PLAY Minecraft! Assessing secondary engineering education using game challenges within a participatory learning environment

Erin Shaw, University of Southern California

Erin Shaw is a Computer Scientist at the University of Southern California's Information Sciences Institute, a research center at the USC Viterbi School of Engineering. Her research focuses on modeling and assessing student knowledge in the areas of science and mathematics, experimenting with new technologies for aiding assessment in distance learning, and studying computer mediated social dialogue and team collaboration in post-secondary engineering education. She received an MA in Online and Distance Education from The Open University, an MS in Computer Graphics from Cornell University and a BS in Mathematics from Massachusetts State University, Fitchburg. Ms. Shaw has directed research as a co-principal investigator on several National Science Foundation sponsored grants. In 2013, she served as a STEM outreach specialist at the USC Viterbi School of Engineering.

Mr. Minh Tuan La, University of Southern California

Minh La is an undergraduate student at University of Southern California majoring in Computer Science. He was a junior when he wrote this paper, and is expected to graduate in May 2015. He has been interested in the field of Computer Science since high school when he attended Center for Advanced Technologies in Florida. His passion leads him to constantly ponder on how evolving technologies can be deployed to find it's applicable usage. After completing his studies in USC, Minh pursues a career in Software Engineering.

Richard Phillips

Richard Phillips, University of Southern California Richard Phillips is an undergraduate student at the University of Southern California majoring in Computer Science and Business Administration. He was a sophomore when he wrote this paper, and is expected to graduate in 2016. He plans on getting his Masters in Computer Science as part of USC Viterbi Engineering School's progressive degree program in 2017. After graduating, Richard wants to pursue a career in the field of software engineering and eventually management.

Erin B. Reilly, University of Southern California Annenberg Innovation Lab

Erin Reilly is Creative Director & Research Fellow for Annenberg Innovation Lab at USC's Annenberg School for Communications & Journalism. In her role, she oversees all aspects of lab programming, product design and mentoring students in developing applications and business ideas using digital media and how it impacts society. Her research focus is children, youth and media and the interdisciplinary, creative learning experiences that occur through social and cultural participation with emergent technologies.

Erin is currently developing PLAY!, an educational collaboration platform helping learners tap into broad interest based peer communities as well as exploring new forms of reading and writing through dynamic book prototypes. She most recently published her first digital book, Flows of Reading, to inspire educators to reflect on what can be considered as reading and what kinds of reading they perform in their everyday lives.

She was Research Director for Project New Media Literacies at MIT and also has conducted classes as a Visiting Lecturer at MIT's Comparative Media Studies Department and Harvard University's Project Zero Summer Institute. Reilly is a graduate of Emerson College and has her Master of Fine Arts degree from Maine Media Workshops + College. She is a member of the Academy of Television Arts & Sciences, the first-Vice President board member of NAMLE (National Association for Media Literacy Educators) and serves on advisory boards, such as PBS Emmy-award winning Sci Girls. Erin consults with private and public companies in the areas of mobile, creative strategy and transmedia projects.

A ! A

( )

A

PLAY!

(Participatory Learning and YOU!),

PLAY

Science and Engineering Practices

PLAY! Participatory Learning and You!)

PLAY canvas; challenge
canvas

. *Your Turn*

What Do You Think

PLAY

- *creativity*
- *co-learning,*

Next Generation Science Standards

Disciplinary Core Ideas

Science and Engineering Practices
Crosscutting Concepts

Minecraft

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-
-
-
-
-
-
-

Text Processing

Topic Modeling

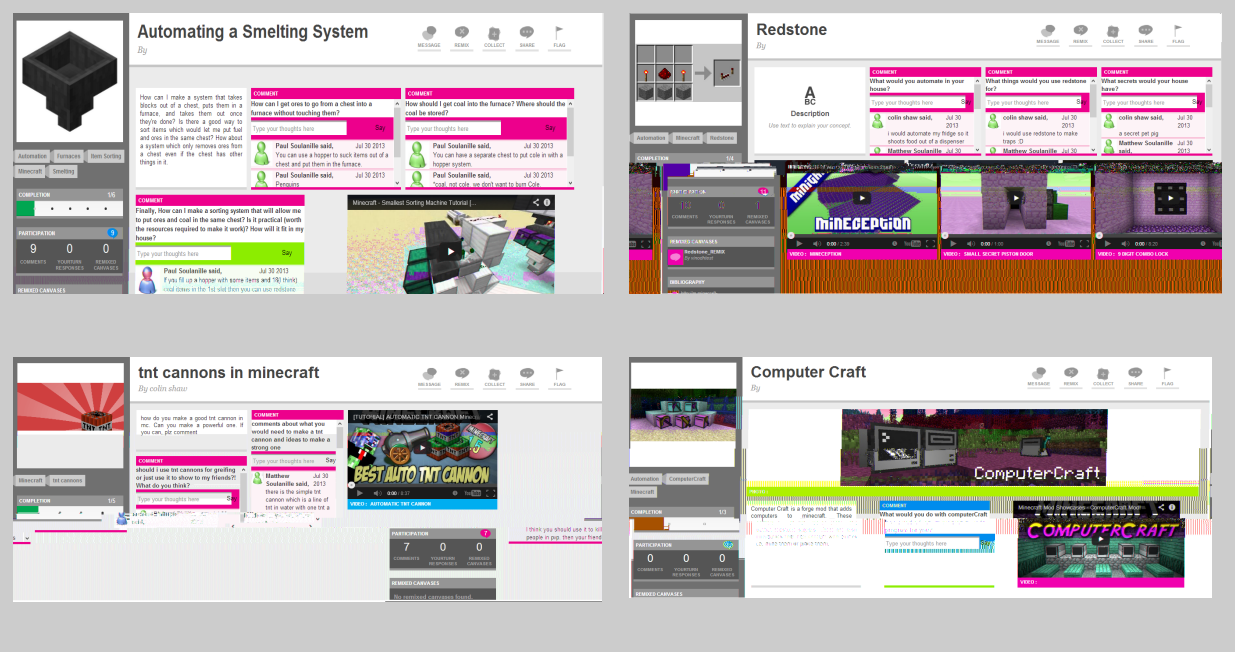
)

PLAY

PLAY

PLAY

PLAY



PLAY

PLAY

PLAY
Was using PLAY! fun? *Why?* *Why not?*
What did you like about responding to challenges? *What didn't you like about responding to challenges?*

What did you like about creating challenges?

What didn't you like about creating challenges?

When you have free time, how often do you spend it playing Minecraft?

How many years would you estimate that you have been playing Minecraft?

Analyzing and Interpreting Data

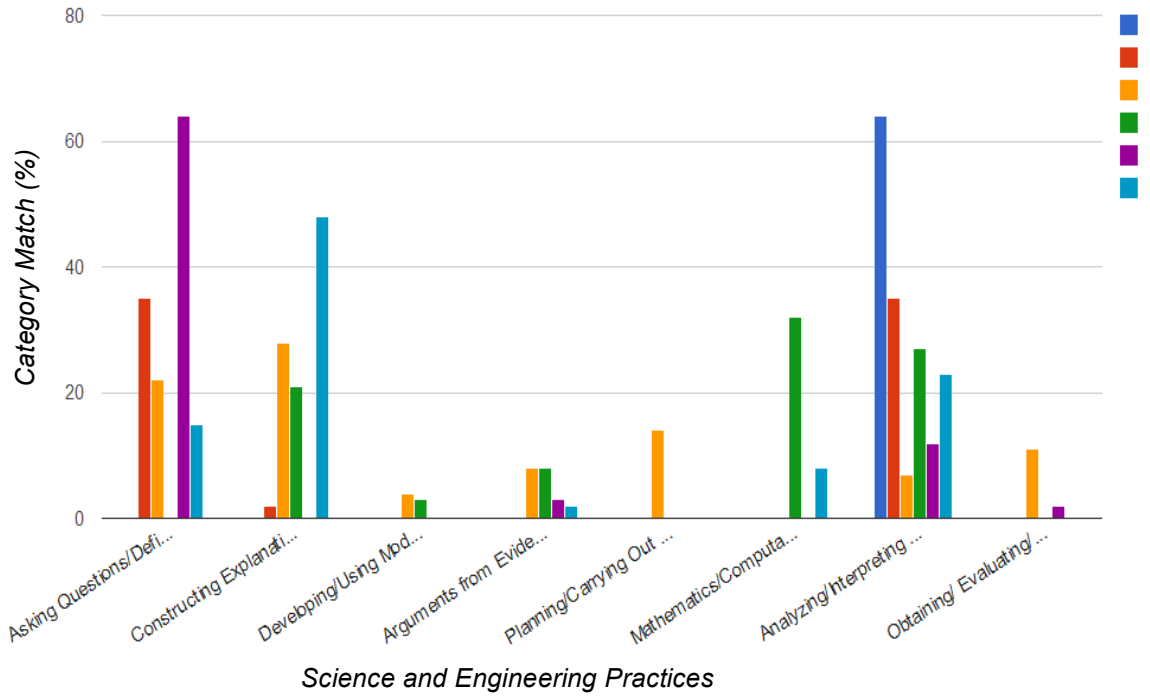
Analyzing and Interpreting Data

Planning/Carrying Out *Obtaining/Evaluating*

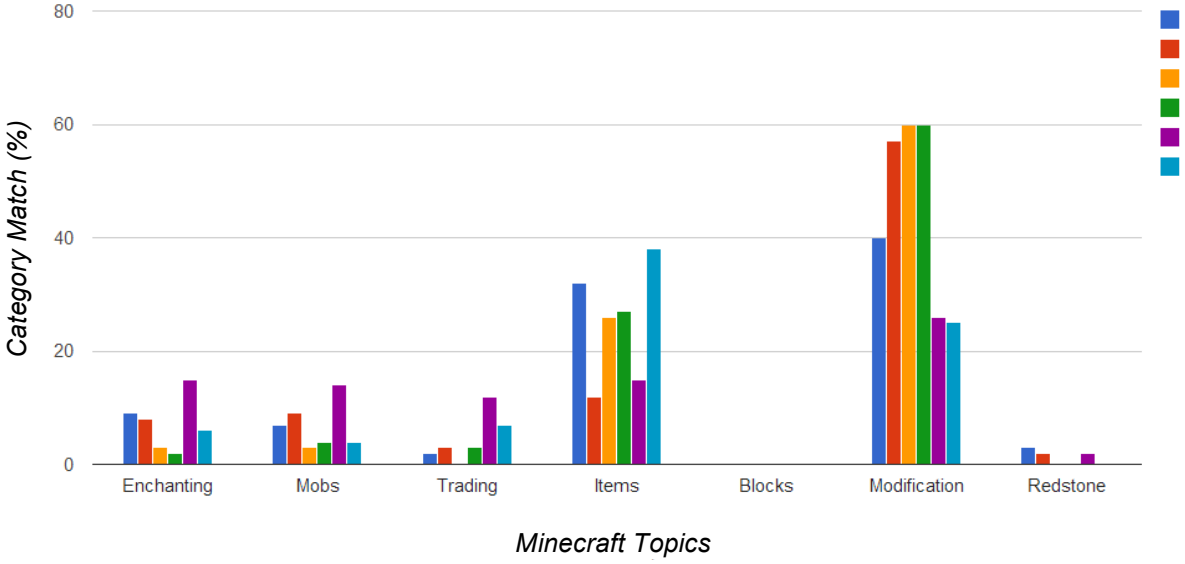
Mathematics/Computation

Asking Questions/Defining Problems *Constructing Explanations* *Analyzing/Interpreting Data*

Student Application of Science and Engineering Practices



Student Application of Minecraft Topics



Asking Questions/Defining Problems
Constructing Explanations

Analyzing/Interpreting Data

you could build this out of …

PLAY

Mods *Redstone*

ground truth
PLAY *Your Turn* *What do you think?*

PLAY

Science and Engineering Practices

PLAY

A

PLAY

B

Shall we PLAY?

ICT: Providing choices for learners and learning. Proceedings ASCILTE Singapore 2007

What the hell is Minecraft and why the hell should you care?

Proceedings of the ACL-02 Workshop on Effective tools and methodologies for teaching natural language processing and computational linguistics - Volume 1

J. Mach. Learn. Res.