

CMS.594/894- EDUCATION

TECHNOLOGY STUDIO



SPRING 2019



PROBLEM FINDING

# UNIT 4: NOW WHERE ARE WE GOING?

Unit 4, Final Project: Improving your innovation by...



Learning more about your user's needs



Understanding the education ecosystem in which you are designing in order to maximize your impact

Effectively communicating your innovation and its value to users and stakeholders

# HOW WILL WE GET THERE?

Week 0:

## Reflect

- ★ Review your final reflections from each mini-project
- ★ Complete the final project survey



Week 1:

## Identify a problem

- ★ Identify a problem of practice
- ★ Research existing solutions
- ★ Propose or enhance your solution
- ★ Draft an interview protocol to learn more about your user

Week 2:

## Ideation & prototyping

- ★ Come ready to discuss findings from your user interview
- ★ Come with prototype and playtest protocol
- ★ Conduct playtest

Week 3

## Playtest

- ★ Collect data during class playtest to improve final project
- ★ Practice presentations

Week 4:

## Final Public Presentation\*

- ★ Due: (1) final prototype, (2) presentation slide deck, (3) written product
- ★ Invite 2 guests
- ★ Dress up!



TEACHING SYSTEMS LAB

OVERVIEW OF  
TODAY'S CLASS

# TODAY'S CLASS

- **Part 1:** Discuss this week's readings to learn more about U.S. k-12 education ecosystem to design for impact
- **Part 2:** Identify a problem of practice for your final project & share
- **Part 3:** Draft empathy interview protocols

PART 1:  
THE K-12 US  
EDUCATION  
ECOSYSTEM

# WHAT CAN WE LEARN FROM TWO US ED TECH POLICY REPORTS?

Understanding the **education ecosystem** in which you are designing in order to **maximize your impact**

- How can we ensure we are **designing for impact**?
- How can we ensure we are **innovating** and not just **digitizing**?
- How can we ensure that our proposed solutions don't increase the **“digital divide”** (e.g. [Reich & Ito, 2017](#))?

# THE US NATIONAL EDUCATION TECHNOLOGY PLAN

- Presents a vision for **technology-powered student learning**
- Describes how technology helps **personalize student learning**
- How to embed **technology-based assessments** into learning
- New role for teachers as they act on **insights from data**
- Envisions **learning infrastructure** that provides **access** to people and resources at all levels of ed system
- **Increase efficiencies** in school system (e.g. reduced time on teacher administrative tasks)

WARM UP-  
PROMISES & PERILS  
OF ED TECH

# TURN TO YOUR NEIGHBOR

Based this week's readings, what do you see as the promise and perils of ed tech in the k-16 education ecosystem? Jot it down on paper or in a blank slide in your design journal. Be ready to share with the group.

Innovate, don't digitize!  
What does technology make possible that would not have been possible before?

Source: [USED \(2015\)](#)

ED TECH  
OPPORTUNITIES THAT  
MAXIMIZE IMPACT

# POLICY CONSIDERATIONS AFFECTING DESIGN & LOGISTICS

- Do teachers have the **training** to use your app in the right way?
- How do **privacy** and **accessibility** laws intersect with the features you want to include?
- Who makes the decision to **purchase** your tool, and how long does purchasing take?
- Can your app be equally effective at **school and home**?
- What features are most important to **parents and caregivers**?

Source: [USED \(2015\)](#)

# PROBLEM FINDING: CHOOSING THE BEST OPPORTUNITY

- Opportunity 1: Improving Mastery of Academic Skills
  - Increasing opportunities to **practice core skills** in **authentic environments**
  - Help students **take control of their learning**
  - E.g. [Khan Academy](#), [Dreambox](#)
- Opportunity 2: Lifelong Learning Skills
  - Paper on [growth mindset](#) research
  - “Growth Mindset” [app](#) aims to strengthen students’ academic and **social-emotional success**
  - Self-regulation, behavior management (e.g. [Class Dojo](#))
  - Much to learn from game designers!

# PROBLEM FINDING (CONTINUED)

Source: [USED \(2015\)](#)

- Opportunity 3: Increasing Family Engagement
  - Importance of **involving parents and caregivers of all backgrounds** in learning process
  - US Dept. of Ed. [family engagement resources](#)
  - [PBS Parent Play & Learn](#), [Zero to Three play](#)
  - Lots of opportunities to improve access and engagement through technology!
- Opportunity 4: Planning for Future Education Opportunities
  - Navigating **college application, financial aid, completion**
  - Technology can help students and families make informed decisions, apply, and complete postsecondary education
  - **Lots of room for innovation!** Financial aid navigators, course planners, remote college counseling, college-to-career maps, college course catalogs, [look familiar?](#)

# PROBLEM FINDING (CONTINUED 2)

- Opportunity 5: Designing Effective Assessments
  - Teachers must know what students know and what they are learning
  - **Need for efficiencies**- teachers spend hours reviewing and grading!
  - **Well-designed formative and summative assessments** can provide just-in-time feedback, personalize learning, and adjust instruction
  - **Innovation opportunities** include tools for teachers to share and create formative assessments, automate grading, streamline feedback, more sophisticated test questions (simulations, heat maps, ranking)
- Opportunity 6: Improving Educator Professional Dev't (PD)
  - **Just-in-time** professional, **personalized** learning also benefits educators through teaching tips, access to experts
  - PD should be **job-embedded, differentiated, on-demand** access, align with **adult learning standards** (e.g. growth mindset)

# PROBLEM FINDING (CONTINUED 3)

- Opportunity 7: Improving Educator Productivity
  - **Reducing educator administrative burden** (e.g. preparing lessons, grading, finding teaching materials, grading, reporting, communicating with parents)
  - **Areas for innovation** include tools that help teachers personalize student learning, facilitating feedback to students/parents, tools to create, share, and adapt lesson plans and resources with other educators, make sense of data, track student progress (one example is the Ellevation software)
  - Need for **custom productivity tools** found in other professions

# PROBLEM FINDING (CONTINUED 4)

- Opportunity 8: Making Learning Accessible to All Students
  - **Addressing students' differing educational needs** so that all learners can participate in learning activities
    - **Functionality** (e.g. font size, text read aloud)
    - Address **specific learning needs** (e.g. digital word board)
    - **Personalize learning** to adapt to variety of learner needs
  - Resources: CAST website, National Center for Learning Disabilities
  - Generally content should be **communicated in multiple forms**
  - Features that **customize delivery** must not clutter or confuse
  - **Important note:** Schools will not be able to use your innovation if it is not accessible to students with disabilities
    - See guidance on two civil rights laws, Section 504 of the Rehabilitation Act and the Americans with Disabilities Act

# PROBLEM FINDING (CONTINUED 5)

- Opportunity 9: Closing Opportunity Gaps
  - Unequal access to resources or opportunities (e.g. rural students, less wealthy communities)
  - Technology gaps
  - All students have a right to an equitable education (see [US Dept. of Education Office of Civil Rights Dear Colleague Letter](#))
  - **Innovation opportunities:** tools that make reams of open education resources (OER) easier to sift through, teachers' access to expertise
  - Be mindful of **technical accessibility/connectivity**
- Opportunity 10: Closing Achievement Gaps
  - Relatedly, achievement gaps persist in the U.S. on standardized tests, Advanced Placement (AP) course enrollment, completion, testing (e.g. females and minorities are underrepresented in AP Computer Science)

# PROBLEM FINDING WRAP UP

- Focus on problems that have a significant impact on your intended user
- Which opportunities identified in the [Ed Tech Developer's Guide](#) does your proposed project address?
- After reading the [Ed Tech Developer's Guide](#) and the [National Education Technology Plan](#), what questions do you have for policy experts and government officials?

PART 2:  
IDENTIFYING YOUR  
PROBLEM OF PRACTICE

# BRAINSTORMING FEATURES OF YOUR FINAL PROJECT

1. Problem of practice: state the educational problem of practice where your innovation provides a potential solution
2. Existing solution: how have others addressed this problem?
3. Proposed solution: describe how the proposed extension to your select mini-project can help with the problem of practice in a way that addresses limitations of or adds value to existing solutions.
4. Proposed learning objective: what specific objective should your proposed solution accomplish for the user?
5. Potential user: brainstorm what a suitable context would be for testing your innovation. Who would be the end user? You may suggest specific partners or contexts if it helps conceptualize your innovation.
6. Justification for use of technology: Why is your medium the optimal one?

# ADDITIONAL RESOURCES

- Identifying existing solutions
  - **App Review Websites:** [EdTech Index](#) (by EdSurge), [Graphite](#) (Common Sense Media)
  - See how crowded certain spaces are (e.g. Math, ELA)
- Evaluating what works
  - Institute of Education Sciences [What Works Clearinghouse](#)
- ...and what might not work
  - [New York Times article](#) on web-based personalized learning, Summit

BREAK - PLEASE RETURN IN  
10 MINUTES

PART 3:  
DRAFT AN EMPATHY  
INTERVIEW PROTOCOL

# IDENTIFYING A USER/STAKEHOLDER TO INTERVIEW

How can you identify interviewees that will help you design a solution for everyone?

"Your solution must manifest your deep understanding of educators' daily struggles and small victories. That understanding is the beginning of empathy, without which you cannot succeed."

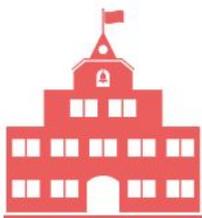
-Stevn Hodas, former Executive Director of Innovatate NYC Schools

# WORKED EXAMPLE: SCHOOL REPORT CARD DESIGN CHALLENGE

- Problem of practice: How can states design family-friendly approaches to school “report cards” that make school data more transparent and accessible?
- Existing solutions: This information is a key resource to helping parents and communities understand how their school is performing, evaluate what is working and what needs to change, and drive changes that help kids succeed. Yet, few current report cards are not accessible to the public. What do you think about Massachusetts’ school report cards?
- Which award-winning report card is your favorite design?

# WHO ARE THE STAKEHOLDERS? WHO ARE THE USERS?

1. Who are the experts you might interview?
2. Who are the extremes and mainstreams?
3. What questions might you ask them?



Teachers



Policymakers



Administrators



Teacher preparation  
professionals

**Who is  
missing?**

# WORK TIME

Develop an empathy user/  
stakeholder interview  
protocol due Friday @5pm

Interview must be conducted  
by start of class.

“...we’ve since realized a  
problem with personas.  
They are inherently an  
amalgamation, an average  
of attributes that we  
imagine our average  
customer has. And there’s  
no such thing as the  
average customer.” -  
Microsoft Design

# HOMework

Assignment due by Friday: Stakeholder interview protocol:  
Design an interview protocol based on the examples provided in class to conduct with (1) an expert in the field who directly understands the needs of your end user; or (2) interview extreme users and those in the middle or “mainstream” of your target audience.

**Where to submit:** Upload to the course website.

PREPARING FOR THE  
NEXT CLASS

# DUE BEFORE NEXT WEEK'S CLASS

1. Conduct your stakeholder/user interview (take field notes or record it - with permission from interviewee)
2. Report on following elements in your design journal and come ready to share
  - a. Interviewee
  - b. Key takeaways
  - c. Design refinements
  - d. Potential roadblocks

# FINAL PROJECT RESOURCES

1. Interviewing tools
  - a. Voice transcription: <https://otter.ai/login>
  - b. Ideo resources: <http://www.designkit.org/methods>
2. Examples of writing in different genres (coming soon)
  - a. Stakeholder/funder pitch
  - b. Conference proposal
  - c. Policy brief
  - d. EdTech news article
  - e. Infographic

WRAP UP

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