

10/26/2018 at AECT2018



Presented by:
Michele Kroll
Michelle Todd
Dr. Isa Jahnke

Co-Designing Games for Learning with Technology

Experience from a Project for Non-IT Students

University of Missouri-Columbia

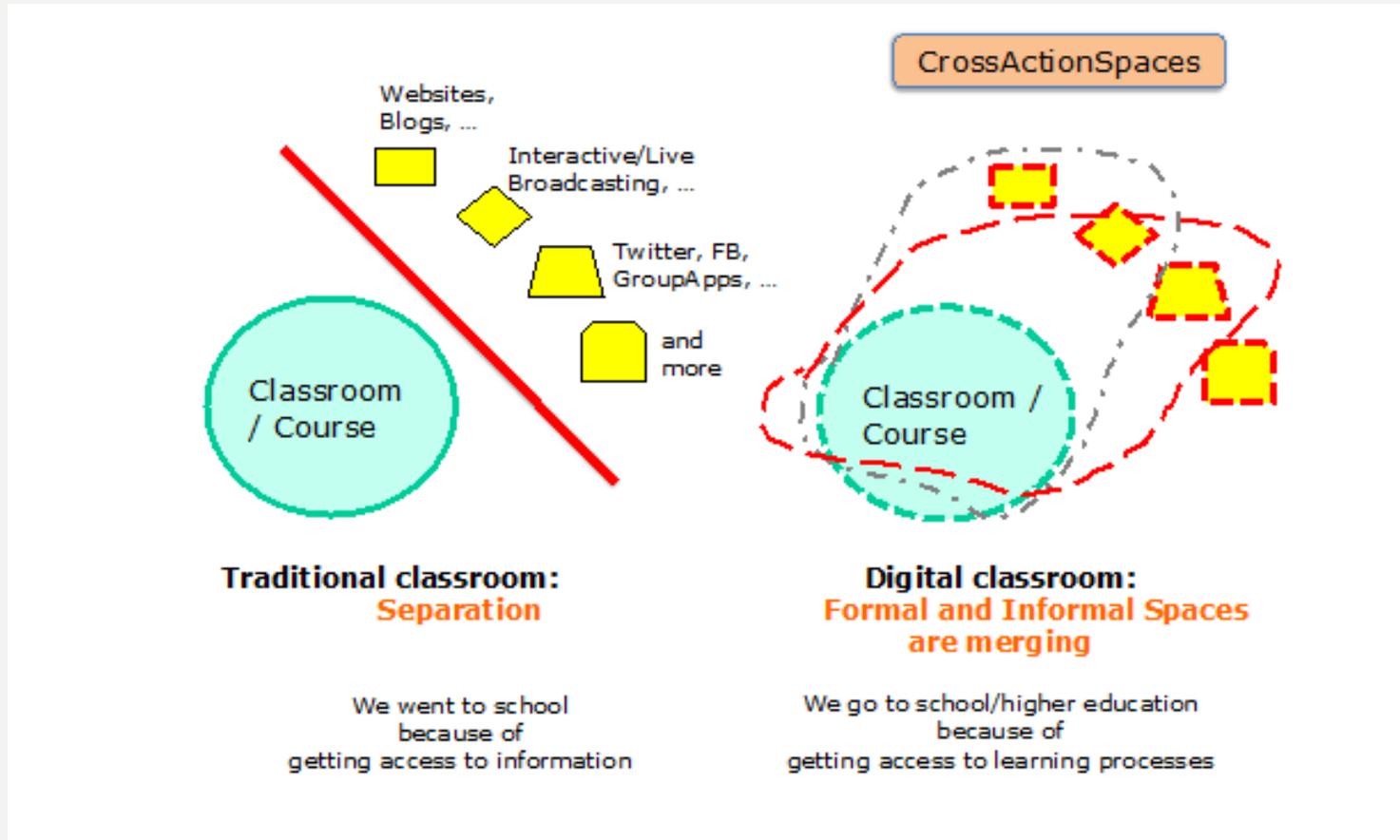


**SCHOOL OF INFORMATION SCIENCE AND
LEARNING TECHNOLOGIES**

RESEARCH PROBLEM: NON-IT STUDENTS, THEY WANT TO DESIGN/DEVELOP GAME-BASED LEARNING

- ❑ New technologies have made it easier to develop new or extend existing apps, even for non-technical people (Francese et al., 2017;Tepper, 2016)
- ❑ However, little is known about how learners outside of Computer Science (CS) or Information Technology (IT) engage in mobile app development (Barr & Stephenson, 2011).
- ❑ We developed an open hybrid course to simulate a real-world iterative IT project cycle with design, development and testing (Buchanan, 1992; Gibbons, 2016).

CHANGE FROM TRADITIONAL TEACHING APPROACHES TO CrossActionSpaces



STUDENT ROLES FROM CONSUMER AND PRODUCER TO CO-DESIGNER OF LEARNING

Student Roles	Description	Example(s)
Consumers of information	Traditional; students are listening, surface learning	Lecture-based, Routine learning
Active, pro-sumers, producers	Teachers design for students to be in active roles (e.g., discussants, collaborative learning)	Learning by assignments focused on problem solving; seminar style
(Co-)Designers of learning	Students are not only prosumers of information but do <i>design</i> their learning, deep learning	Learning expeditions; connecting classroom learning to the world

RESEARCH QUESTION

How do higher education students from Non-IT programs experience the development of an *IT product**** in small groups?

Sub Questions:

What roles do students take on during the project, and do they change?

What do non-IT students perceive as challenges while collaboratively designing the digital game?

--> Does our course design support students to become co-designers of learning? If yes, to what extent and how?

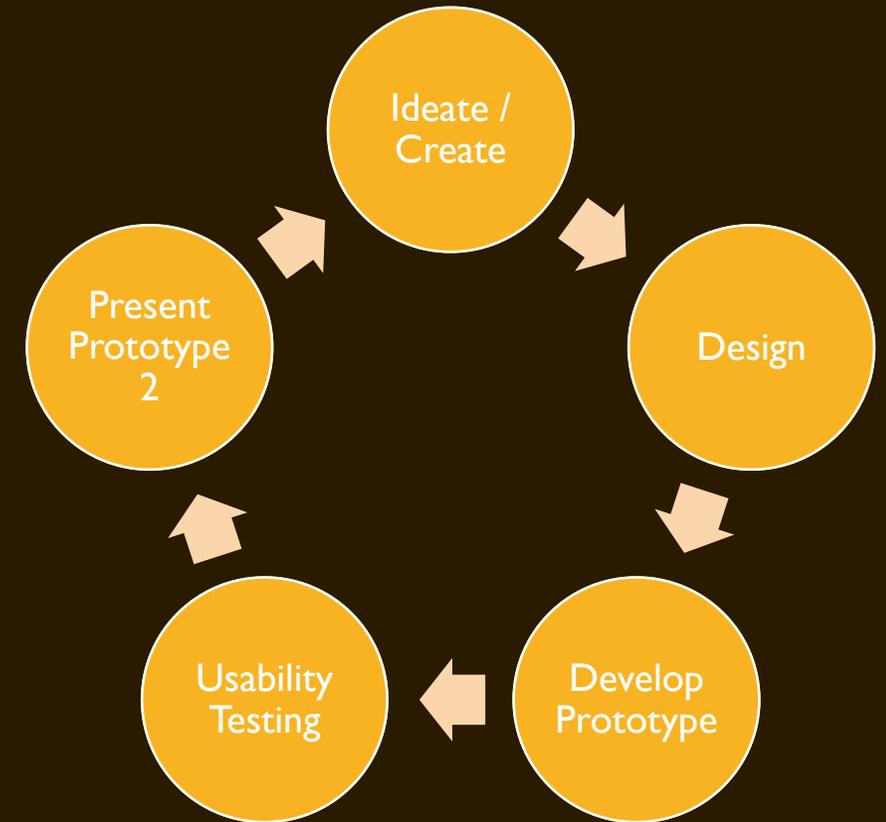
RESEARCH DESIGN:

To answer our research question:
we developed an open hybrid
course to simulate a IT project
cycle with design, development and
testing

(Buchanan, 1992; Gibbons, 2016).

12/3/2018

IT PROJECT CYCLE



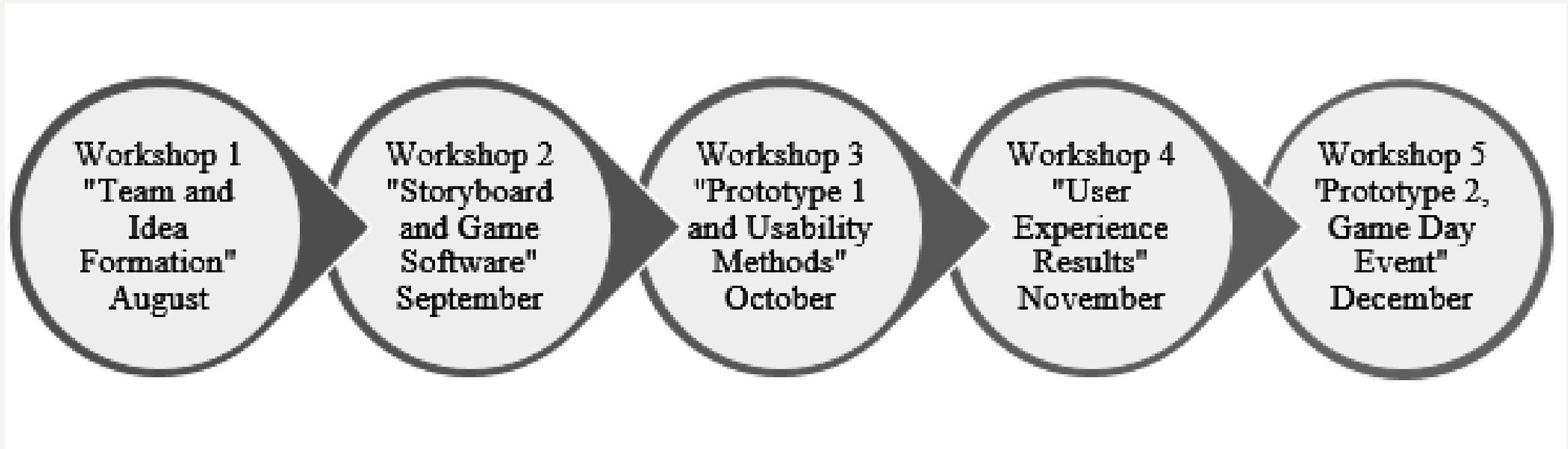
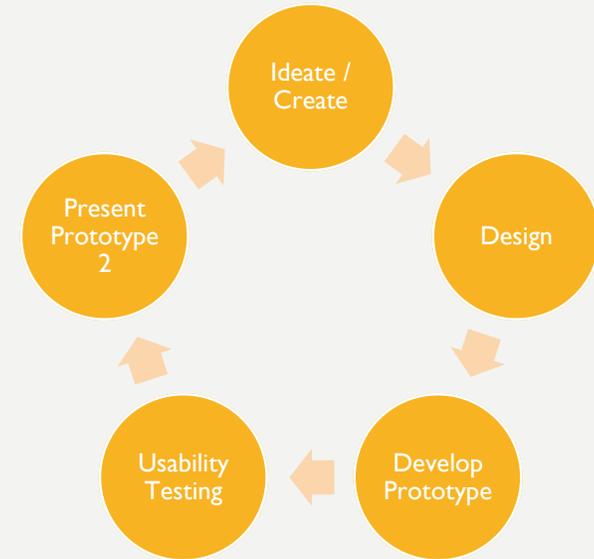
OPEN HYBRID COURSE

- 16-weeks, Fall 2017
- Interdisciplinary groups with 3 to 5 students -- group coordinator chosen
- Project Task: Develop a 'game for learning': interactive, location-based
- Platform choices:
 - Open source platform ARIS
 - Commercialized platform GuidiGo
- Organized along 5 meetings
 - Ideate, design, develop prototype 1, usability testing, prototype 2
 - Coordination in-between: left to students
 - Students used Slack as a communication tool within the teams

CHARACTERISTICS OF PARTICIPANTS

Group	Country	Gender	Undergrad/Grad	Program	Experience with IT projects
1	Vietnam	Female	Doctoral Progr.	Learning Techn.	No experience in IT projects
1	USA	Female	B.S.	Engineering	Limited experience in IT
1	China	Male	B.S.	Computer Science	Limited experience in IT
2	China	Male	Doctoral Progr.	Learning Techn.	Limited experience in IT
2	China	Male	B.S.	Business	No experience in IT projects
2	China	Female	B.S.	Journalism	No experience in IT projects
2	China	Female	B.S.	Nutrition/Fitness	No experience in IT projects
2	China	Female	B.S.	Comm. / Marketing	No experience in IT projects
3	USA	Male	M.S.	Library Science	No experience in IT projects
3	USA	Male	M.S.	Educational Techn.	No experience in IT projects
3	Iran	Female	Doctoral Progr.	Learning Techn.	No experience in IT projects
3	China	Female	Doctoral Progr.	Marketing	No experience in IT projects
4	USA	Female	Doctoral Progr.	Learning Techn.	No experience in IT projects
4	USA	Female	B.S.	Digital Storytelling	Limited experience in IT

WORKSHOP TIMELINE



DIGITAL PROTOTYPES



Word Scramble

Getting to know campus

After completing, users unscramble the final word



Mizzou – Why me?

MU Campus History

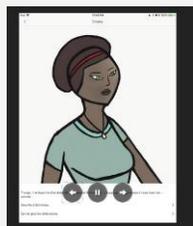
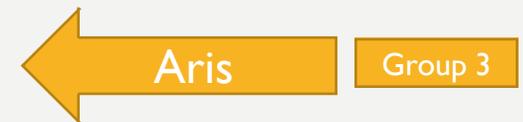
Find clues to understand the campus



Libway

Library

A digital robot helps students to find their way and locate books



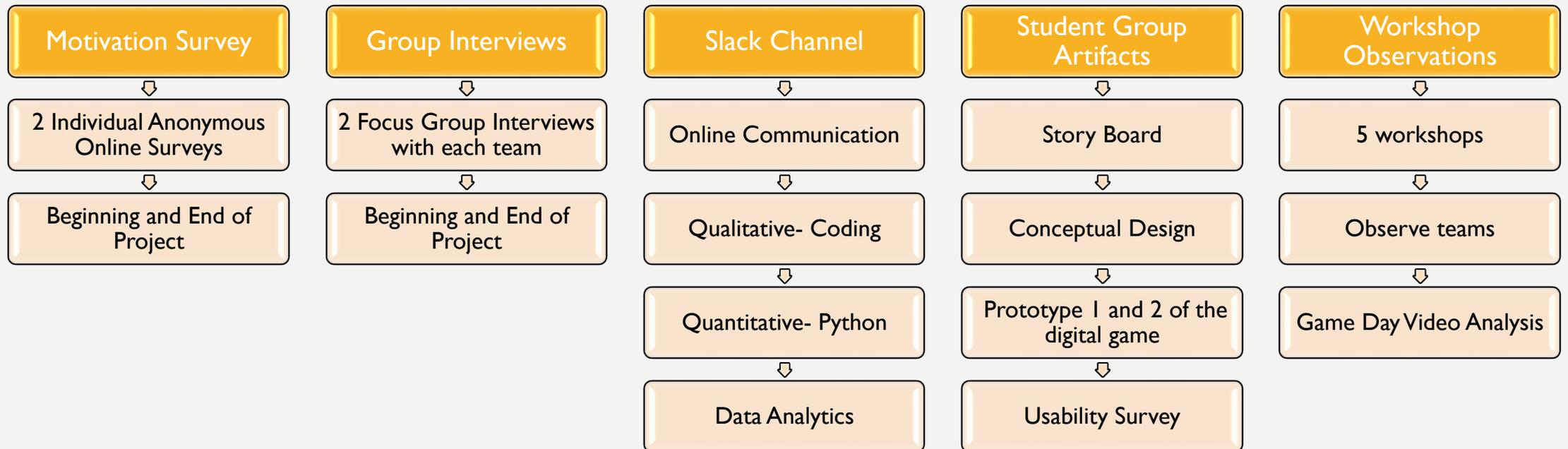
Ethical dilemma

Ehtical theories in practice

AI has taken over campus. Your decisions will effect everyone on campus on this story-based game



DATA COLLECTED



(Merriam & Tisdell, 2016)
(Yin, 2018)

DATA ANALYSIS

- **Thematic Analysis** (Yin, 1989)
- Background: Learning occurs when socially collaborating to construct knowledge; collaborative knowledge creation (Stahl, 2002; Koschmann, & Suthers, 2006, Morch et al, 2015)
- To capture user experience and group interaction, we applied the role theory by Jahnke (2010), four aspects guided our analysis:
 - a) *Roles – Social position of a person (student) within group*
 - b) *Actions – Tasks, responsibilities*
 - c) *Informal/formal and implicit expectations*
 - d) *Interactions, role playing*

RESULTS:

4 GROUPS OVERVIEW

	Group 1 Word Scramble	Group 2 Why Me?	Group 3 Libway	Group Ethics Dilemma
Started with	GuidiGo	GuidiGo	ARIS	ARIS
Roles, Positions (Leader-ship, Active Agents)	<p>Group member was selected to be group leader during first meeting, she had been involved in a similar project in the past.</p> <p>Roles did not change throughout project.</p>	<p>Group leader was established before the first group meeting and stayed constant until the end of the project.</p> <p>Roles and duties were equally divided between all team members for equity of workload while the group leader helped manage the process.</p>	<p>Group leader switched during project; original leader took the role as programmer for prototyping so another member took on the leader role.</p> <p>Group members chose roles based on their strengths and interests (organizing, usability, coding).</p>	<p>One member took on the project manager role and the other member the designer, coder role. One member dropped out after the first meeting.</p> <p>Roles did not change throughout the project.</p>
Actions taken on their own vs. being told by an instructor	<p>Active Agents: The group took the approach of divide and conquer.</p> <p>Utilized conceptual framework and assigned individual tasks.</p>	<p>Active Agents: Generated their own timelines and task documents as a group.</p> <p>Utilized the project management document, idea inventory, conceptual framework and usability guides.</p>	<p>Active Agents: Revised original conceptual framework template that was provided</p> <p>Instructor Led: Group wanted more face to face class instruction/ lab time on using ARIS with an instructor.</p>	<p>Active Agents”: Used project management document, idea inventory and conceptual framework to design prototype.</p> <p>Instructor Led: More help with learning the ARIS platform.</p>
Online/ Virtual Group Coordination	<p>Utilized Facebook and email for virtual meetings.</p> <p>Did not meet much face to face do to schedules.</p>	<p>Utilized WeChat for virtual meetings.</p> <p>Met at least once a week in face to face meetings to review the weeks previous tasks and plan upcoming activities.</p>	<p>Utilized Slack and What’s App to work mainly virtually.</p> <p>Met at least once per month either virtually or physically.</p>	<p>Each worked independently but contacted each other through email to touch base.</p>



4 GROUPS OVERVIEW

	Group 1 Word Scramble	Group 2 Why Me?	Group 3 Libway	Group Ethics Dilemma
Tools for project management	Slack, shared Google Drive with docs and chat.	WeChat, Google Drive.	Slack (more than any other group), What's App, Google Docs.	Slack (seldom), email, Google Drive.
Platform used for Prototype Development	Kept Guidigo. Very dissatisfied with platform. Group felt they missed out on programming opportunities. They did not seek out another platform to meet their needs.	Kept GuidiGo. Group was dissatisfied with the platform and the features and functionality. They did not seek out alternative to meet their needs.	Kept ARIS, added additional coding. Group retained outside resources to help with additional coding for their prototype concept.	Kept Aris. Did not seek out another platform.
Skills Learned	Group felt they missed out on computer programming, did not change platforms even though a demo was given to show each platforms capabilities.	Adobe Premiere, Pro and video editing skills General process of game design and development Project management 360-degree camera	Java script Coding Mobile app design Project Management	Functions of ARIS as a gaming tool and how to use it
Project time constraints	Completed the prototype with original concept design in time.	Changed game stops from 18 to 16 to better support game content/objectives; managed in time.	Redesigned and scaled back original concept to fit into project timeframe.	Group completed a partial prototype. Went with original design idea. Did not adjust their timeframe or design idea.

THREE THEMES

...demonstrate crucial situations for students in which they **experienced a dilemma** between

- what they wanted to do, their ideas or visions **VERSUS**
- the reality, what is actual possible and doable when developing IT products

These are in fact challenges that are common in IT product development.

Theme 1 – Students stuck with their first choice of the platform...

- Although a Change to a New Platform Would Have Enabled Them to Accomplish Their Goals

Theme 2 – Students asked for more structure / facilitation...

- Although the project asked them to create their own structures and instructor encouraged them to asking for help/ support.

Theme 3 – Students struggled with time restriction (e.g., excuses: more time = better quality of the game)

- vs. reality (there is always a time restriction; cannot be an excuse)

IMPLICATIONS ...

- Although students had the opportunity to be in charge of their learning, they still want instructor led activities (not used to being active agents of their own learning)
- Students indicated they needed a more *formalized structure* for certain parts of the course (game design theory, lab time to learn technical platforms)
- Central communication tool (Slack) was important for group collaboration in virtual settings
- Unwilling to change platforms when dissatisfied
- Not able to adjust game content/goals to timeframe as in a real-world IT project scenario

TAKE AWAY MESSAGE

“But you didn’t tell us,
that we could change
the platform

Were the students co-designers?

- No, not yet!
They are active agents but struggled to take agency.

What is needed in courses to help them move from active agents to co-designers?

- Besides the things that we already know, e.g., clear instruction, clear communication (we thought we did) ...
- ...reflect with students in the beginning, middle, and before the end, and apply coaching methods – Ask them: *why did you do it that way, and even more important: why didn’t you do it the other way? You have more options!*

THANK YOU!

IF YOU WANT TO PLAY:

[HTTPS://LEXMIZZOU.WORDPRESS.COM](https://lexmizzou.wordpress.com)