Learning, Education, and Families

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Subcommittee and Venues

- CHI subcommittee
  - Subcommittee since 2019, before that “Specific Application Areas”
    - “Interaction Beyond the Individual” (family), “Understanding People”
  - Distinction made between learning and education, and families
- IDC
  - Interaction Design and Children
  - Children-focussed, but with a broad perspective
  - CCI (Children-Computer Interaction)
- Learning at Scale
  - Learning-focused
  - “Innovations in scaling, enhancing, and increasing reach, quality, and equity in learning”
  - Learning does happen in relation with children a lot, but this conference goes beyond learning for just children

Cooperative Inquiry:

Developing New Technologies for Children with Children

For Children By Children

- Using Children as research partners instead of research objects

- Integrational design teams consisting of children, educators, computer scientists, and artists

    Interview procedures, note-taking practices, data analysis, day-to-day team interactions

- Cooperative Inquiry

Since the children picked for the design team are 7-10, how can

we design for children younger than that?

Theoretical Framework

Three aspects of Cooperative Inquiry:

1. Multidisciplinary partnership with children
    a. Cooperative Design
    b. Participatory design
    c. Consensus participation
2. Field research emphasizing understanding context, activities, artifacts
    a. Contextual inquiry
    b. Activity theory
    c. Situated action
3. Iterative low-tech and high-tech prototyping

Three Techniques of Cooperative Inquiry

Contextual Inquiry

- How it differentiates from pure contextual inquiry
- Interactors
- Diagrams and Models

RAW DATA:			DATA ANALYSIS:		
Time	**Quotes**	**Activities**	**Activity Patterns**	**Roles**	**Design Ideas**
39:20	"I want the playing one."	Child clicks on the scared cat and tries to take out another one. It doesn't work.	Difficulty with mouse dragging.		Look for alternative input devices or don't use dragging with a mouse.
39:50	"Awww. The kitten was afraid."	Child clicks on another basket with a cat.	Tells stories about actions on screen.	Storyteller	Offer children storytelling opportunities with technology.
40:20	"Which one's the playful one?"	Child looks for a playful cat.	Child knows what she likes.	Searcher	
41:00	"I don't want to name my kitty."	Child doesn't name her cat when prompted to by the computer.	Child knows what she likes.		
41:30	"That's to give milk."	Child clicks on different icons to see what they do.	Tests out what can be done.	Explorer	Make technology easy to explore.

Participatory Design

- Low-tech prototyping
- "Children and adults must work together. No partner should make all the design decisions, child or adult." (596)

Technology Immersion

- Large amounts of technology over concentrated amount of time

Projects

KidPad

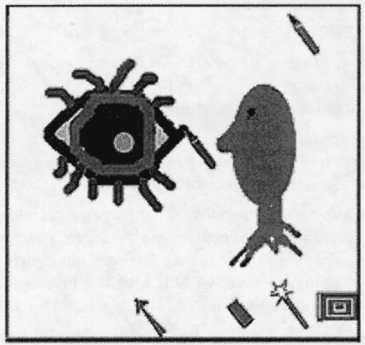


Figure 2: “The Eye”, a story made in KidPad

PETS

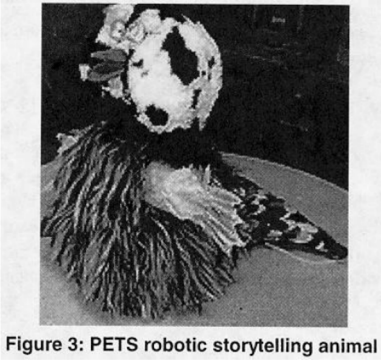


Figure 3: PETS robotic storytelling animal

Both of the case studies described are about storytelling. Can you think of another technology that would benefit from children being part of the research team?

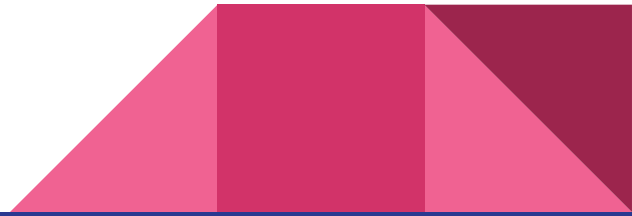
Design-Centered Learning Outcomes

- Learning outcomes that can be related to the Cooperative Inquiry process
- Summary of input from both the adults and children
- five areas of self-reported design-centered learning outcomes

(1) I learned about the design process All team members discussed understanding the technology design process in new ways.
(2) I learned respect for my design partners Both adults and children discussed their mutual appreciation for the work that the other could accomplish.
(3) I learned to communicate and collaborate in a team Children and adults discussed the difficulties and the rewards of learning team communication and collaboration skills.
(4) I learned new technology skills and knowledge All team members mentioned technical skills they had come to learn (e.g., building robots, designing software).
(5) I learned new content knowledge In the case of the team working on the PETS project, children and adults discussed learning more about animals.

Discussion questions

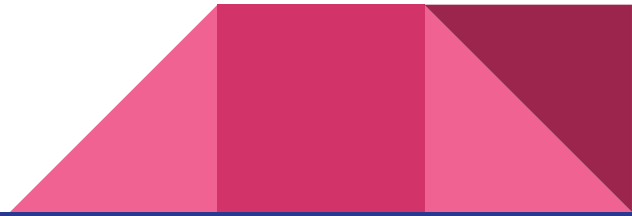
- What kind of contributions did this paper make?
- How do we make the tradeoff between what children want to do/learn vs what they have to learn according to adults?
- What insights can you get from this cooperative inquiry framework when not working with children?



Learner-Centered Design:
The Challenge for HCI in the 21st Century

Overview

- Key argument: We must move from “user-centered” design to “learner-centered” design
- the first wave of HCI: “making computers easier-to-use”
- 3 key questions
  - “Why support learners and learning?”
  - “How might the interface support learners and learning?”
  - “What are the issues involved in providing such support?”



Why support learners and learning?

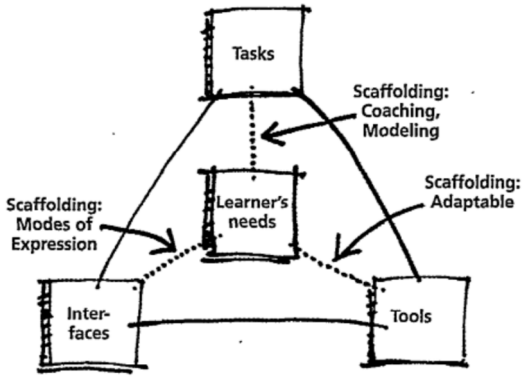
- “There is a clear need to support **students and professionals** in developing their expertise. And, there is a clear opportunity for success”
- “Computers are coming to be used on a moment-by-moment basis for all aspects of work”
- Computers are fit for learning by doing (Constructivist Theory of learning p41 v.s. Didactic Theory of Learning p43)

Is the distinction between the notion of users and learners merely rhetoric or is there truly a substantive distinction being made?

What kind of contributions did this paper make?

Opinion? Theory? Empirical? Artifact?

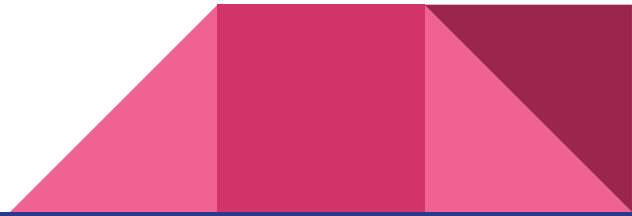
1. Call to action
2. Scaffolding → TILT model
3. Design guidelines (the learning task, learner motivations, diversity, and growth of learners)
4. Two case studies: CAD for Kids and Teachers; GoalPlabCode (GPC) Editor



Discussion questions

- What are differences between human and software scaffolding? Can AI solve the problem? Which one do you prefer?

- What new scaffolding types might arise precisely because we can realize them in software? How learning with software has changed since 1984? (intelligent tutoring systems; multimedia interfaces for learning; systems for collaborative learning …)



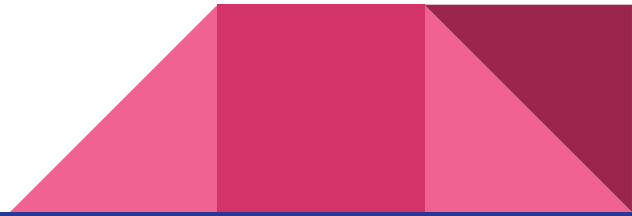
How Video Production Affects Student Engagement:

An Empirical Study of MOOC Videos

Related Work

- Cross. et al. compared Khan-style and PowerPoint slide versions of video lectures
- Ilioudi et al. compared Khan-style and live classroom versions of video lectures
  - on a smaller scale than Guo et al.

- Large-scale analyses of MOOC interaction data
  - Did not include video specifically
- Education research on the impacts of multimedia on student learning



What they did

- Data analysis from four STEM courses on edX
  - video watching sessions
  - Metric: measuring engagement (i.e., time, problem attempt)
  - Video properties (length, speaking rate, video type, production style)
- Interviews with 6 edX staff

Do you think the metrics the authors used for measurement of engagement valid enough?

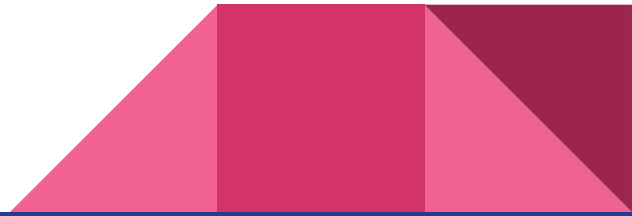
Do you think engagement is a good evaluation of students' learning quality? Any other measurements to evaluate quality of studying with MOOCs? e.g., interactivity (pausing), selectivity (pausing more at specific points)

What kind of contributions did this paper make?

Findings (Empirical)

Design recommendations

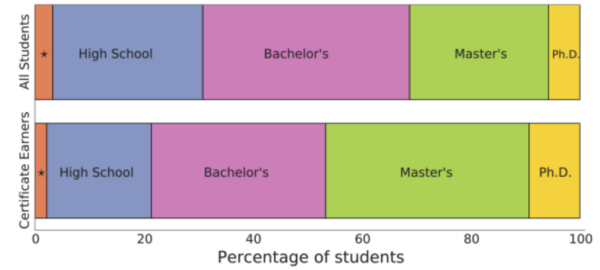
An anonymized public **data set**



7 Design Recommendations

- Shorter videos are more engaging
- Informal talking head is more engaging
- High production value might not matter
- Khan-Style tutorials are more engaging
- Pre-Production improves engagement
- Speaking rate affects engagement
- design differently with lectures and tutorials

6.00x	**PH207x**	**CS188.1x**	**3.091x**
123 countries	133 countries	103 countries	106 countries
U.S. (22%)	India (17%)	U.S. (19%)	U.S. (18%)
India (9%)	U.S. (16%)	India (9%)	India (11%)
Russia (7%)	Spain (8%)	Russia (8%)	Spain (11%)
Spain (6%)	U.K. (5%)	Spain (8%)	U.K. (6%)
U.K. (6%)	Germany (3%)	U.K. (6%)	Russia (5%)
other (50%)	other (51%)	other (50%)	other (49%)



Did any of these recommendations surprise you?

Would design considerations for non-STEM courses be different?

Would design considerations for students who are not self-motivated?

Demographic source: Guo, Philip J., and Katharina Reinecke. "Demographic differences in how students navigate through MOOCs." Proceedings of the first ACM conference on Learning@scale conference. 2014.