


AGORA
CENTER
10^{YEARS}


Agora

Benefiting society through
interdisciplinary co-creation

Year 2012



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Ambitious Co-creation



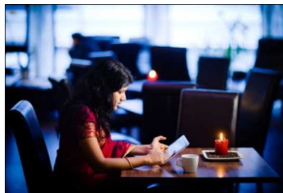
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Human technology

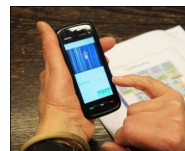


- Refers to the human-centered approach to technological systems and methods that take into account human needs and requirements as its implications for humans.



Agora Concept

- Human factors in technology
- Interdisciplinary approach based on top level research
- Research + teaching + business
- Shortening the innovation chain
- Human-centric service innovations

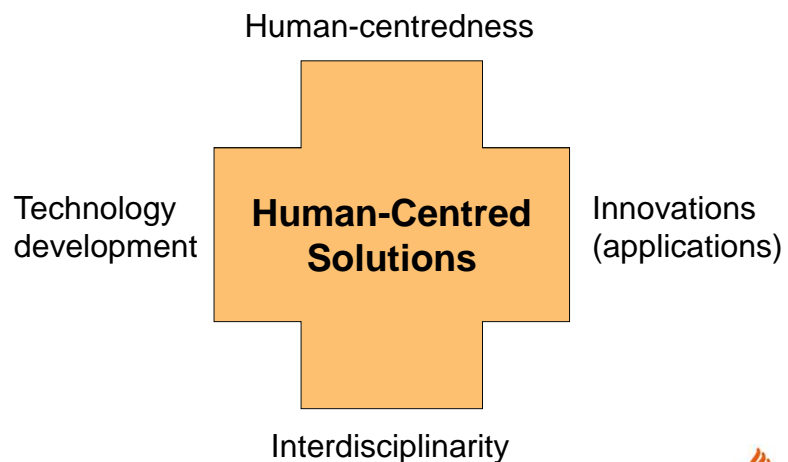


Agora Center

- The Agora Center was established in 2002 to provide a platform for interdisciplinary research in the field of human technology.
- In the passing decade, the Agora concept has proved successful.
- Multiple projects in various research fields have developed ingenious and beneficial applications.



The Agora Center corner stones



Research Professors in the Agora Center interdisciplinary settings



- Research professor in innovation processes, specifically service innovations, Ph.D. Antti Hautamäki (Head of Department)



- Research professor in innovative learning environments and human technology-enhanced teaching, Ph.D. Marja Kankaanranta (Vice Head)



- Research professor in road traffic, specifically road safety, Ph.D. Mikael Sallinen (in collaboration with the Finnish Institute for Occupational Health)



- Professor in technology-enhanced language learning, Ph.D. Ulla Richardson



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HUMAN TECHNOLOGY
An Interdisciplinary Journal on Humans in ICT Environments

ISSN: 1795-6889

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Human Technology

An Interdisciplinary Journal on Humans in the ICT Environments

- Open Access Online Journal for Interdisciplinary, Innovative Research
- Reaches both researchers and companies from all around the world
- Editor in Chief: Professor Päivi Häkkinen

www.humantechnology.jyu.fi



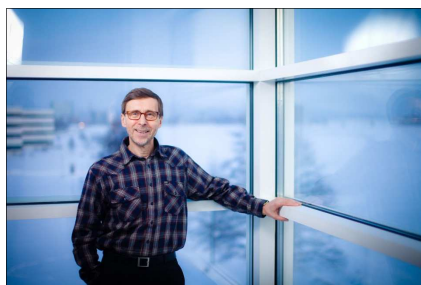
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Research outcomes

- More in our eBook:
<http://agoracenter.jyu.fi>



Significant outcomes 2005→



- International awards to breakthrough research**
 - International awards by the Society for Research in Child Development and by the International Society for the Study of Behavioural Development to Professor Lea Pulkkinen
 - Philips Nordic Prize to Professor Heikki Lyytinen
 - Bernard Bolzano Honorary Medal by the Czech Academy of Sciences to Professor Pekka Neittaanmäki
- Several international projects, including, e.g. a Marie Curie Excellence Team, and Nordic Innovation Centre funding**
- International online journal Human Technology**
- Centre of Excellence in research nominated by the Academy of Finland: Learning and Motivation**
- International center for computational sciences (SCOMA)**
- FiDi-Professors** (Jacques Periaux, Amir Averbuch, Asoke K. Nandi)
- Significant role in the regional innovation hub**



Our Services in the Partner Network

Contract Research

- We offer our expertise. Engage our research teams to solve your specific problems and innovate new solutions.

Research and Development Projects

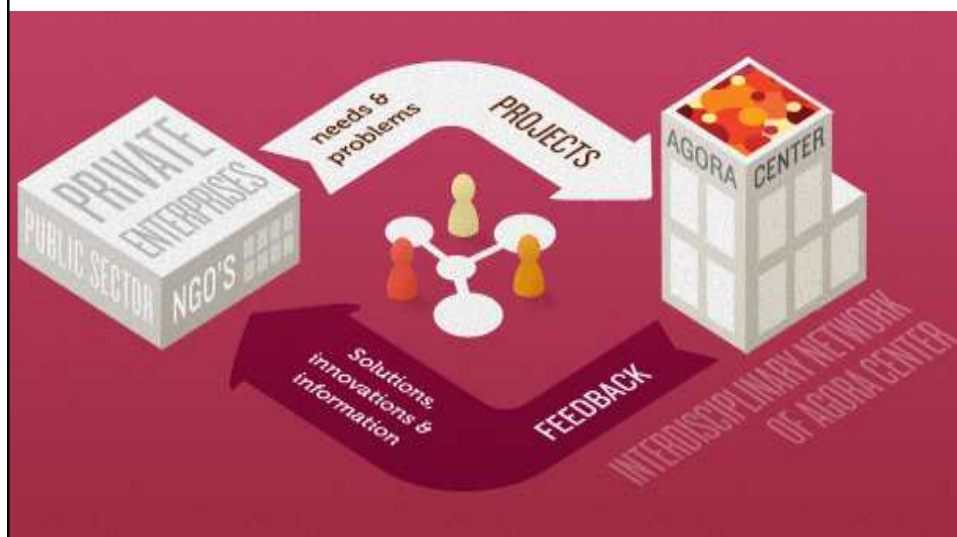
- We co-create with you. Let us plan together a joint project that integrates our interdisciplinary research expertise with your particular skills and business or domain expertise.

Forums and Seminars







- We invite you. Join our Open Forums of learning, discussion and dialogue. Invited keynote speakers from Finland and abroad open the debate on a number of interesting topics.



Co-creation and research process with the Agora Center




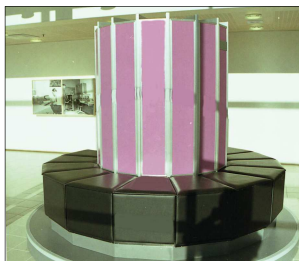
Faculty of Information Technology

-  Founded in 1998
-  Two departments
 - Department of Mathematical Information Technology
 - Department of Computer Science and Information Systems
-  Research and teaching in Computing Science since 1967
-  Amount of staff 200
-  1,500 basic degree students, 150 postgraduate students
-  Active cooperation with enterprises






Finnish Data Processing Museum Association in Agora

-  A continuous, free exhibit of data processing devices in the Agora building.



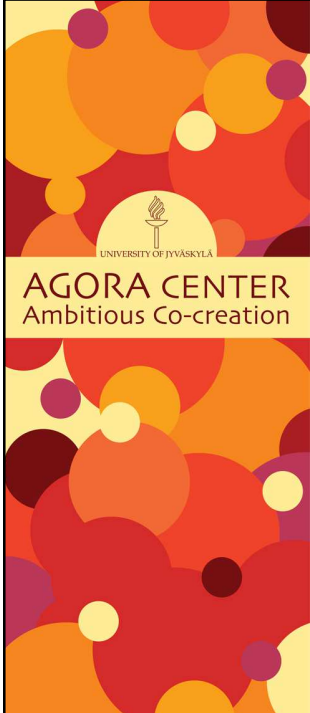
Supercomputer Cray 1S from the 1970s.

The association:

-  Collects and preserves data processing devices and other material related to data processing.
-  Presents exhibitions related to data processing at various sites around Finland.
-  Converts into contemporary formats information from older formats, e.g. punched cards.








For more information:
<http://www.jyu.fi/agora/en>

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GraphoGAME - a digital game for learning to read



Grapho Learning Initiative

Our vision is
to **help millions of people**,
who otherwise would not have access
to **basic skills**, such as **reading**,
and be able to launch themselves
to a sustainable **learning** curve
and a **road to prosperity**.

GraphoGame

A science-based online digital learning environment for learning to read

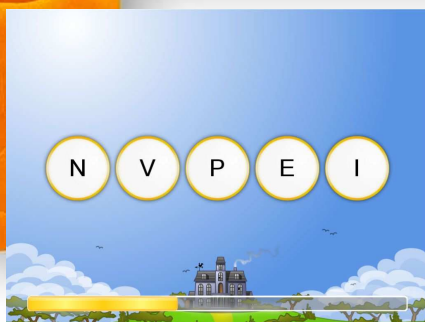
Based on 20 years of research on reading development and dyslexia

The efficacy of Graphogame training for early reading skills development has been attained from controlled intervention studies

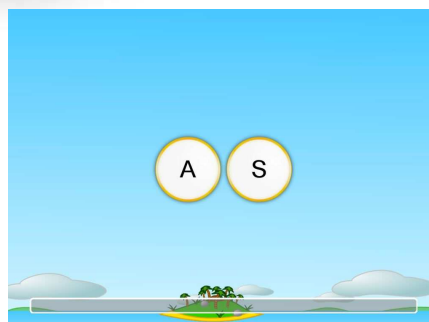
Based on individually adaptive and intensive, focused training of connecting speech sounds to written symbols



Graphogame



Letter sound recognition task



Letter sound recognition task



Assessment level



Story book reward

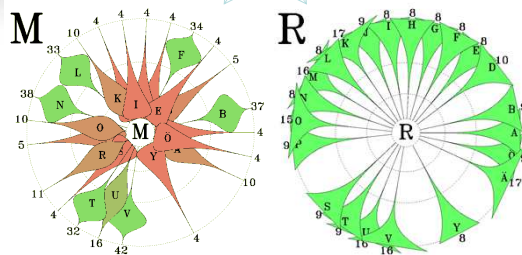


Sticker book reward

Obtaining information on the progress

Player's supervisor can follow progress from e.g.,

- Result tables
- Daisy graphs



Target impulse	Number of occurrences	The percentage of the first seven trials	The percentage of the last seven trials
a	32	100%	100%
b	12	100%	100%
c	8	100%	100%
d	8	100%	100%
e	8	100%	100%
f	8	100%	100%
g	8	100%	100%
h	8	100%	100%
i	32	100%	100%
m	12	86%	87%
n	24	100%	100%
o	20	100%	100%
p	20	86%	100%
r	12	86%	86%
s	12	100%	100%
t	16	100%	100%
u	8	86%	86%
ag	8	100%	100%
an	12	100%	100%
ap	12	71%	86%
at	12	86%	100%
ba	8	86%	86%
bm	8	86%	86%
bn	8	100%	100%
bp	16	86%	100%
bt	8	86%	100%
bu	8	100%	100%
up	8	86%	71%
um	8	57%	43%
un	8	57%	43%
avg	8	100%	100%

Learning to Read

- **Graphogame™ is a science based solution for solving global illiteracy.**
 - Developed by the University of Jyväskylä and Niilo Mäki Institute to help children around the world to learn to read.
- **Based on 20 years of research on dyslexia by Professor Heikki Lyytinen's research team.**
 - Currently developing a sustainable business model to export this Finnish learning solution to hundreds of millions of users on a global scale.



Global Illiteracy

Biological reasons (% of population)

- » Global – 5%
- » Finland – 3% (and other transparent languages)

Educational reasons

- » Global - up to 90% (especially developing countries)
- » Finland – 0%



Current User Base

- Graphogame™ is currently available free of charge to all the learners of the Finnish language.
- In Finland we have already reached the user target of 3% of population.
 - Children who need effective help in learning to read on the first grade of school.



Research Evidence

- **We have gained research evidence on the efficacy of Graphogame™ training.**
 - from transparent writing environments
 - to some degree also from more non-transparent orthographies including English.
- **Our partner network is tackling global challenges**
 - Biological factors (dyslexia)
 - Insufficient teaching
 - Lack of social support



GraphoWorld Our Network of Excellence



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UNIVERSITY



Universitetet
i Stavanger



University of Zurich



THE SCIENCE OF THE SPOKEN
AND WRITTEN WORD



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<http://grapholearning.info/graphoworld>

GraphoWORLD's Mission

- The mission is to offer technology-enhanced support as widely as possible to all learners globally
- Research first: Only evidence-based support on learning will be offered to learners validated by experimental studies

Grapho Learning Initiative: Objective

- **Graphogame™ aims to develop a non-profit business model for learning and training literacy skills.**
 - Global distribution and service
 - Specialized on the local (language) level
 - Delivered via non-profit business model
- **Proof-of-concept on university based service innovation process.**

Educational Games

Global Competition

- There are plenty of digital educational games aimed to support the development of literacy skills in the world's main languages.
- However, surprisingly, there is a complete lack of games which are
 - Based on scientific theories
 - Efficacy studied and transparently documented
 - Developed for the smaller languages



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Business Model

- Graphogame™ will help hundreds of millions of people to learn to read.
- We are creating a non-profit business model that includes public and private, and benevolent donor funding.
- How could you join us?



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Tekes




JYVÄSKYLÄN YLIOPISTO

Innovative Learning Environments



professor Marja Kankaanranta
University of Jyväskylä



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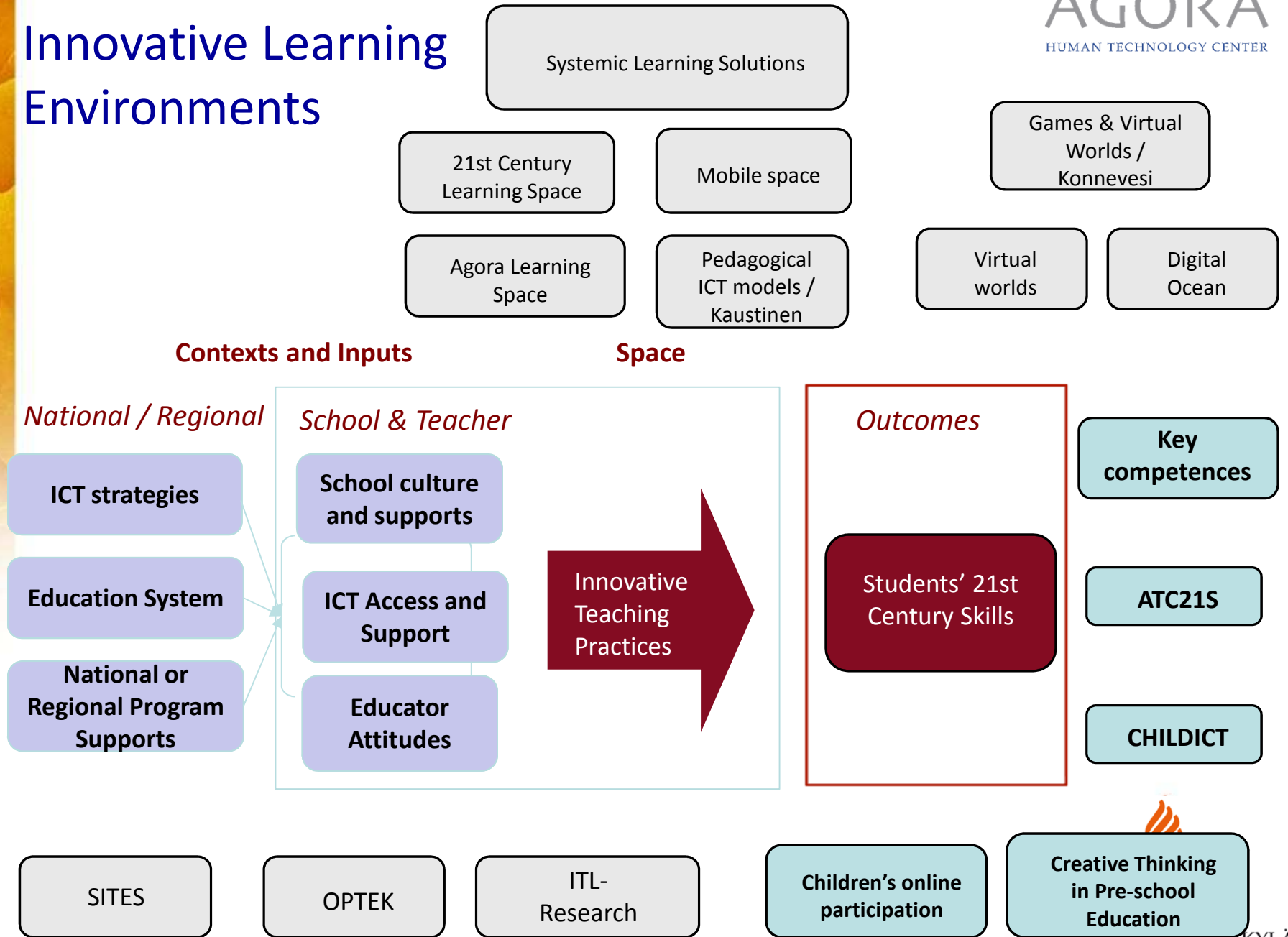
The *Innovative Learning Environments* research area

- The overall aim is to study new and innovative learning spaces in all their diversity
 - Promotion and assessment of 21st century skills
 - Transformation of teaching practices and the impact those changes have on students' learning outcomes
 - Systemic implementation of digital learning solutions into the educational system
 - Educational possibilities of virtual environments and games
 - Learning spaces, including their virtual aspects
 - Mobile solutions directed to learning and well-being



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Innovative Learning Environments



Main Research Projects

International

- **Assessment and Teaching of 21st Century Skills:** Design of Assessment tasks, University of Melbourne, sponsored by Microsoft, Intel, Cisco, 4 countries / Finnish study funded by Ministry of Education and Culture,
- **Innovative Teaching and Learning Research,** SRI, sponsored by Microsoft, 8 countries / collaboration with National board of Education
- **Second Information Technology in Education Study,** IEA study, altogether c. 40 countries during 1997-2006 / follow-up data on ICT use at schools
- **Digital Ocean,** EU funded project, lead by Digital divine, France / Finland: design of virtual game-based ocean, partner company: Ludocraft
- **Creativity in Pre-school Education,** EU network (Comenius) / Finland: ICT supported creativity
- **Key Competences,** EU network
- **CHILDICT,** Nordplus network Curriculum in kindergarten? Language learning and use of ICT with small children.

National

- **Education Technology at Schools,** Tekes, 28 companies, 13 Research Institutes at 8 universities and VTT, Ministry of Education and Culture, Ministry of Communication, National Board of Education Lead by Kankaanranta
- **ICT resources at schools** / Learning Environments coordination project, funded by National Board of Education, Collaboration with city of Kaustinen
- **Learning games and virtual worlds** / Learning Environments coordination project, funded by National Board of Education, Collaboration with community of Konnevesi
- **Children's rights** / Online participation, Finnish Childombudsman / Ministry of Social and Health Affairs
- **Learning spaces,** RYM SHOK, Tekes, companies / Design of Agora Learning Space
- **Systemic Learning Solutions,** Tekes / Learning Solutions program

Regional

- **Mobile Space of Learning and Well-being,** Tekes, companies (Nokia, Corusfit), four cities
- **Agora Learning Space**



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Research Team 2012

- Marja Kankaanranta, professor (AC & IER)
- Inka Mikkonen (PhD, research coordinator)
- Mikko Vesisenaho (PhD, research coordinator)
- Arto Ahonen (PhD, Ed.sc.), Research-based design of 21st Century learning and assessment tasks, ATC21s (IER)
- Ahmer Iqbal (doctoral student, comp.sc.), Virtual worlds (AC & Faculty of IT / Comas)
- Jaakko Joutsu (researcher, physics), 21st century learning space
- Jarno Kansanaho (project manager), Digital Ocean
- Marko Kauppinen (PhD, project manager), systemic learning solutions
- Inka Kotsalainen (research assistant, Early childhood education), creative learning and technology use (AC & Faculty of Ed.)
- Anna Laattala (research assistant, comp.sc. / teacher ed), ITL research & Learning space
- Erkki Mauno (project researcher, comp.sc. / teacher ed.), mobile learning
- Juho Norrena (researcher, comp.sc / teacher ed), innovative teaching practices, ITL Research (AC)
- Tuula Nousiainen (PhD, comp.sc.) user-driven technology design, mobile learning (AC)
- Kristiina Nurmela (researcher, inf.systems, educational sciences), systemic learning solutions (Faculty of IT)
- Jenni Rikala (researcher, comp.sc), mobile learning, systemic learning solutions
- Terhi Tuukkanen (doctoral student, sociology), children's online participation (AC & Finnish Cultural Fund)

+ close collaboration with the Faculty of Information Technology

- professor Pekka Neittaanmäki, Dr Leena Hiltunen



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Mobile Learning

Development principles,
application prototypes and
field trial experiences



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Basic Development Principles

- User-driven design
 1. Determining general needs and focus areas with representatives of partner municipalities
 2. Developing more specific ideas and concepts with different subject-area experts and end users
 3. Field trials in real use contexts
- Gamification and motivation
 - Arousing and sustaining motivation is a key issue in the use of mobile solutions
 - Gamification = using game-like elements in non-game contexts
 - E.g. visualizing progress, unconventional ways of inputting data, obtaining rewards, developing/constructing something based on achievements etc.

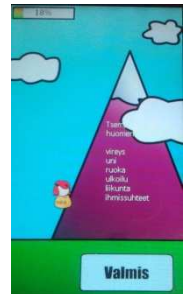


Application prototypes



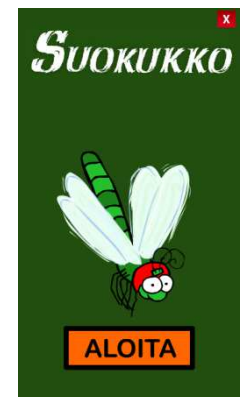
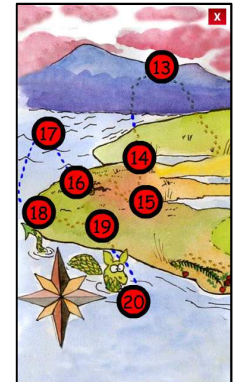
"Islands of the Mind"

- Supporting the life management of young students
 - Raising the students' awareness of their own behavior and motivating them to pay more attention to their own wellbeing
- Follows the students' daily activities
 - The amount and quality of sleep, the amount of physical activity, general mood, meal patterns, and social relations
- Use of gamification
 - Unconventional ways of inputting data
 - A motivational mini-game as a reward
- **Experiences**
 - Has made the students pay more attention to their habits (especially sleep, exercise and meals)
 - Can support the students' life management and guide them towards self-monitoring and self-reflection



Suokukko (Ruff)

- Mobile application based on an existing e-learning environment for creative writing (www.suokukko.net)
 - Different tasks related to building stories (or particular elements of stories), many of them game-like
 - Aims to increase self-esteem and encourage children to write and express themselves
- **Experiences**
 - Interesting, motivating, visually appealing and suitable for different learners (according to both experts and children)
 - Guides children to give peer feedback to others
 - Clear structure, supports the learners' autonomy
 - Mobile version was preferred over the web version (due to being independent of time and place)



Nature Tour (Luontoretki)

- A recording tool for kindergarten groups when observing the surrounding nature
 - Documenting observations and comparing the findings with each other
 - Photographs, audio recordings
- **Experiences**
 - Easy to use, motivates and inspires especially the youngest learners to observe the environment
 - Is a good way to take learning beyond the walls of the classroom
 - Applicable to different user groups by modifying the level of detail of the contents
 - Could include also e.g. narrative features



A Visit to the Zoo

- Based on the map of Ähtäri Zoo
 - When visiting the zoo (e.g. on a school trip), the visitors keep the map visible on their phones throughout the tour
 - Information about different animals along the route + mini-games related to some of the animals
- Experiences**
 - Easy to use, intuitive, useful, fun
 - Information texts encourage communication and interaction between users during the tour
 - Different users get different texts → exchanging information with others



Sports Game (Catch the Flag and Run!)

- Electronic team game based on the traditional game "Capture the Flag"
 - Players try to rob a flag from the opponents and take it to the home base
- The players follow the game on their mobile devices
 - The players can see the location of their own avatars, the locations of the other players and the flag, and the team's score
 - To get the flag in the virtual game, the player needs to go to the flag by moving in the real world

Experiences

- The game motivated the students to move and encouraged collaboration
- The students were very interested in the statistics telling them how many metres they had walked/run during the game session
- The students felt that they would like continue using the game (recess, physical education classes, free time)



Learning with QR Codes

- Two-dimensional codes containing various sorts of information (e.g. text or video clips)
- Enriching learning experiences both inside and outside the classroom
 - Treasure hunts (adding interesting elements to the activity)
 - Combining with more traditional teaching methods and materials (e.g. worksheets where the codes provide the learner with an opportunity to utilize different multimedia resources)
- **Experiences**
 - Increases motivation through an element of curiosity (finding out what is "hidden" in the code)
 - The combination of learning and physical activity can result in new kinds of memory cues
 - Supports both self-directed and collaborative learning



Primary school 1

- We arranged treasure hunt for the students
- The overall objective of the lesson was to enhance students' information retrieval skills
- Coloured QR codes guided the students through the route and a black QR code contained the actual task, which the students completed after the treasure hunt on a computer



"The QR activity was a really nice variation to the normal school day!"

Primary school 2

- We arranged a paper-based trail activity to guide learners through the self-assessment process
- Topics related to physics
- Student groups prepared a web page and worksheet with questions with an embedded QR code
- The worksheets were distributed around the school and students went through them



Secondary school

- We arranged a story trail activity for the students
- The aim was to study if the students would get more inspiration in the woods by going round the QR code trail than in the classroom by using traditional methods

"It was nice to learn in a different way rather than by reading a book. There were some problems with the phone but it was fun!"



Upper secondary school

- We arranged a QR activity that guided the students at the gym
- YouTube video which was showing how to do movements correctly was embedded in a QR code
- The students scanned the codes, watched the videos and performed the movements



To conclude...

- Promising results and feedback
 - Motivates students, especially in primary school (enthusiasm, novelty)
 - Support for both collaborative learning (interaction emerging from the use of the applications) and individual learning (setting one's own pace)
- Needs and ideas for the future
 - Longer and more extensive studies
 - Further exploration of the use of gamification and narrative features



Thank you!

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