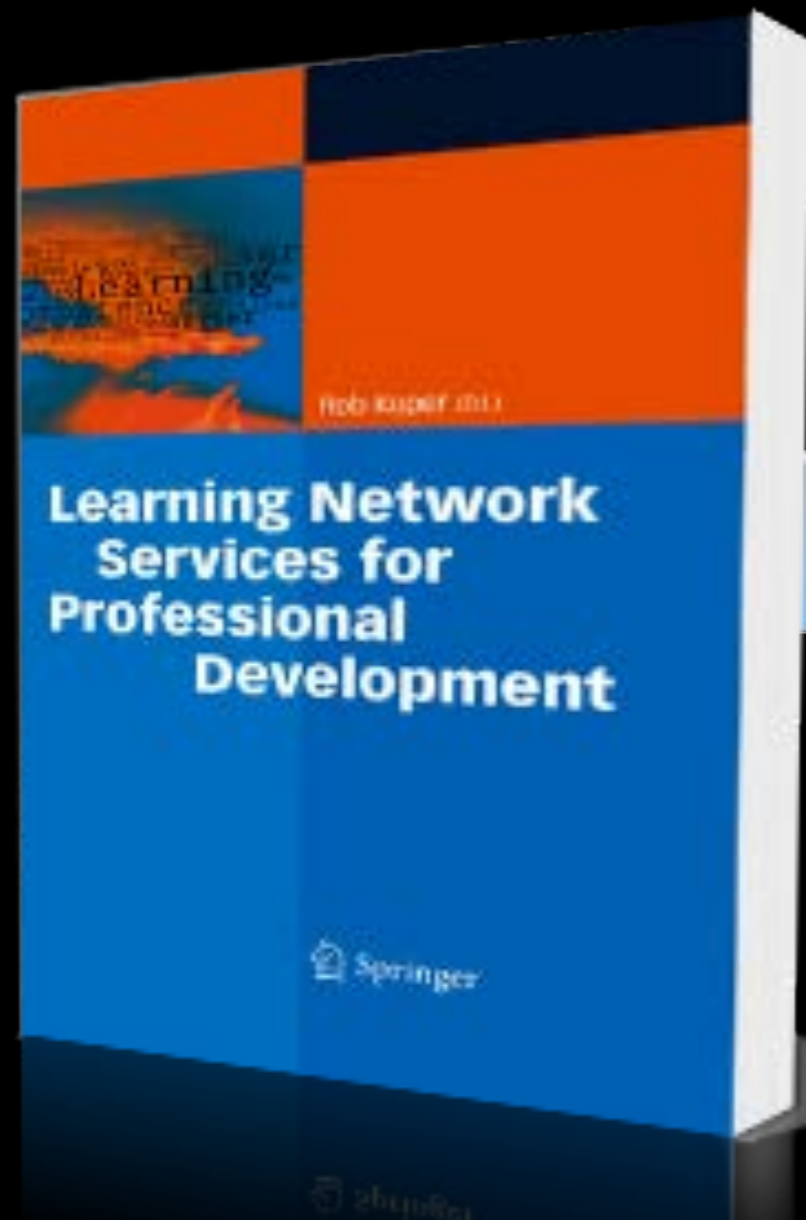


OER, iTunes U, Youtube EDU, ...

LOR: GLOBE, Ariadne, ODS, MACE, Sharetec,...

Mobile: GLOBE, Ariadne, ODS, MACE, Sharetec,...

Scaling Processes



Section I Social Interaction in Learning Networks

Section II Navigation Services

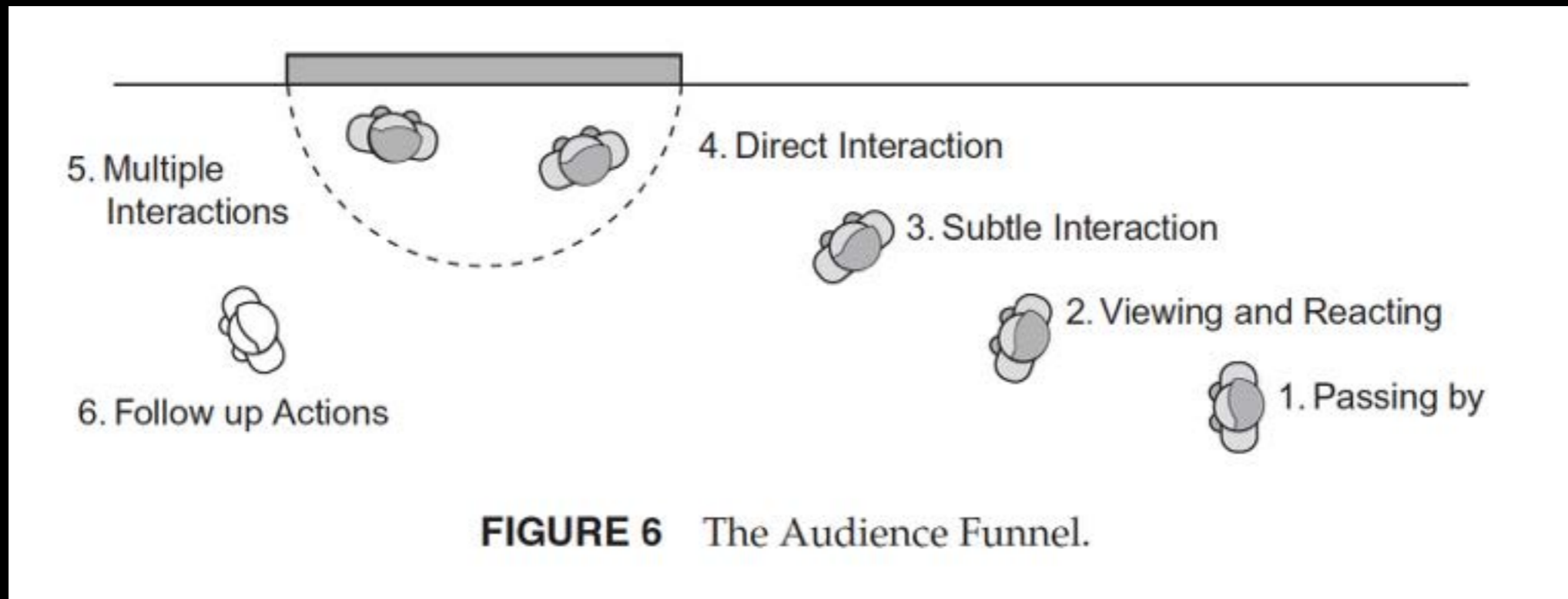
Section III Assessment and Placement Services

Section IV Contextualized Learning Network Services

Section V Learning Networks Integration

MOOC: Coursera, edX, OpenLearn,
Futurlearn, yOUlearn

NEW INTERFACES



Mobile Access, Augmented Reality

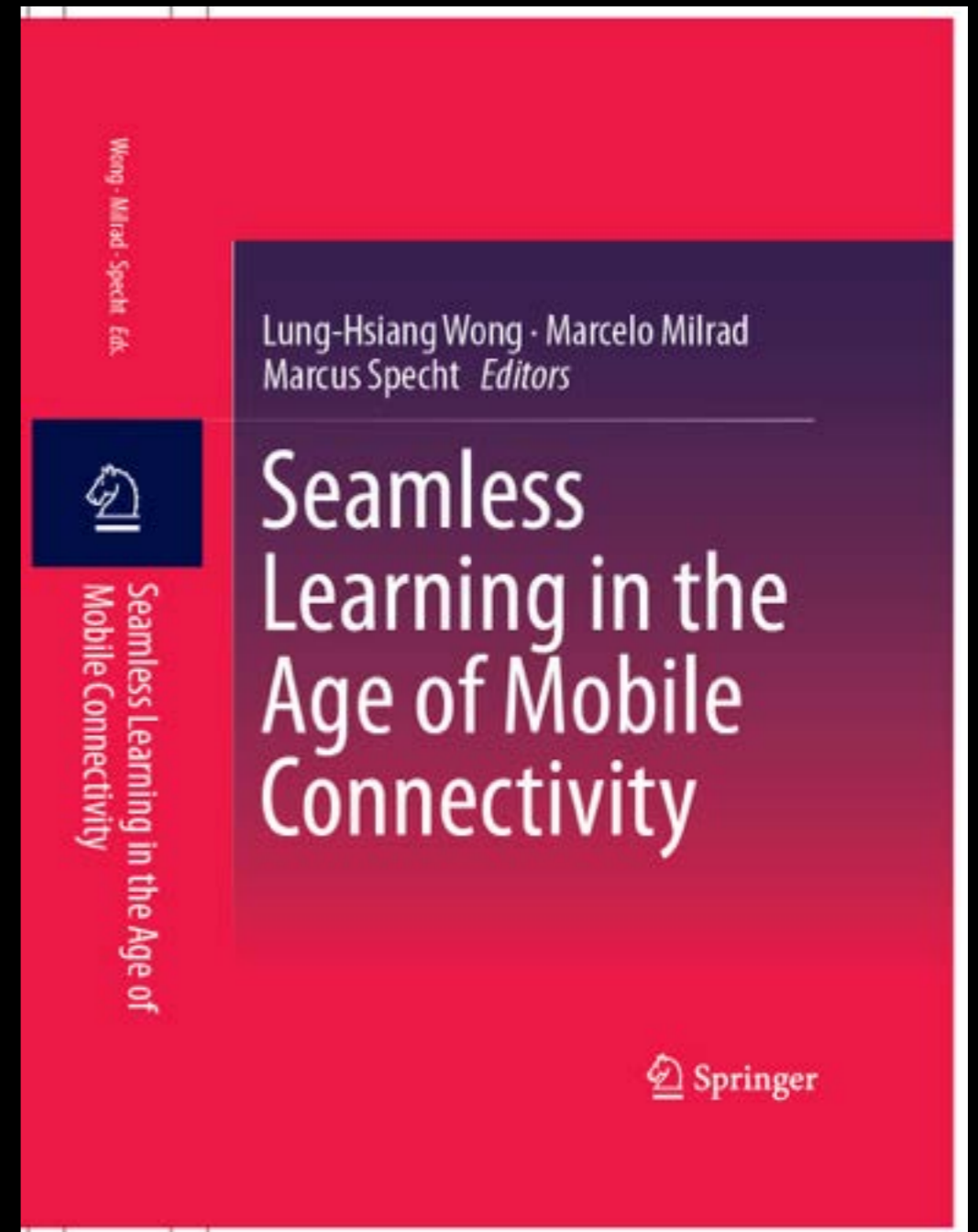
Tangibles, Sensor-Based Interfaces, Tabletops

Situated Displays, Ambient Displays, Public Displays

RESEARCH AND DESIGN CHALLENGE:

HOW TO DESIGN SEAMLESS LEARNING SUPPORT IN TEL SPACES?

- Formal and informal learning;
- Personalized and social learning;
- Across time; locations, social contexts
- Combined use of multiple device types;
- Physical and digital worlds
- Multiple learning tasks knowledge synthesis



HOW TO CREATE LINKS BETWEEN DIGITAL AND PHYSICAL

#1 LINKING THE WORLDS



Participants

Name	Role
Mo	Scout
Marcus	Data Gatherer
Lucia	Annotator
Nick	Researcher
Milos	Analyst
Alex	Reporter

Task Overview

Task	Subtasks	Status	Participants	Repository
Flower Task	• Collect pictures of at least 10 different flowers you can find on the meadows.	<div style="width: 100%; height: 10px; background-color: green;"></div> finished	Mo (Scout) Marcus (Data Gatherer) Lucia (Annotator)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	• Find out at which places they preferably grow and check if that matches your findings.	<div style="width: 66%; height: 10px; background-color: orange;"></div> ongoing	Nick (Researcher) Milos (Analyst)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	• Ask the expert which of the flowers is the rarest and which he likes best.	<div style="width: 33%; height: 10px; background-color: yellow;"></div> pending	Alex (Reporter) Sian (Comm. Manager)	
		<input type="button" value="Add Subtask"/>	<input type="button" value="Change"/>	<input type="button" value="Add / Remove"/>

Communication

from	subject	time
Lucia	A new task for you!	11:35
Nick	Can you please...	11:27
Marcus	Question concerning task 1	11:22
Mo	Hello	11:21
Roderick	What shall we do next?	11:17

Tree Task	• Collect pictures of at least 10 different flowers you can find on the meadows.	<div style="width: 66%; height: 10px; background-color: orange;"></div> ongoing	Mo (Scout) Marcus (Data Gatherer) Lucia (Annotator)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	• Find out at which places they preferably grow and check if that matches your findings.	<div style="width: 66%; height: 10px; background-color: orange;"></div> ongoing	Nick (Researcher) Milos (Analyst)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Mo | Hello | 11:21

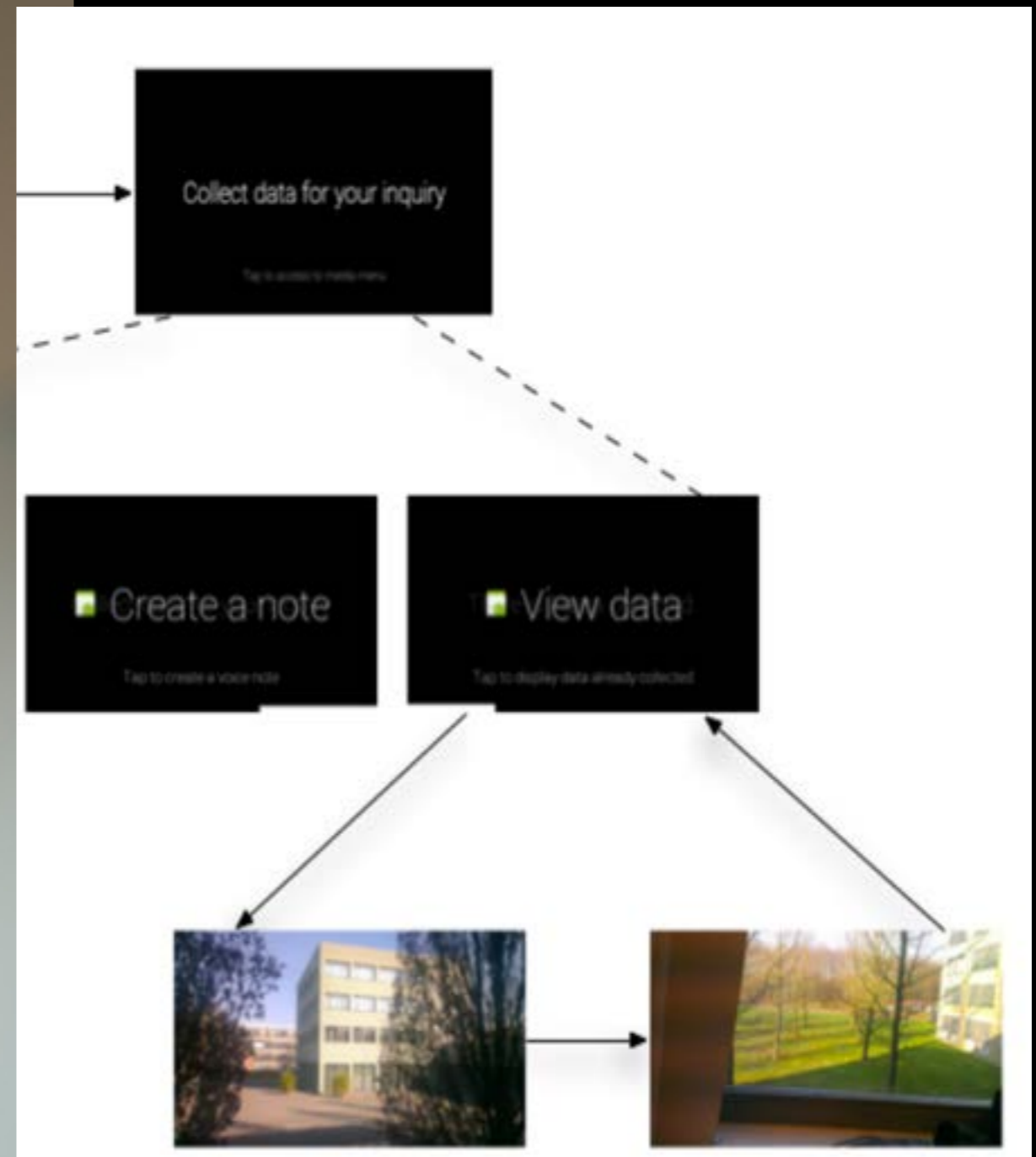
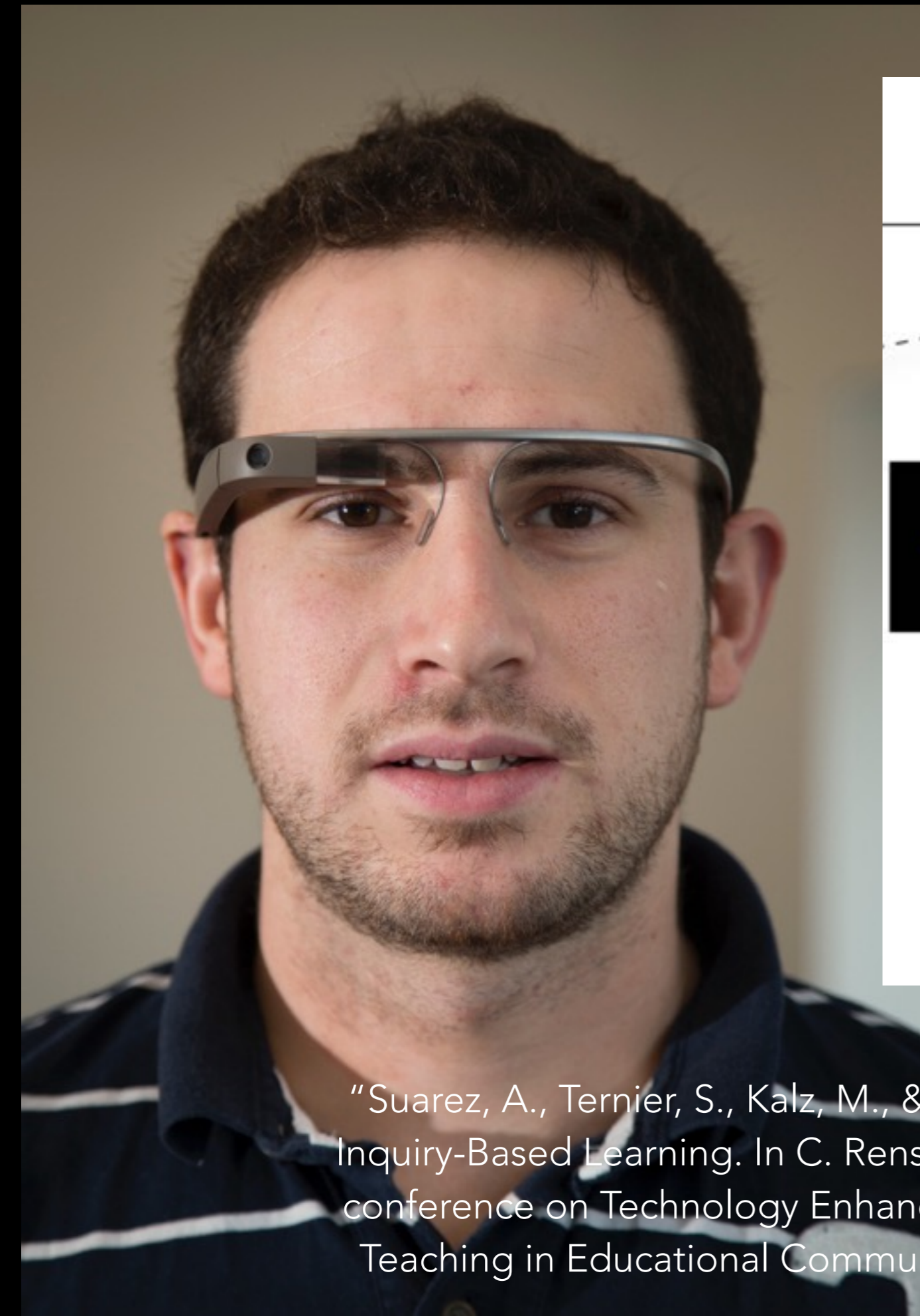
Hi, here you are some more flower pictures.
Just tell me if you need more or different ones...

Navigation

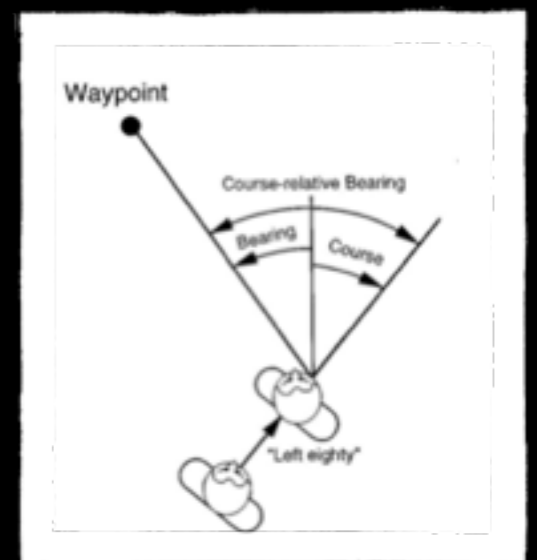
Comment:

Here are a a lot of different flower different flowers and old trees.

**FIELD TRIPS
LOCATION-BASED**



"Suarez, A., Ternier, S., Kalz, M., & Specht, M. (2014). GPIM: Google Glassware for Inquiry-Based Learning. In C. Rensing et al (Eds.), Proceedings of the 9th European conference on Technology Enhanced Learning - EC-TEL 2014: Open Learning and Teaching in Educational Communities, LNCS 8719 (pp. 530-533). Graz, Austria.."



audio augmented spaces ...

OPENSOURCE FRAMEWORK FOR MIXED REALITY GAMES

ARLEARN



LANGUAGE LEARNING

- <http://www.elena-learning.eu>



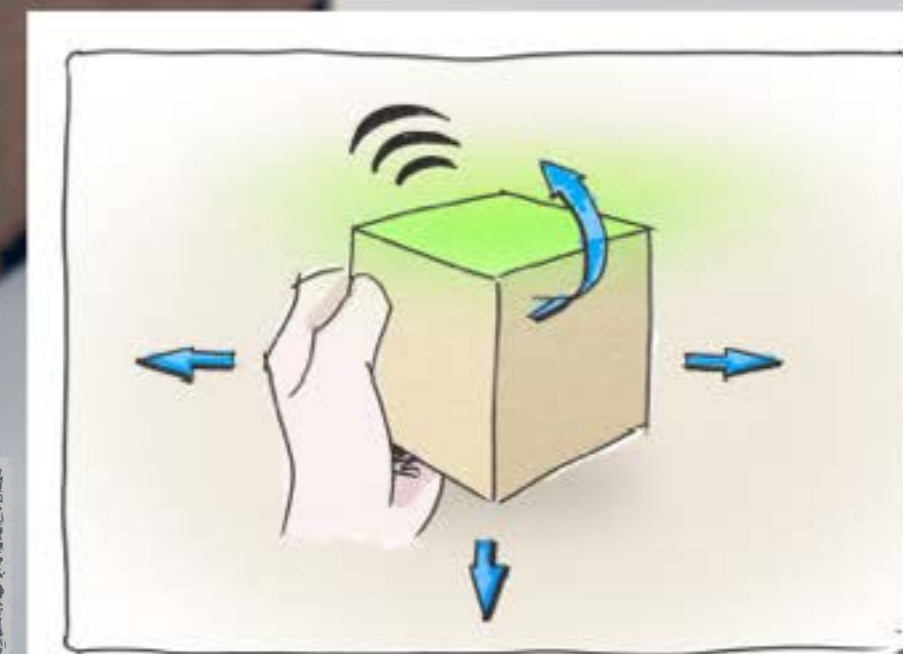
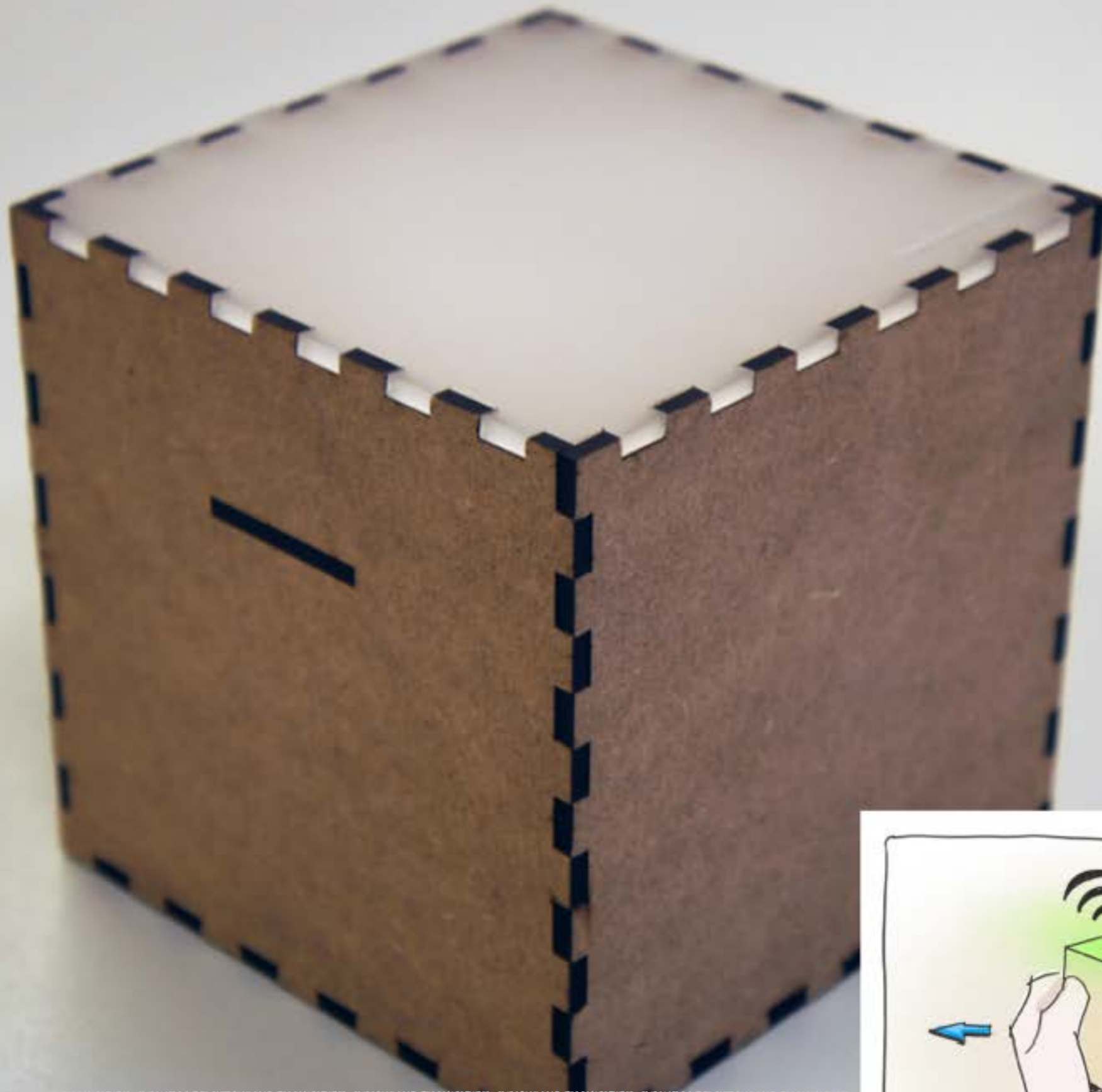


mæve

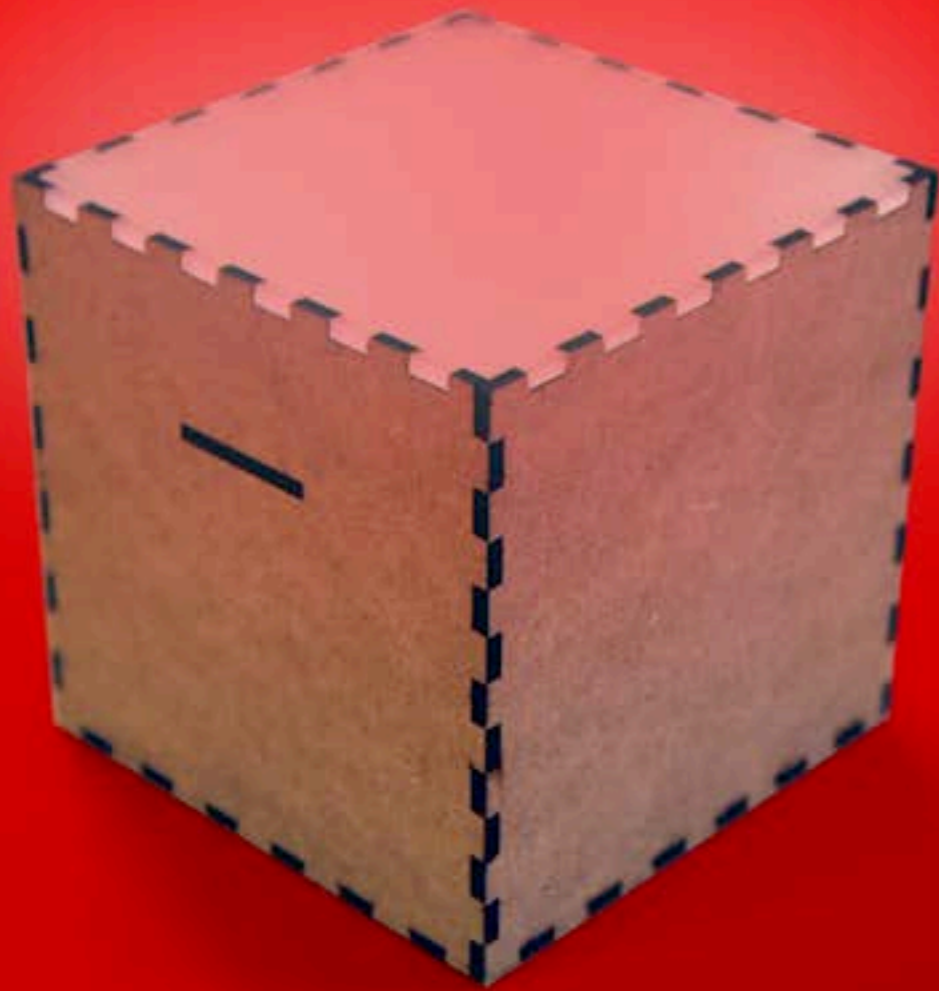
MACE | EVERYVILLE

interactive installation at the Venice Biennale '08

objects as controllers of ambient displays ...



actuator/controller ...



Feedback Cube

A tangible interactive
ambient display
to support
learning scenarios



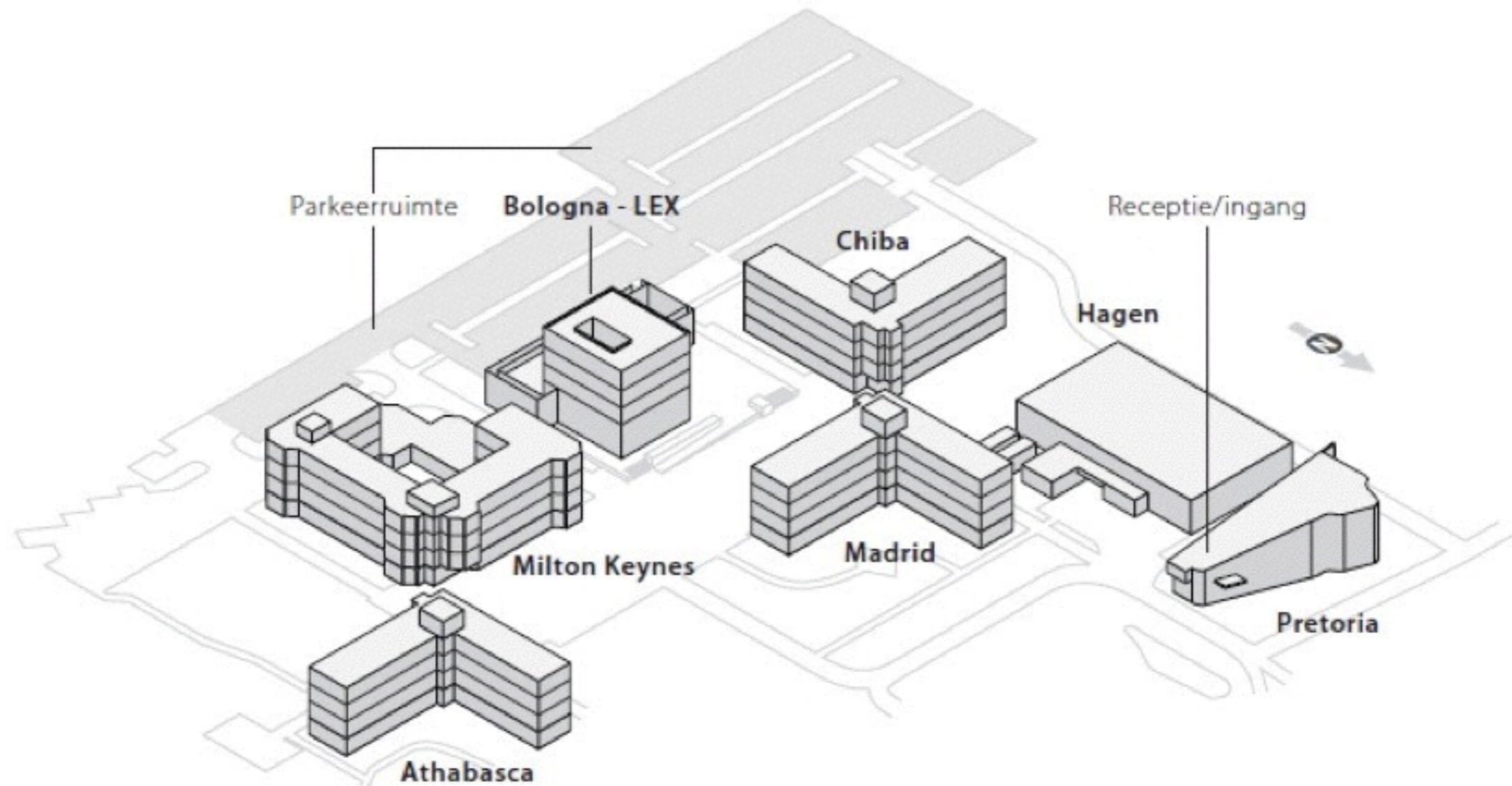
[HTTPS://WWW.YOUTUBE.COM/WATCH?V=RL-JAI14IN8](https://www.youtube.com/watch?v=RL-JAI14IN8)

embedded trackers ...

#2 LINKING TO HUMAN LEARNING

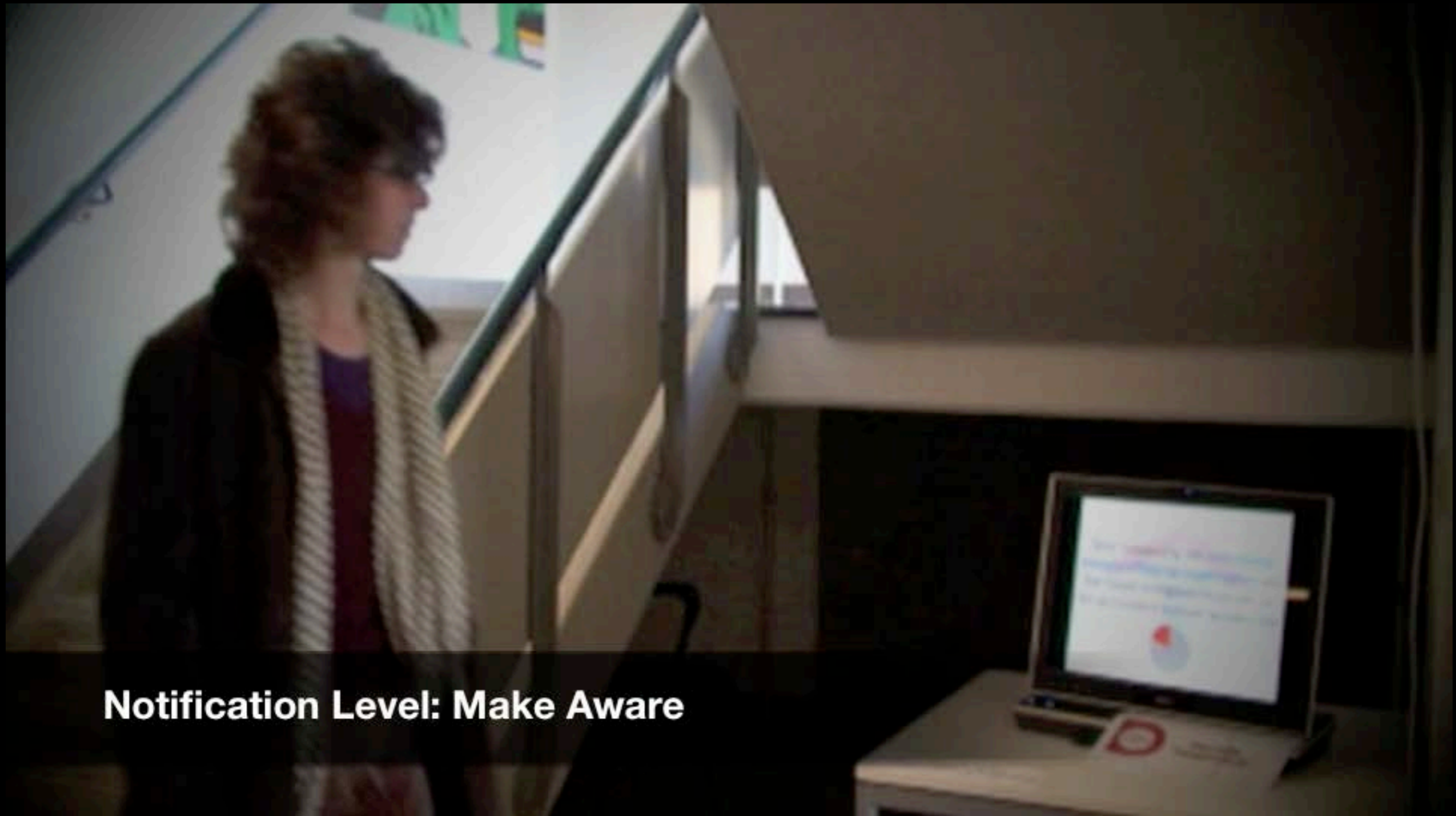
#2A AWARENESS

Conception



measuring power consumption on campus with standard facility management, plus sensors on workplaces and public devices, personal registration of power consuming activities.

Energy consumption ...



Notification Level: Make Aware

Information

Action

Challenge

Welcome

Second Floor

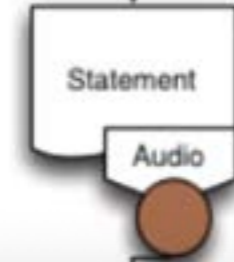
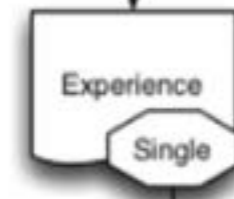
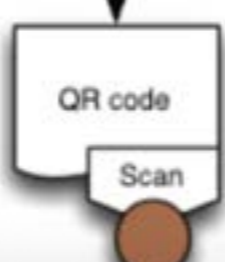
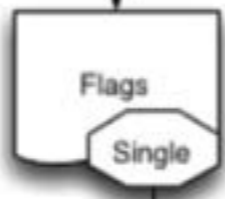
142 occupants

7,764

Kilowatt-hours

26%

PERFORMANCE NOW



[Action] QR code

Great you found the Mindergie flags. The first thing you have to do here is to find the small QR code attached to the 'Athabasca' flag pole.

When you found it, simply press the scan icon below and use your camera to scan the code.



image #

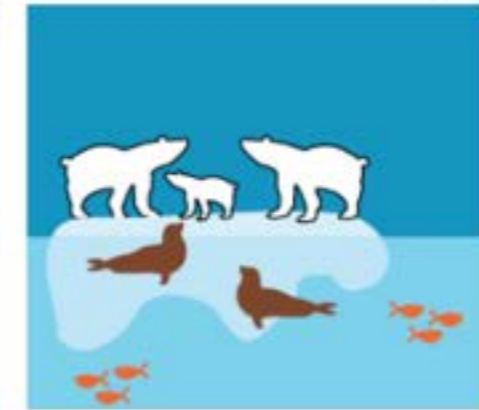
1

3

12

21

last



MAIN RESULTS ENERGY AWARENESS

- Situated displays have a generic effect of raising awareness and energy consumption on a mid to long term
- Badge and social incentive systems must be embedded with social media to have an effect
- Real world action foster curiosity, discussion, and reflection about the topic when combined with public displays

HUMANS DO NOT ALWAYS LIKE TO DO ...

#2B REFLECTION IN AND ABOUT ACTION



Inquiries > Healthy food open inquiry

Healthy food open inquiry

More info

Leave inquiry Export inquiry

Share Email Print

Healthy food open inquiry

Open membership



- Badges
- Domain Structure
- Inquiry activity
- Inquiry help
- Learning Analytics Dashboard
- Quizzes

I wonder ...

0 vote
0 Answer

Amount of calories
Is there a correlation between the time at which a meal is taken and the amount of calories that is consumed.
By Stefaan Ternier 58 days ago

Pre-knowledge resources

What types of research questions are there?
By Fleur Prins 55 days ago Comments (1)



weSPOT Inquiry Tool

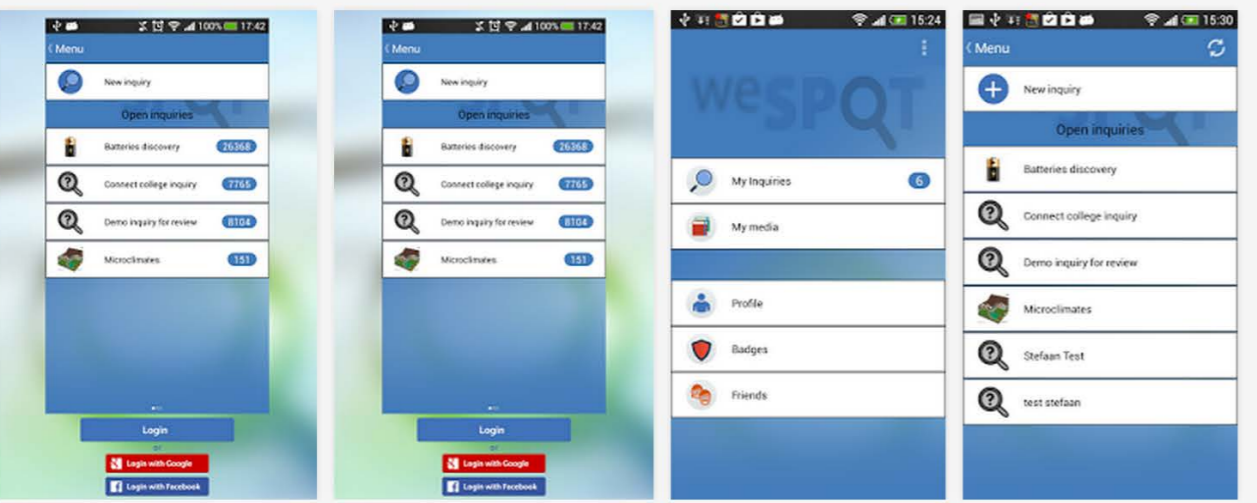
Stefaan Ternier, Welten Institute - 6 november 2014
Onderwijs

Geïnstalleerd

Deze app is compatibel met een aantal van uw apparaten.

★★★★☆ (4)

+3 onder wie Bernardo



weSPOT inquiry

Home Inquiries Members Activity Help

General inquiry atheneum
Healthy food open inquiry
Heraklion Test Group Bulgaria
Life on Earth

Alexander Mikroyannidis
Angel Suarez Fernandez
Fleur Prinsen
John Hendriks

Star rating none - 5

Name	Prob.	Oper.	Dat. Col.	Dat. Ana.	Inter.	Comm.
Alexander M <small>[Healthy food open]</small>			●●●●●			
Angel Suare <small>[Healthy food open]</small>			●●			
Fleur Prins <small>[Healthy food open]</small>	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●

LINKING ACTIVITIES IN CONTEXT TO ...

REFLECTION ABOUT ACTION




Figure 7: The teacher invites the student to the tabletop

WHAT MAKES IT PERSONAL IS ...

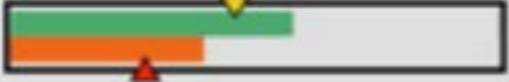
FEEDBACK ...



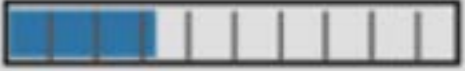
Goetz, T. (2011). Harnessing the Power of Feedback Loops | Magazine.
wired.com. Retrieved August 22, 2011, from http://www.wired.com/magazine/2011/06/ff_feedbackloop/5/

▼ activity 

▼ tags ComputerGames **ComputerHistory**
 ComputerScience Demos Design Flash **Flow**
FutureTechnologies GameBasedLearning
GraphicDesign GUI HCI Journals JSON
LearningTechnology Literature LSA Mace
 MMURPG MobileLearning OpenSource Perl
 SOAP SocialSoftware
TENCompetence Usability
 Visualisation Web WebAnimation
WebApplications WebDesign XML XUL

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 GraphicDesign GUI HCI Journals JSON
 LearningTechnology Literature LSA Mace MMURPG
 MobileLearning OpenSource SOAP SocialSoftware
 TENCompetence Usability Visualisation Web
 WebAnimation WebApplications WebDesign XML
 XUL

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 FutureTechnologies GameBasedLearning Gaming
 GraphicDesign GUI HCI Journals JSON
 LearningTechnology Literature LSA Mace MMURPG
 MobileLearning OpenSource SOAP SocialSoftware
 TENCompetence Usability Visualisation Web
 WebAnimation WebApplications WebDesign XML
 XUL



context indicators ...

Course: Dominique's Course - Mozilla Firefox

File Edit View History Delicious Bookmarks Tools Help

Dominique's Course Location: Time spent on course: 01:32:11 You are logged in as [Christian Glahn \(Logout\)](#)

Moodle1 ▸ DV101 Switch role to... Turn editing on

Activities

- Assignments
- Choices
- Forums
- Quizzes
- Stoodle Modules

Topic outline

On this forum, you are requested to post at least two questions arising from your reading of the resources. All questions will be answered by the instructor.

- News forum

1 Five Usability Principles in Web Design - COURSE MATERIAL

Indicators

Your Actions ██████████

Peer Actions ██████████

Latest News

Upcoming Events

Recent Activity

Search Forums

Advanced search ?

Administration

Course categories

- Main
- Testing
- All courses ...

GISMO

Resource 9

Done

Indicators

My actions ██████████

17 actions. Previous group in the course performed in average 73 actions (for an average final test score of 13/20)

reflection amplifiers ...

Personal Context Notifications



Figure 8.2. Student reflective practice a. Daily SMS received by students. b. What were your main learning channels today? c. How intense was your learning day? Rate it from 1 to 5.

BEST DEMO AWARD - ECTEL 2014

Presentation Trainer

#SUMMARY

SO ...

- #1 There are seams between the different learning contexts, locations, times, social contexts, ...
- #2 There are opportunities with new technologies that are open, ubiquitous, context-aware, and personalized.
- #3 look at the aimed effects on awareness, curiosity, creativity, knowledge, latent variables, ...
- #4 think careful about methodology and experimental designs dependent on your research questions ...



THANK YOU !

M.M. SPECHT



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