

Simulation Interoperability Standards Organization

"Simulation Interoperability & Reuse through Standards"

Workshop theme for 2018: "Leveraging the Power of Simulation"

Enhancing Education Menteeship: Improving On-Line Career Selection for STEM Personnel

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Three Theses

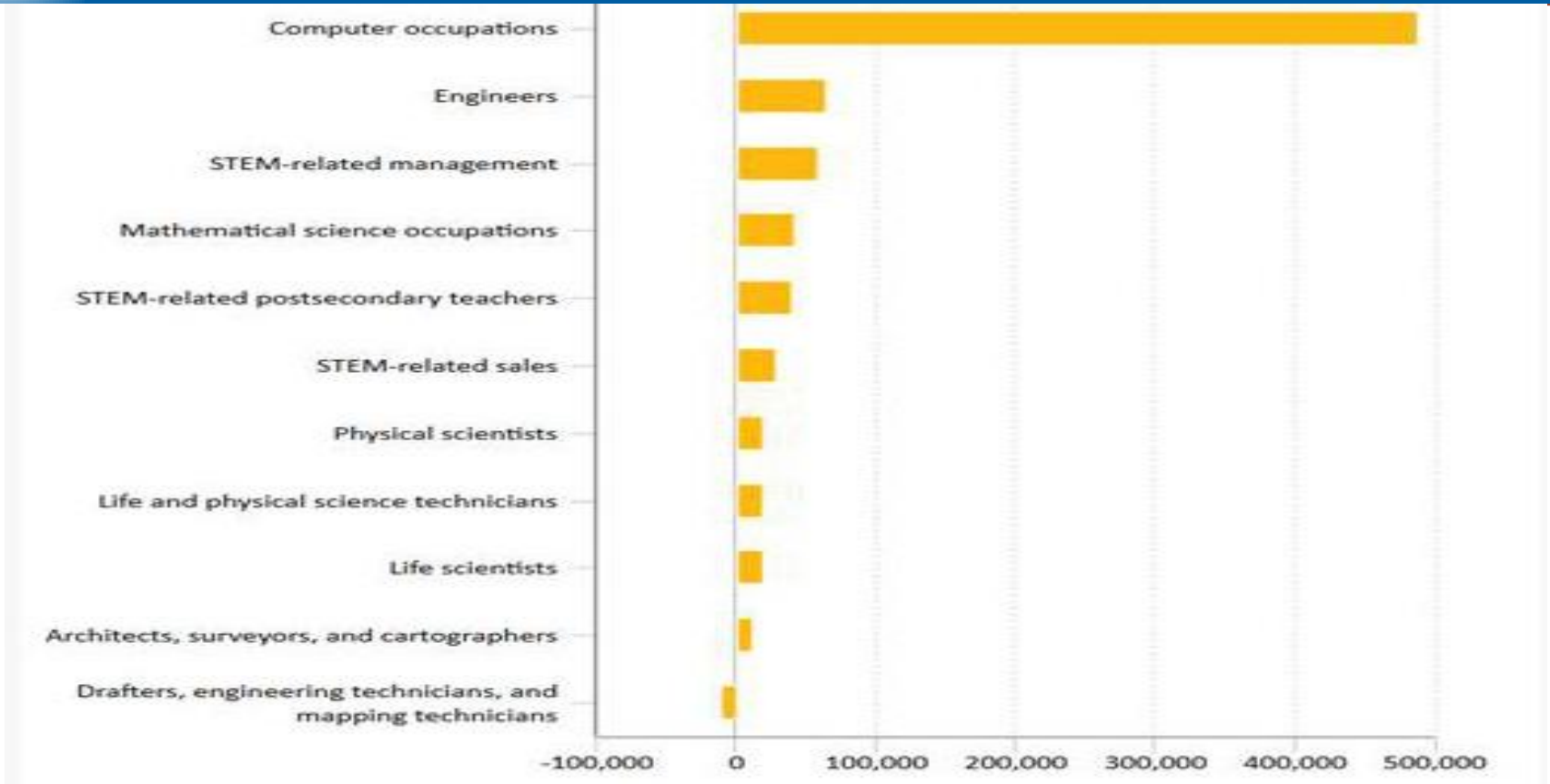
The Authors present three theses:

- The nation has a critical need for more STEM personnel
- There are constraints on academic & career counselors
- New developments in virtual human conversations may help

Needs for STEM Personnel

- **Science, Technology, Engineering and Math (STEM)**
- **Needed for many things:**
  - Economic Strength
  - Military technology
  - Care of Veterans
- **Currently must import many technical personnel**
- **Academia increasingly staffed by foreign personnel**
- **Security concerns may become vital**

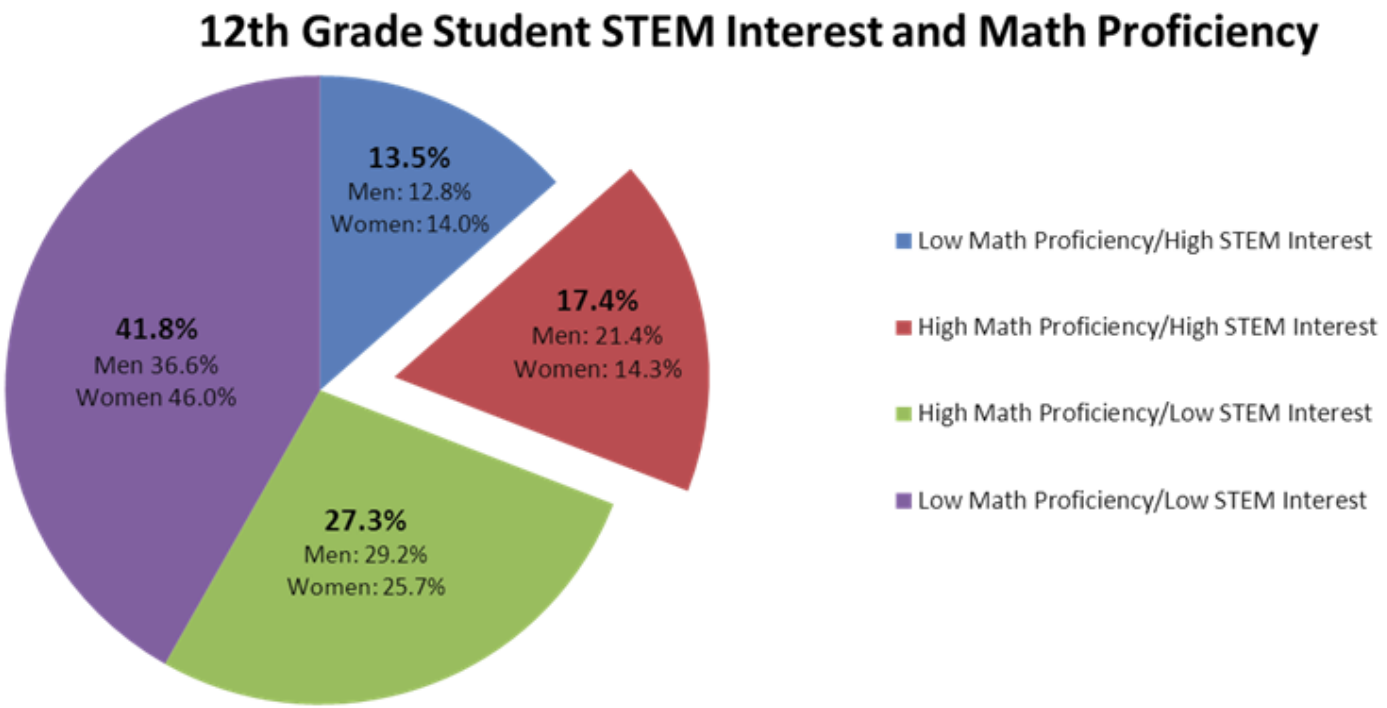
10 Year STEM Jobs: Bureau of Labor Data



Adolescents: Filling the Gaps

- **Lots of emphasis in schools on STEM Subjects**
- **Students faced with many distractions**
- **Two major issues**
  - Misconceptions as to STEM Careers
  - Lack of knowledge of STEM work environment
- **Many students face two pressures away from STEM**
  - Parental preferences
  - Peer pressures
- **Some have dreams, but lack capability**

Two Dimensions: Interest and Proficiency



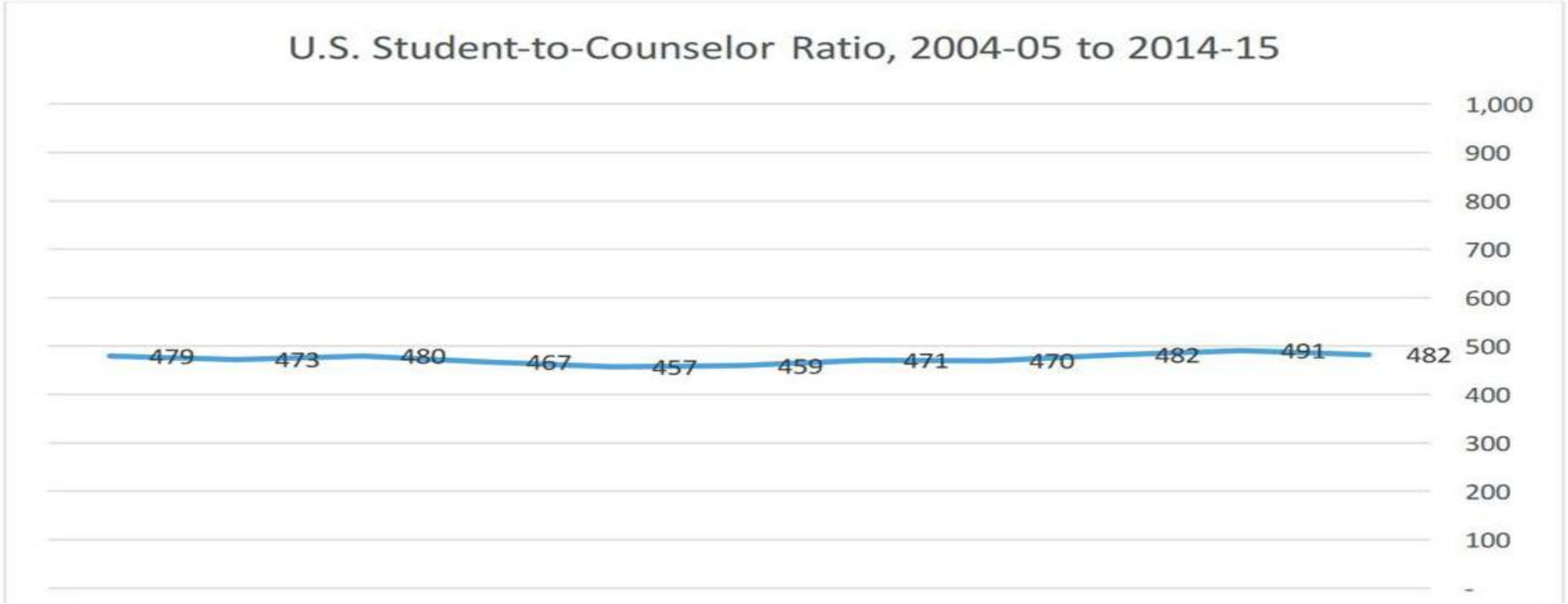
Student Interest in Careers

- Anecdotal data on student population
- Students do not know STEM
- More than that: they don't know career selection
- When probed, they rarely know salient questions
- They often ask peripheral questions:
  - Recreation oriented
  - Income related
  - Entertaining issues
- Parents ask for assistance
- NJROTC has good impact

High School Counselors

- Many variables in staffing skills
- US counselors almost universally
  - Under staffed
  - Over worked
- Anecdotal data indicates few college grads feel they got good counseling
- National association of academic counselors recommends one counselor for every 250 students
- National average 483
- Only four states have under 250; worst = 958

10 Year National Student to Counselor Ratio



Not getting any better!!

How Simulation/AI can Effectively Help

- **Create virtual career mentor**
- **Cf. New Dimensions in Testimony**
  - Documenting the holocaust
  - Emotional responses
- **Experience with Sim Coach**
  - Designed for Veterans
  - Especially useful for PTSD
  - Results encouraging

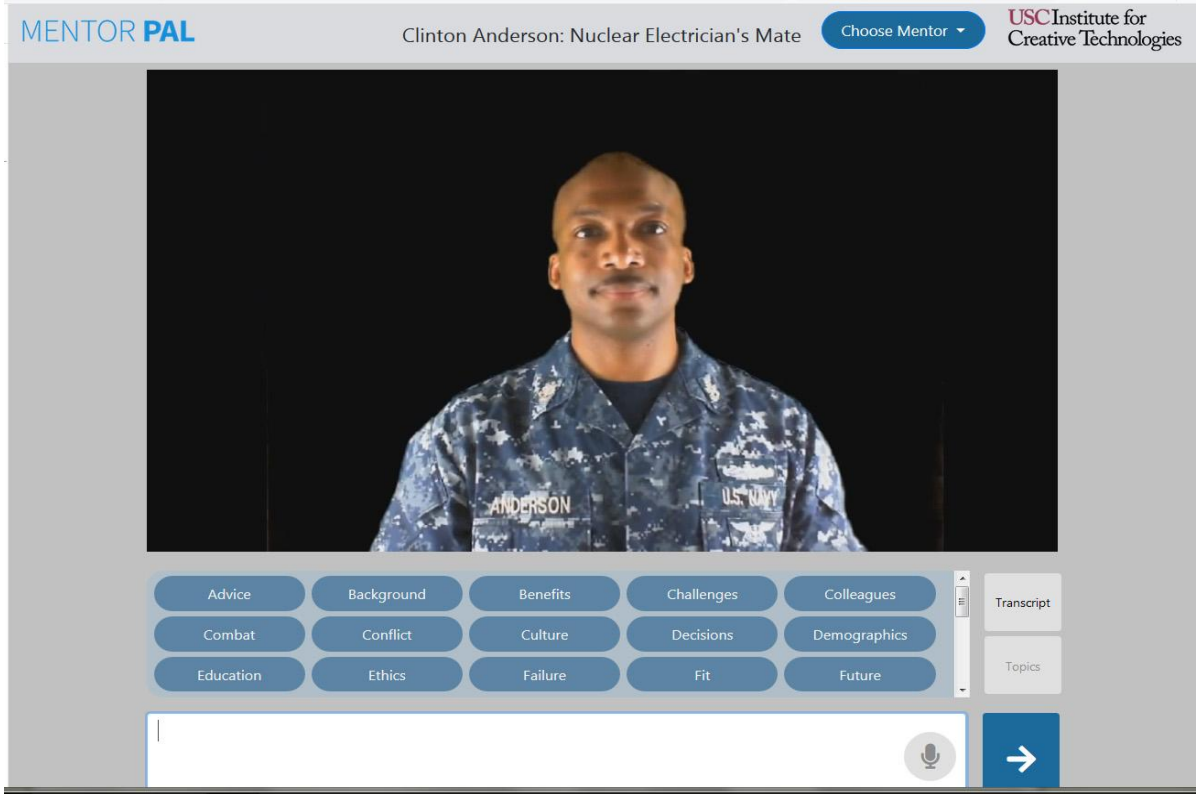




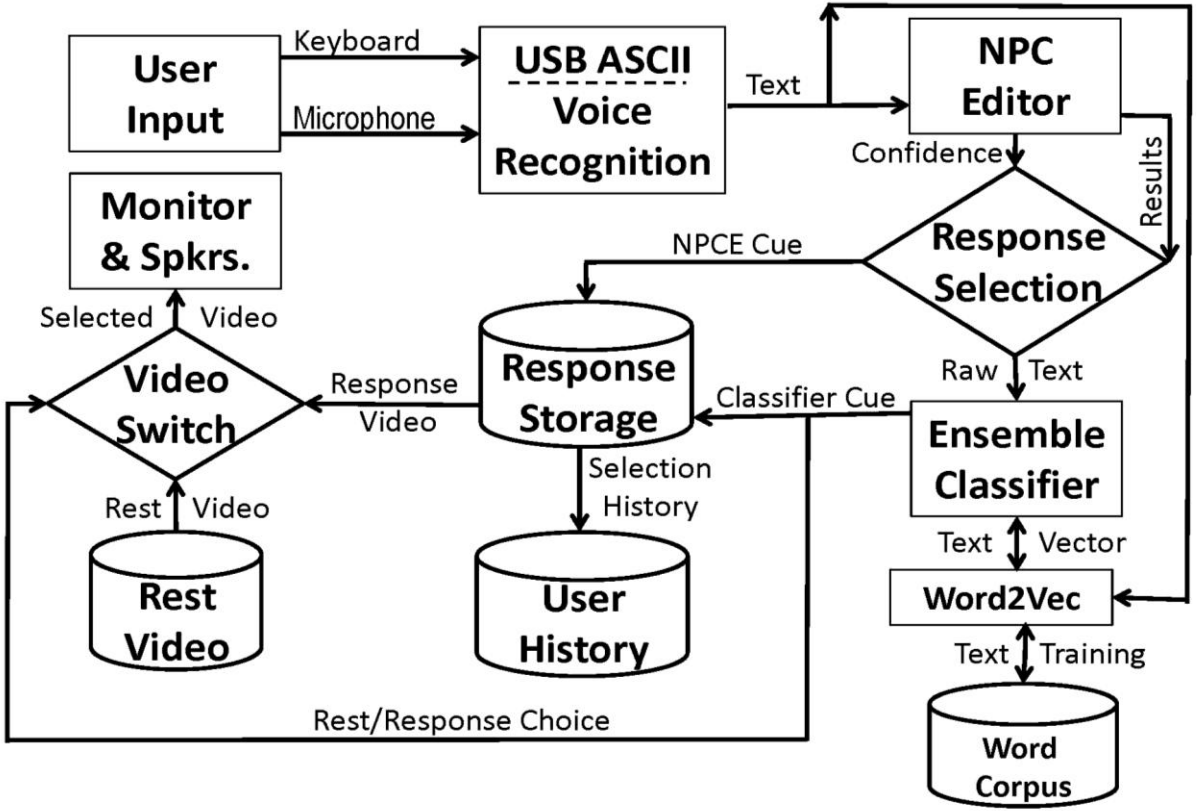
MentorPal Project

- **ONR project to attract more STEM personnel**
  - Uniform
  - Civilian DoD researchers
  - Industry technical personnel
- **Use NLP to select from pre-recorded video clips**
- **Select STEM personnel from uniform and civilians**
  - Vivacious
  - Engaging
  - Narrative skills
- **Goal: conversational virtual mentor**

Laptop Display



MentorPal Flow Chart



Compare Virtual MentorPal with Live Mentor

- **MentorPal now increasingly operational (http: mentorpal.org)**
- **Tested on High School students**
- **Experience interest in MentorPal and Mentor**
  - Students
  - Parents
  - Teachers
- **Several settings**
  - Class rooms
  - Career fairs
  - Professional conferences

Classroom and Career Fairs



Student Reaction

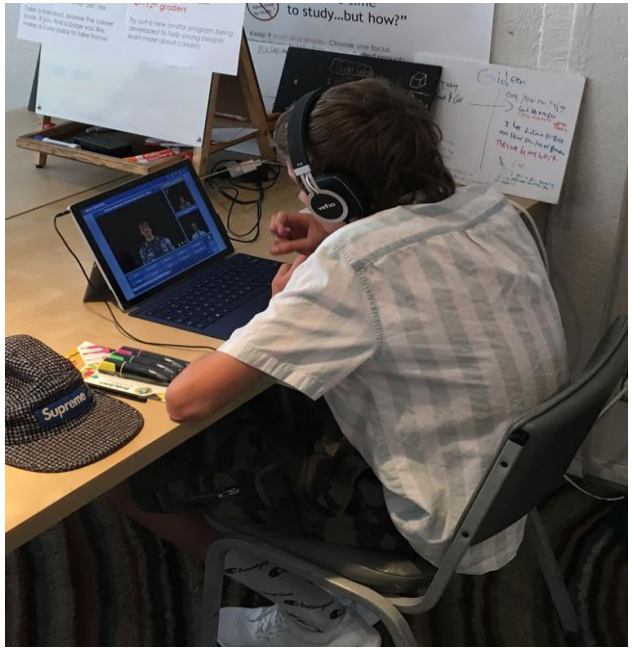
Responses from Users

N = 44

Md=15.6

Age: $\bar{X}$ = 18.6 Gender: M: 27 F: 17 College Major/Career Choice: Mostly STEM

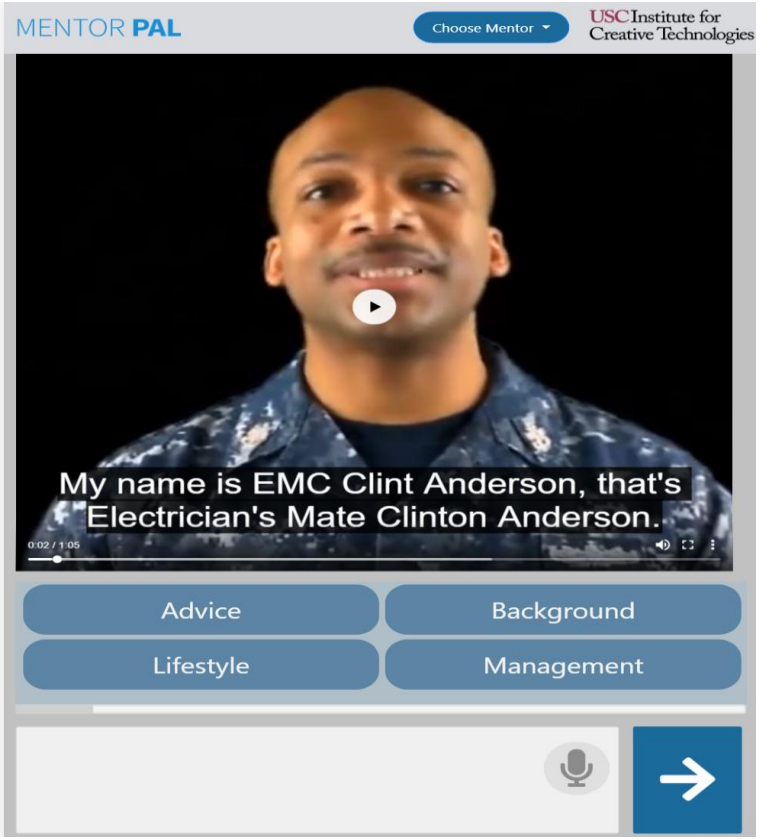
Please Circle the number that best describes how you feel.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I think or worry about my future life almost every day.	4	5	22	6	7
2. Having easy access to better career advice would be useful.	0	0	17	18	9
3. I liked the on-line mentors and learned from them.	0	0	7	26	11
4. The mentor's answers were on-target and useful.	0	0	18	16	10
5. The responses seemed "conversational" and real.	0	0	10	15	19



Porting to Web Application

- Originally required to run on stand alone tablet
- Utility of reaching remote students implied web
- Porting had some issues
- Various platforms
- Size of screens
- Keeping latencies under control
- Required new screen design
- Now working and on-line

Smart Phone Configuration





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QUESTIONS