



From Consumers and ProSumers to
Designers of learning:
**Students as Co-Designers of Learning
Expeditions in CrossActionSpaces**



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@Laeringsfestivalen2018, Trondheim, Norway



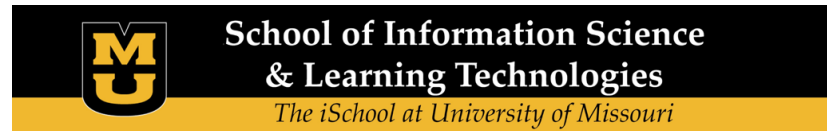
University of Missouri

Established 1839



Our Study Program:

Educational Technology (for school teachers)



sislt.missouri.edu

Educational Technology –

fully online (1999 first online course)

Information Experience Lab, IELab: **User Experience Studies (UX)**

ielab.missouri.edu

- Mobile microlearning apps
- Tool for strategic improvement planning at schools
- Data visualization tools
- Health Care Technologies
- Panacea's Cloud
- And many more...

My research (selection)

**Interdisciplinary: Social Sciences, HCI,
Educational / Learning Sciences**

Higher education

- **InPUD**, technology-embraced informal-*in*-formal learning (Germany, NRW grant: 2001-2004) study until 2009 (Jahnke, 2012)
→ *Foster a learning community in which students feel like a valued member!*
- **DaVINCI**, creativity in higher education (BMBF grant, 2008-2011) (Jahnke, Haertel, & Wildt, 2015/7)
- **PETEX**, Remote labs in engineering education (EU grant, 2009-2011) (Jahnke et al., 2011; Terkowsky et al., 2012)
- **GoogleGlass** project, dentistry education, Eva Marell-Olsson (Jahnke, Marell-Olsson, & Meitoft, 2015)
- **LeXMizzou**, Learning Expeditions, games for learning apps (IIFund 2016-2017) (Ringbauer et al., 2016)

K-12 schools

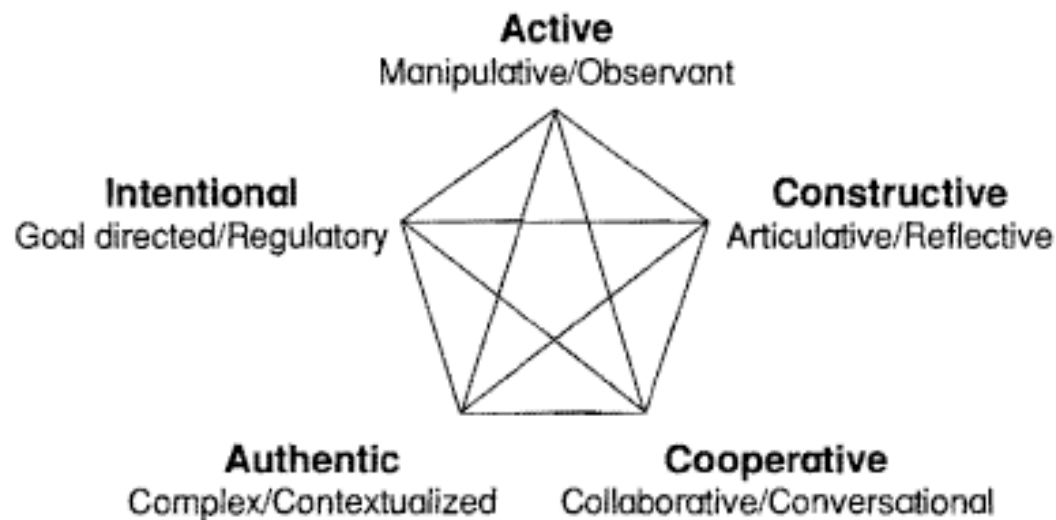
- **1:1 Tablet classrooms in DK, SWE, FIN** (VR, Swedish Research Council grant, 2014-2016) (Jahnke et al., 2017)

Intercultural: Germany, Sweden, USA



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Foundation:
Meaningful learning *with* technologies
(and not from!)



Howland, Jonassen, & Marra, 2012



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From surface to deep learning

David Kember, 1997

•Teacher-centered
•Content-oriented
surface levels

•Topic oriented
•Problem solving
Deep, meaningful learning

I

II

III

IV

V

Information
Delivery

Delivery of
Structured
Knowledge

Teacher
Student
Interaction

Facilitation
of Under-
standing

Supporting
**Conceptual
Change** and
Intellectual
Development
(**behavior
change**)

David Kember, 1997
Johannes Wildt, 2012



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When we are taking '*designing for meaningful learning with technology*' seriously,...

...then students are agents of their learning – and even more, they become “co-designers”



Theoretical lens – Design for Learning

Design is the act of giving a form to a 'something'.

Teaching is the 'design act' of creating conditions for learning.

More specific: it is the act of modelling
sociotechnical-pedagogical processes to enable student learning

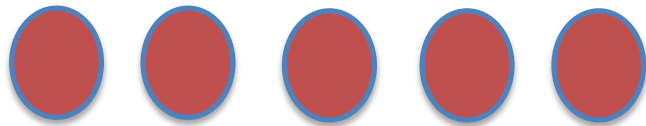
Bonderup-Dohn & Hansen, 2014
Jahnke, Norqvist, & Olsson, 2014



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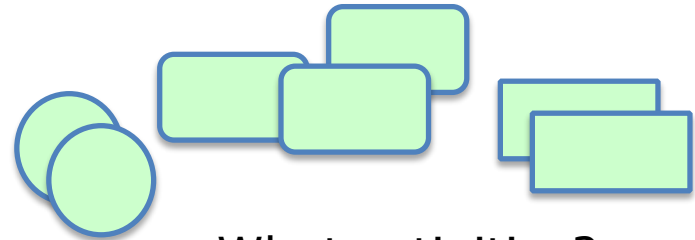
Things to consider...

trad. Class Design **vs.** Process Design



Element for organizing learning is
a) meeting place
b) regular meetings

Element for organizing learning is the **process** that supports learners to achieve learning goals (competencies)



What activities?
What resources?
What roles?
When, where?



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Anders Norberg

- 2011, **A time-based blended learning model**
- 2017, **From blended learning to learning *onlife*: ICTs, time and access in higher education**

Designing for Learning

Traditional course design:

Textbook driven

Content driven

Location/place-based driven

the answer is known

Students are consumers

Design the **process**!

****Do not**** organize learning around textbooks or meetings points, but: design the process.

→ **When the answer is not known! (G.Fischer)**

Students are pro-sumers.



From traditional course-based learning to meaningful learning expeditions

Learning expeditions stand for rather open-ended, problem-based learning paths and processes which include aims-oriented learning to master X, or explore and understand the implications of N, in which the learning methods and instruments are very open,

that take place in **CrossActionSpaces** with reflecting peers where process-based assessment (criteria and guided reflection) supports the learning progress.

No straight-ahead process but loops, back and forth: detours!

Jahnke, Norqvist, Olsson, 2014
Norberg & Jahnke, 2013



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Students in different roles

Co-designers of
learning

Teachers for
peer learning

Active
learners/agents

Consumers of
learning

Now, finally, here are the projects!



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Beyond the Campus Walking Tour: An ARIS Augmented Learning Expedition

Sara Ringbauer, So Mi Kim, Fatih Demir, Michele Kroll, Shann Bosaller, Joe Griffin, Hao He, Nilay Muslu, & Isa Jahnke

INTRODUCTION

- The university tour could be reconceived as a Learning Expedition in the digital age (Jahnke & Norberg, 2013).
- We developed a university tour for students that combines elements of both an in person tour and a digital tour using the principles of Augmented Reality Gaming.
- The project goal is to make the tour more meaningful to students in terms of becoming community members.
- We call it an Augmented Learning Expedition.

TESTING

Students explored the campus and completed activities at each of the seven stops to collect a game token. The seven tokens were then exchanged for a reward.

A total of 130 students in grades 9-12 explored seven campus locations in adult supervised groups of 8 to 18 students. Each group shared 2 Wi-Fi enabled iPad2 tablets with the ARIS learning expedition app pre-loaded. Groups completed the expedition in two to three hours.

Two groups and took notes and video of the expedition. A total of 96 students filled out a questionnaire

RESULTS

Observations and survey data show that participants did not share the iPad equally and that Wi-Fi connection loss made navigation more challenging. Of the 96 participants, 12 said they used the iPad most often and 84 said they used the iPad least.

SUS (System Usability Score) 68 (n=7)

I feel like a member of the university

- Tend toward 3.8 for low iPad use (n=84)
- Tend toward 4.0 for high iPad use (n=12)

Selected Quotes

- "Great concept"
- "When you were not connected to Wi-Fi. It did not mark our locations"
- "Not enough iPads for each person"
- "Keep up the great work. Well done!"

Figure 3: Highlights of survey results

CONCLUSIONS

- Usability could be improved by moving towards 1:1 student to tablet/smartphone ratio.
- Initial results indicate that participants felt the tour made them feel "like a member of the university".
- Navigation could be improved by using cellular enabled tablets or smartphones that stay connected at all times.

REFERENCES

- Jahnke, I. & Norberg, A. (2013). Digital Didactics - Scaffolding a new Normality of Learning. In: Open Education 2030 - contributions to the JRC-IPITS Call for Vision Papers. Part II: Higher Education. <http://blogs.ec.europa.eu/openeducation2030/category/vision-papers/higher-education>. pp. 129-134.
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LeXMizzou 1, Spring 2016
Learners use classroom themes and connect them to the material world in which they are living

Students with the digital tour felt more like a member of the university than without

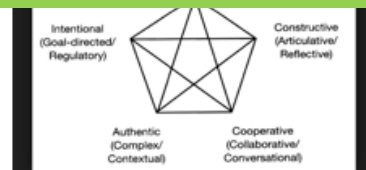


Figure 1: The five affordances of Meaningful Learning with technology (Howland et al., 2012).

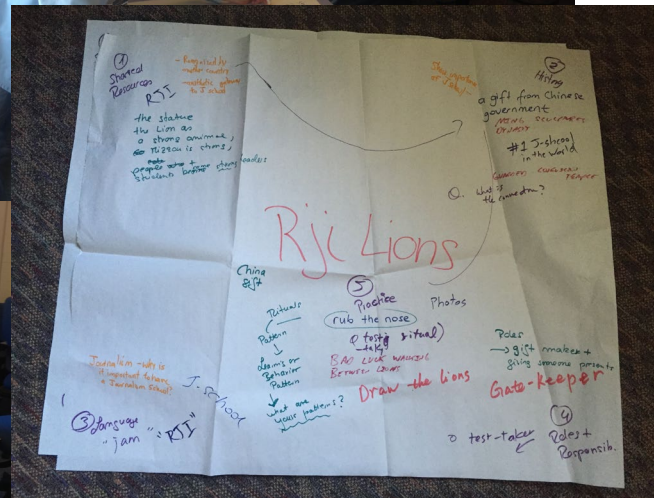
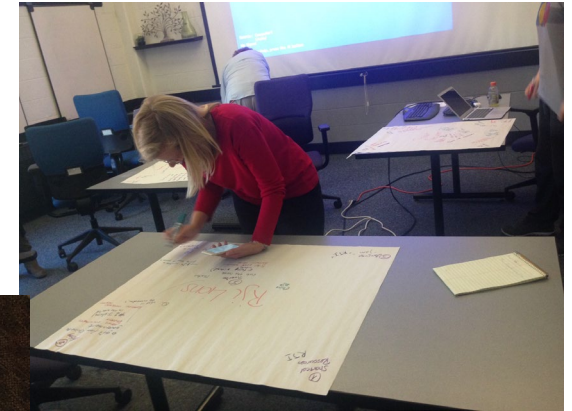
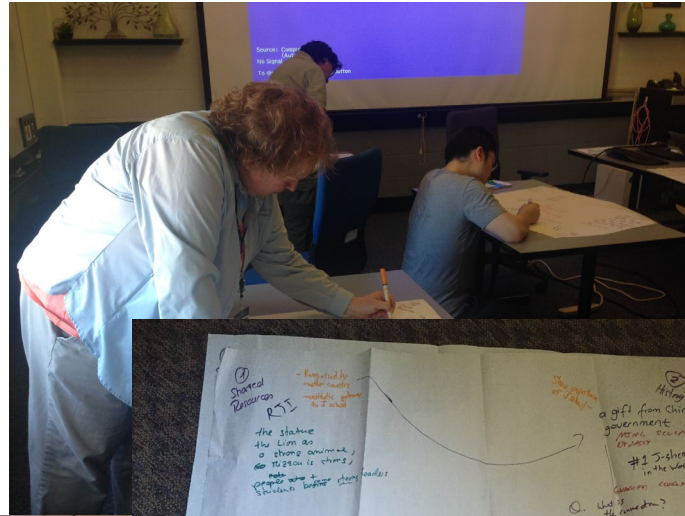
APPLICATION DESIGN

Step 1 of the design involved brainstorming five elements of situated learning: a) shared resources and artifacts, b) history c) language d) roles and responsibilities, and e) the social practice as interaction. We used a brain writing method to create game scenarios for each of the seven locations that included five elements of situated learning. Step 2 generated rapid paper prototypes. For Step 3, we held a workshop to learn ARIS Editor and turn the paper prototypes into scenes in our ARIS Augmented Learning Expedition.



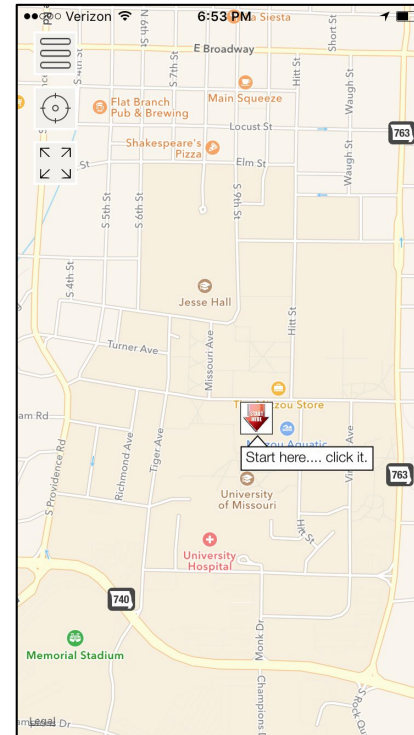
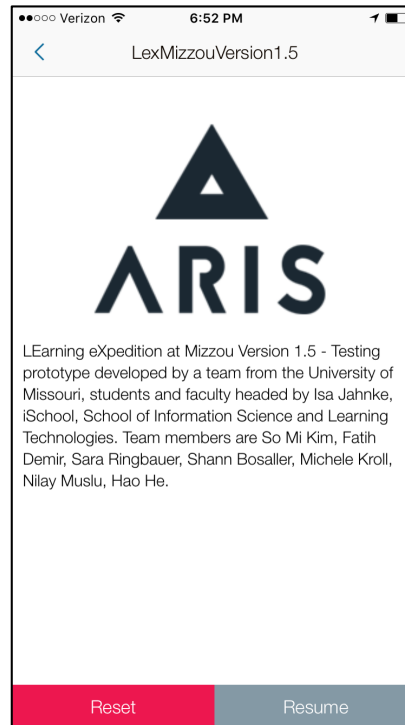
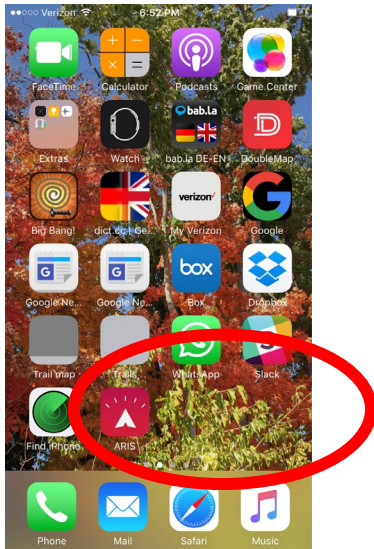
Figure 2: A group uses the LexMizzou ARIS app to navigate to the next game location.

Brainstorming and Group formation

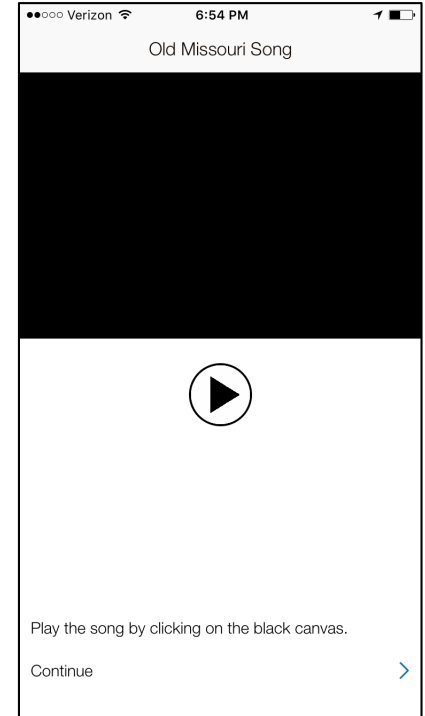
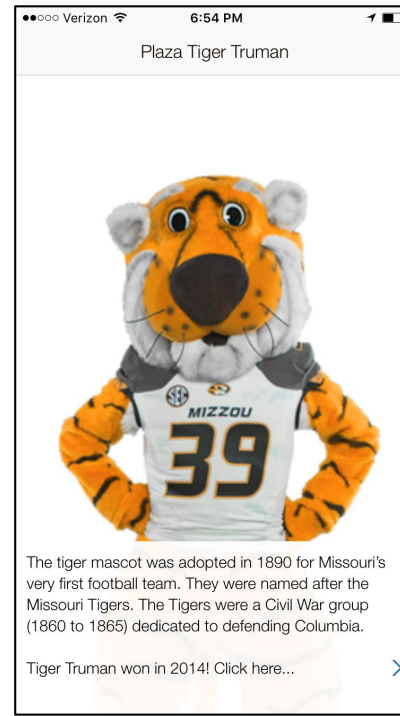
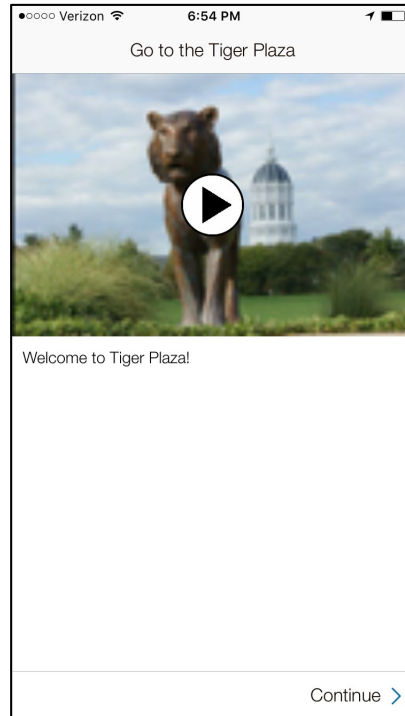
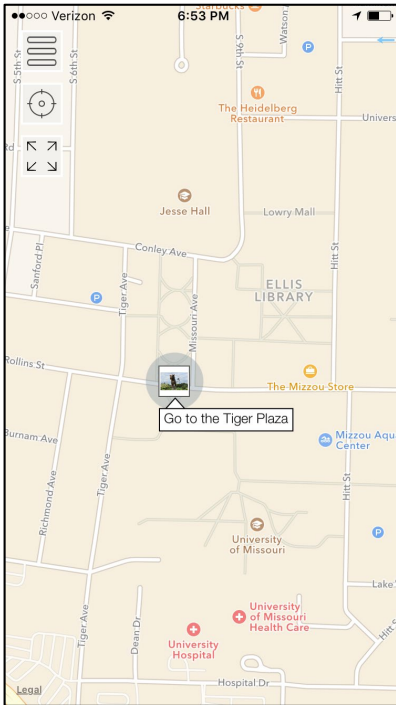


Example from LexMizzouVersion1

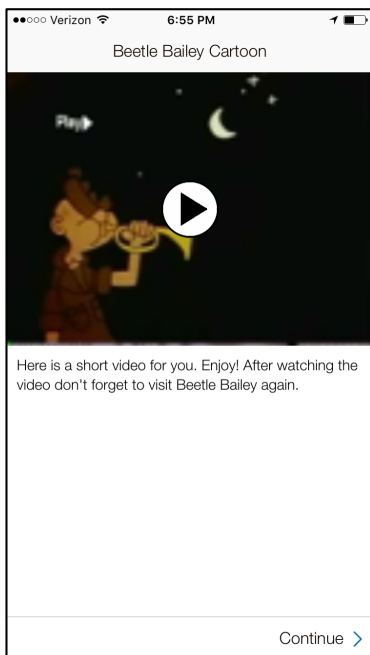
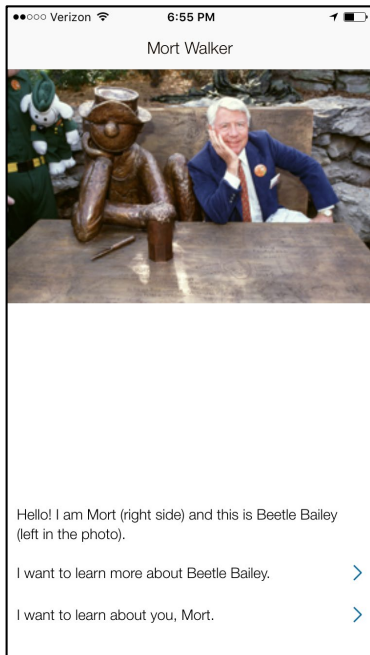
How it looks on the iPhone



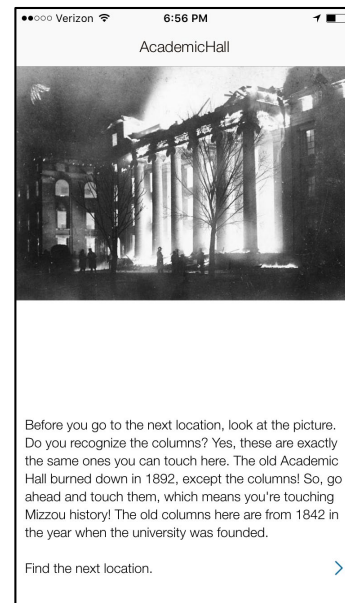
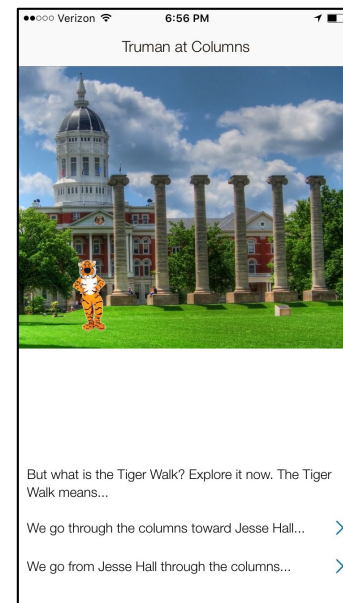
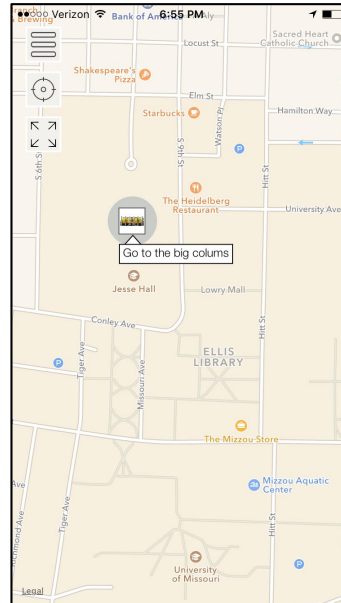
Tiger Plaza



Beetle Bailey

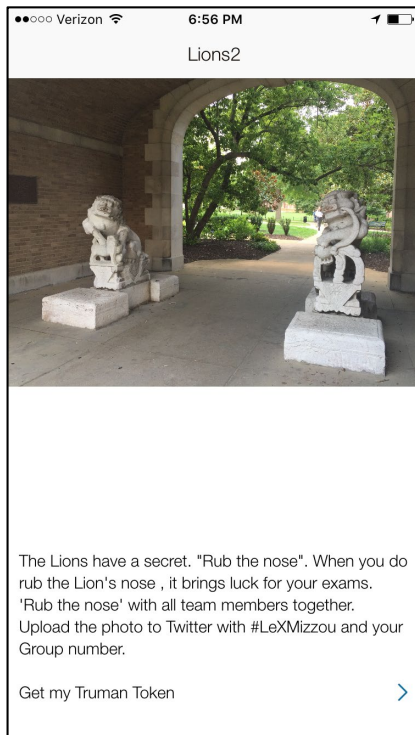


Columns

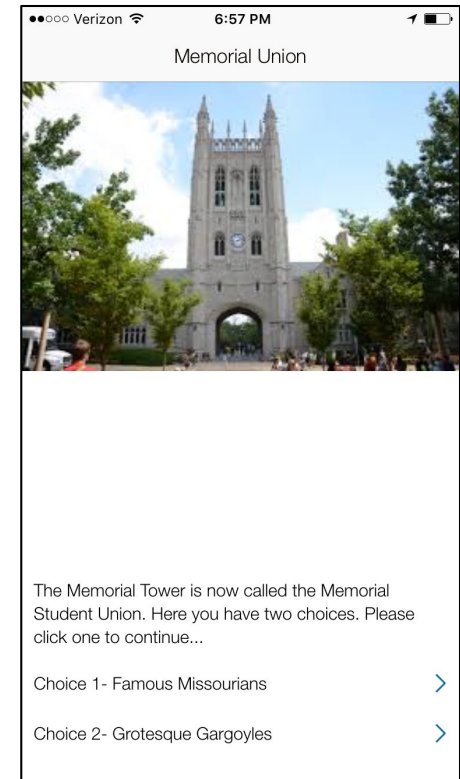
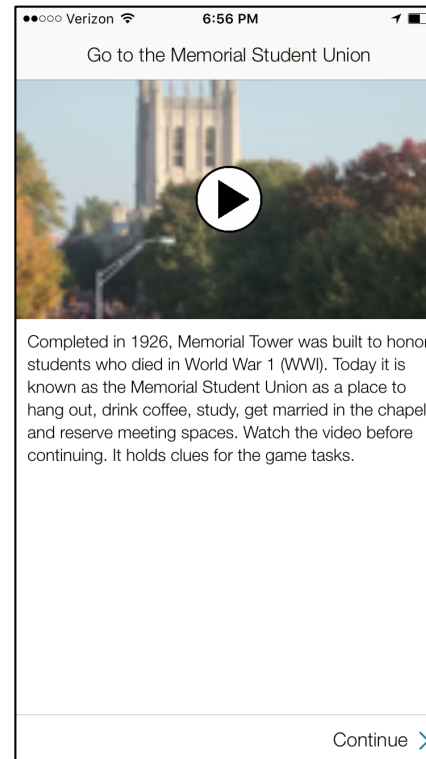


This is how the prototype looks on the iPhone.

RJI Lions



Memorial Union



LeXMizzou 2 – Spring 2017 with Michele Kroll

Exploring Students Use of an AR-gamified learning app



GuidiGo

Teams



Team 1



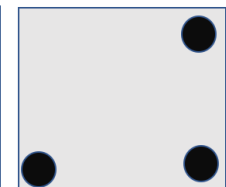
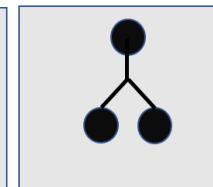
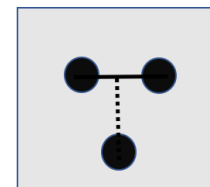
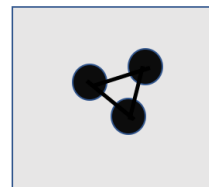
Team 2



Team 3



Team 4



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LeXMizzou 3 – Fall 2017

location-based interactive games for learning

<https://lexmizzou.com/>



LeXMizzou 2 in Fall 2018

Students are Digital Game Designers for
Learning eXpeditions at Mizzou

(Non-IT, Non-Technical students)



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Roles

Project leader

Usability Resource: Information Experience Lab & Allen Institute

Student team leaders

Hao He

Minh Pham

Devon Whetstone

Dylan Martin

4 teams

Researchers (surveys, interviews, documentation, observation)

Michele Kroll

Michelle Todd

Shann Bossaller

Dr. Alexander Nolte (Univ. of Pittsburg)

Mizzou Game Day - Expert Choice Award

Dr. Jenny Bossaller, Associate Professor, SISLT

Dr. Bimal Balakrishnan, Associate Professor, Architectural Studies



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14 students (4 teams) as game designers and developers

- **15 students originally signed up for the course, while 1 student dropped in the beginning of the course: N=14.**
- **9 females, 5 male**
- **5 from USA, 7 China, 1 Vietnam, 1 Iran,**
- **undergraduate (7), graduate (2) and doctoral degree (5) programs**
- **Study programs: Business/Marketing, Digital Storytelling, Architecture Studies, Journalism, Educational Technology, Library Science**



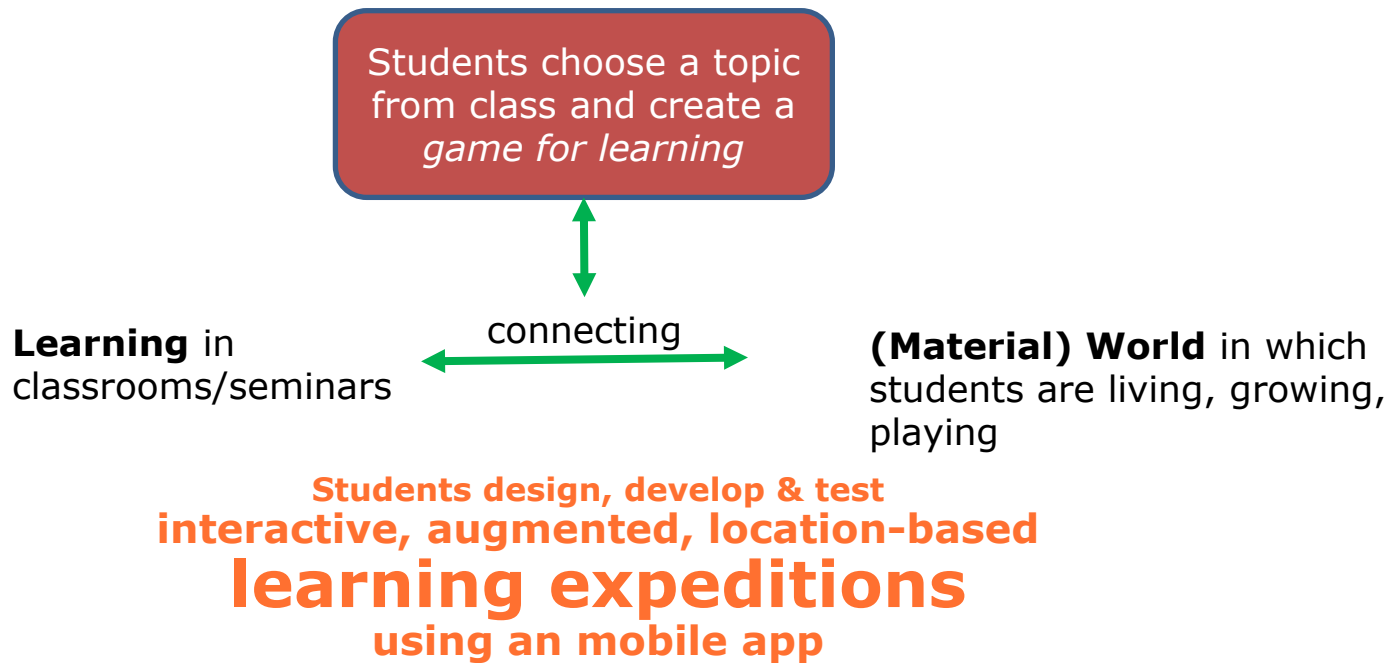
"... learning is a matter of belonging as well as intellectual process, involving heart as well as the head"
(p.29, Wenger et al., 2002)

Goal (that of the teachers)

After the course, students are able to

- a) build a digital game based augmented interactive learning expedition
- b) test their game ideas with usability study & accessibility (design for all) in iterative processes





Requirements for the game design

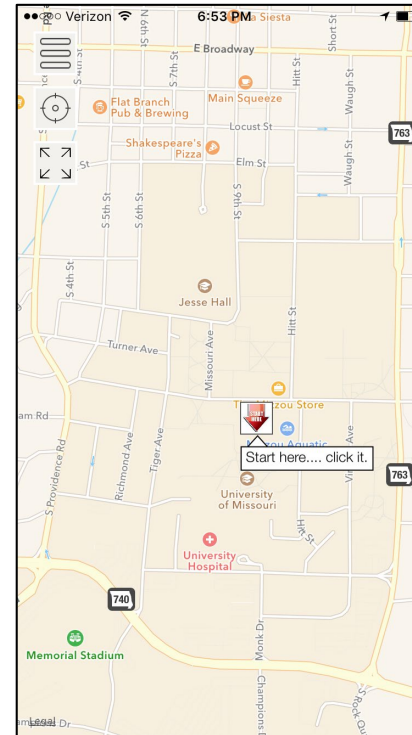
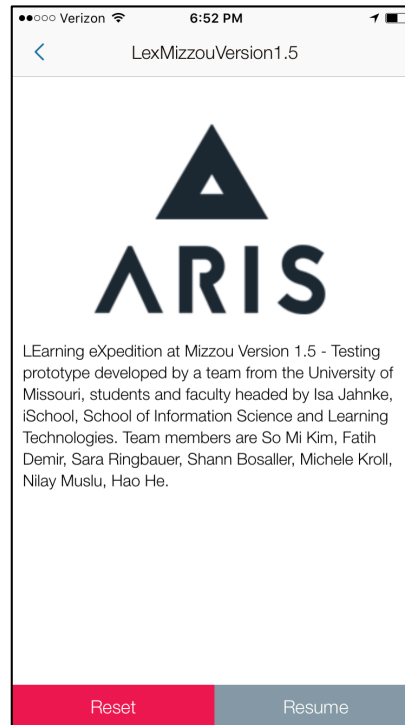
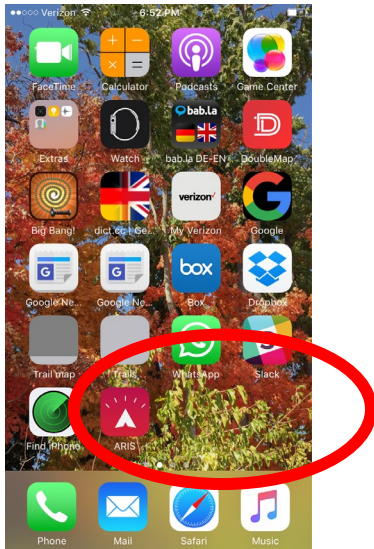
We asked students to develop a game with:

- a) **location-based** – has something to do with a place on Mizzou Campus
- b) **connected to learning** (ideal: meaningful learning with technologies)
- c) **interactivity** (collaborative learning) elements in the game



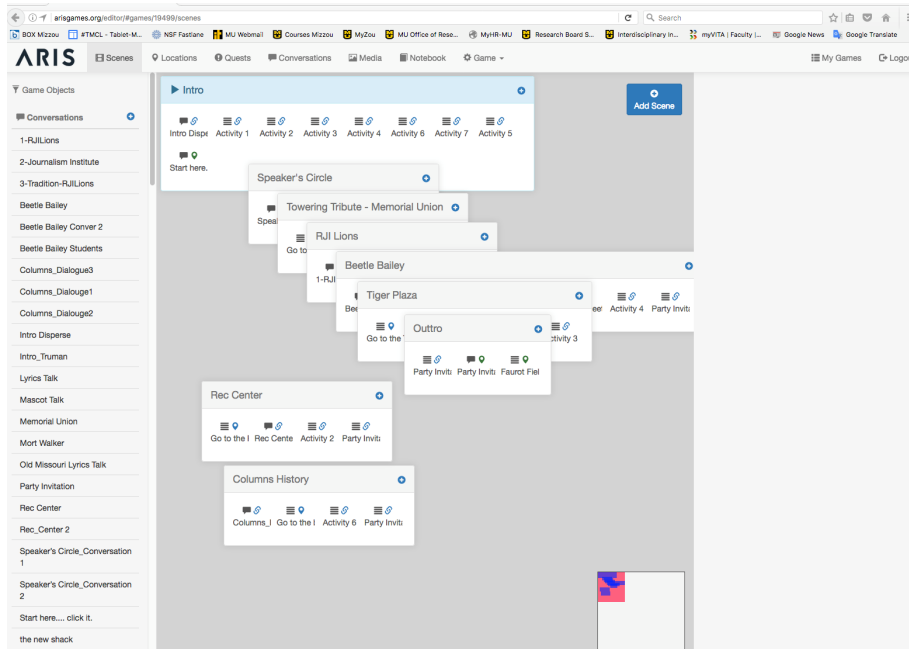
Example from LexMizzouVersion1

How it looks on the iPhone



ARIS Editor, Open source

<http://arisgames.org/editor/#>



Guidigo

Not open source

<https://www.guidigo.com/>



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Why did we (teachers/researchers) do this?

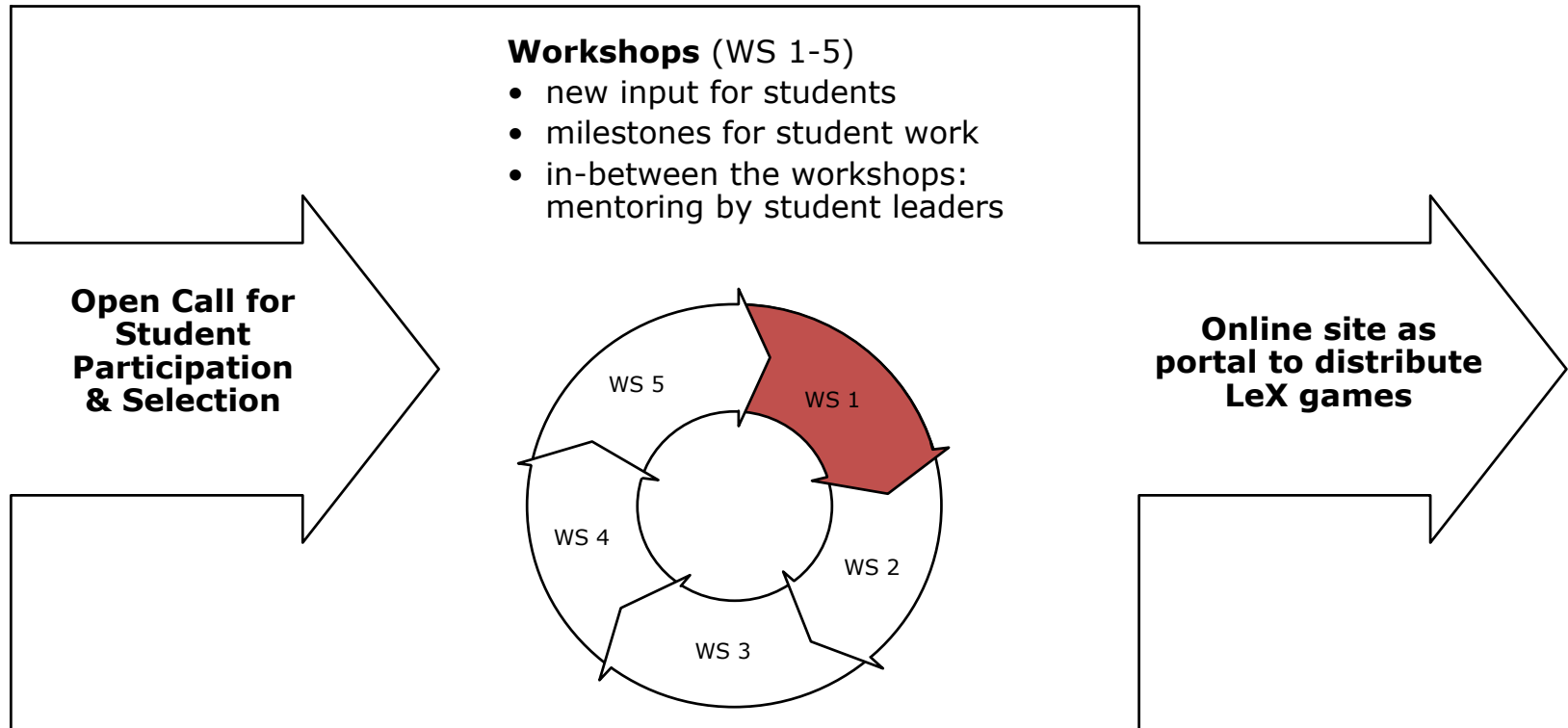
Discover the unseen world around you

- a) Give students opportunity to be in other roles
- b) Human-Centered Design – learning in iterations
 - Students learn to apply the 'design' cycle;
 - Computational Thinking
- c) Transforming learning?
 - Students understanding connections between theoretical concepts and actual physical objects in the material world
 - Allows students to actively explore classroom topics in a new way

This is what we actually wanted to do to, and we also thought we did design for this student experience
BUT... (Lessons Learned later)



Process



Workshops Overview / Timeline



Workshop 1

creating the teams

Decision making on the topic

Starting with story boards, based on
Meaningful Learning With Techn. Approach

August 2017

Workshop 2

ARIS editor and GuidiGo presentation

Beginning of Sept 2017

Workshop 3

introduction into usability/accessibility testing

End of Oct 2017

Workshop 5

Mizzou Game Day event, Awards

Dec 2017

Workshop 4

Goups presenting usability results
and how to improve the prototype

Nov2017



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Communication tools and other services

- Slack channels for communication
- IELab/ Allen Institute in London Hall provided spaces for groups and usability resources



LeXMizzou – Products

location-based AR interactive games with a purpose

<https://lexmizzou.com/>

MizzouHunt

traverses the Mizzou campus answering questions to collect letters: Question of the Month Mystery

Why me?

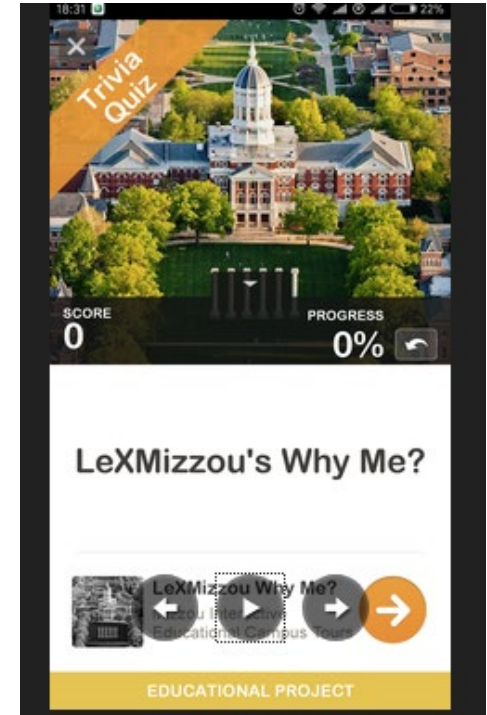
e-guide of MU campus tour - students learn about its history, features and landmarks

LibWay

a library learning experience to promote participation in a library system , e.g., going to the reference desk, understanding call number systems and successfully finding a book.

Ethics Game

navigate through campus, protecting children while also navigating difficult ethical situations, questioning the very nature of right and wrong. Will you make the right choice?



Lessons Learned (1/2)

Theme 1 – Students stuck with ‘one’ platform **vs.** a change to another platform would have enabled them to accomplish their own set goals even better

Theme 2 – Students demanded more structures **vs.** being active agents to shape structures and being persistent

Theme 3 – Students complained about group coordination tools and time restriction **vs.** reality



Lessons Learned (2/2)

Students expressed needs for

more formalized structure, **more** information of game theory, **more** contextual design tools (having more choices to choose from), **more** lab time to learn to use the app

However,

the **more** the course changes towards these student demands, the more it will lose the characteristics of the "co-designer" idea.

We recognize students perceptions and demands, however, we do not suggest changing the basic nature of the course, rather providing student support to make them aware of crucial aspects:

- a) do not get stuck with a platform, be flexible to change the platform,
- b) do not ask for more structures, rather being active agents and shape the structures to meet their needs,
- c) use the group coordination tools and be aware of time restrictions.

→ This is how it works in IT projects – **Welcome to Reality!**



Take away message?



Differences?

How does this teaching/learning approach **differ** from others such as “students as teachers” or project-based learning?

Main difference: **iterative** design thinking

The importance of iterations in learning processes!

‘teach’ students: **iterations**
(iterative thinking/actions)





School of Information Science
& Learning Technologies

The iSchool at University of Missouri

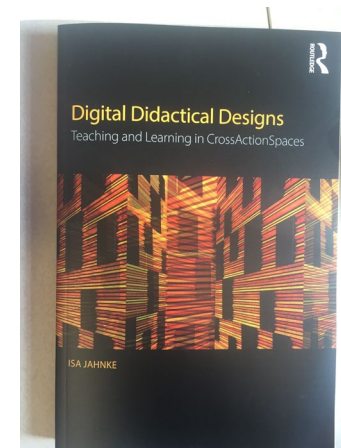
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