Virtual Coach Design Document and Presentation

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Statement of Need

      1 in 20 public school students in New York City is homeless (ICPH. "An Unstable Foundation: Factors that Impact Educational Attainment among Homeless Children," Retrieved from http://www.icphusa.org/index.asp?page=16&report=116&pg=121). Students who are homeless and are staying in different places different nights struggle especially in school. These students often don't have a good environment to study, and also may be switching schools and will miss out because the schools are teaching different curricula. Also, teachers may not know which students have moved frequently, or are experiencing homelessness, and even if they do, they may not know how best to support those students, or don't have the resources to give them the attention that they need, particularly if there is a large number of homeless students at the school.

Target Audience: 6th-8th grade students in New York City with unstable housing

Goals:
- Impact Goal:
    - Help students with unstable housing do better in school, not repeat grades
- Learning Goals:
    - Students will learn to advocate better for themselves.
        - Students will be able to identify resources (people, places, programs, etc) that can help them get support they need.
    - Students will be more self-aware learners.
        - Students will learn effective study strategies.
        - Students will be able to identify studying/learning strategies that are particularly effective for them personally.
        - Students will be able to articulate their own learning styles, strengths and weaknesses.

- Students will be able to identify environmental factors that help them learn and will feel comfortable seeking out spaces that are conducive to learning/doing homework and/or working to modify spaces to better suit their needs.

Interviews

School of the Future- Brooklyn is a new middle school that serves a low-income population in East New York. Their students were on vacation this week, so I spoke with the founding principal and a teacher there. It sounds like it will be possible for me to interview some of their students at a later date.

Interview Questions:
- How would you describe the population of kids at your school?
- What is School of the Future- Brooklyn's mission?
- How do students get into your school?
- Do you have many kids who come partway through the school year or leave partway through because they move to a different district?
- How many of your students, roughly, don't have a consistent place they're staying/living at?
    - How do you identify them?
- What structures are in place currently (at your school or broadly), specifically to support/identify kids who have unstable home situation?
    - What other ways do you try to support those students with housing instability?
- What kinds of needs do you think they have more specifically than other students at your school?

Interview #1:

2/15/15, 3pm, in person

Rachel Fischhoff, reading teacher at School of the Future- Brooklyn

- Many of their students come to the school 2-3 years delayed in reading/math (also emotional) levels
  - roughly 40% have IEPs
- School's mission- progressive education in public school
  - big focus on problem solving
  - independence
  - making choices
  - apprenticeship
- lots of chaos, instability of different kinds in most of their students' lives
  - may have other relatives, parent's friends living at their house (if not in temporary housing themselves)
  - may be switching homes due to custody agreements
  - parents/guardians may not know how to get them enrolled
  - leads to lots of "material confusion" with kids
  - more chaotic at home may mean very good attendance (because school is a better place for them to be)

Interview #2:

2/16/15, 12pm, via Skype

Sarah Kaufmann, founding principal of School of the Future- Brooklyn

Main Points:
- social and emotional support is crucial
- one of their founding tenets is each student has a coach

- ○ coach is a teacher
- ○ same coach for all years at the school
- ○ meet weekly, 15 minutes with the coach
- ○ plan upcoming week, reflect on previous week
- school is space to mess up, be a kid
  - ○ many low income students have substantial fear of failure, so don't try things
  - ○ make school a place where they can make mistakes and see that it's ok
  - ○ many older/oldest siblings act out emotionally a lot more at school than elsewhere, since it's the only place they get to just be a kid (may have to care for younger siblings, etc. outside of school)
- hard to identify kids who have unstable housing
  - ○ hypothetically, guardians identify that at the beginning of the school year, but may not choose to for a variety of reasons, or circumstances may change over the course of the year
- not a lot of good support systems exist right now
- "the system" seems to think that all they need is school supplies and clothes, she'd prefer they had similar provisions to special ed. kids
- hard to negotiate the system (ex. IEPs don't cross state lines)

Landscape Audit

Title I — Improving The Academic Achievement Of The Disadvantaged:
http://www2.ed.gov/policy/elsec/leg/esea02/pg1.html

    Title 1 of the Elementary and Secondary Education Act is a means of distributing federal funds to schools with low-income students. It's a well-intentioned act to help support students with a variety of needs, including those with unstable housing. It'll be useful to understand the various ways this impacts schools and students. I should also keep it in mind in case I can make my project eligible to be paid for by these funds, since there are limits on how schools and districts can use this funding.

U.S. Department of Education

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LAWS & GUIDANCE / ELEMENTARY & SECONDARY EDUCATION

Title I — Improving The Academic Achievement Of The Disadvantaged

SEC. 101. IMPROVING THE ACADEMIC ACHIEVEMENT OF THE DISADVANTAGED.

Title I of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq.) is amended to read as follows:

TITLE I--IMPROVING THE ACADEMIC ACHIEVEMENT OF THE DISADVANTAGED

SEC. 1001. STATEMENT OF PURPOSE.

The purpose of this title is to ensure that all children have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at a minimum, proficiency on challenging State academic achievement standards and state academic assessments. This purpose can be accomplished by —

(1) ensuring that high-quality academic assessments, accountability systems, teacher preparation and training, curriculum, and instructional materials are aligned with challenging State academic standards so that students, teachers, parents, and administrators can measure progress against common expectations for student academic achievement;

(2) meeting the educational needs of low-achieving children in our Nation's highest-poverty

Vroom: http://www.joinvroom.org/

      Vroom is an app and set of resources to help parents understand easy ways they can engage their toddlers and infants to help with crucial early brain development, and also to help them understand the science behind that. Even though it's not specifically addressing my problem, it's well designed support for parents. It has concrete tips and steps, and incentivizes them in the app in a variety of ways. It also makes me think about how much I should think about parents in working on my project.

Reading on the Go!, Vol. 2: http://center.serve.org/nche/downloads/reading_on_the_go2.pdf

Discusses the implementation of a reading program specifically targeting high mobility students.
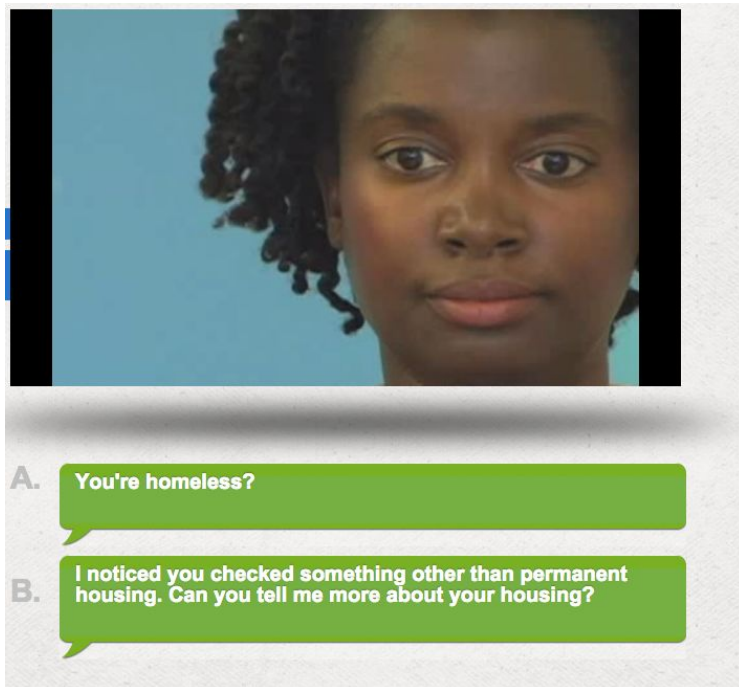
NYS TEACHS video simulation:

NYS TEACHS is an organization that helps with the actual implementation of the McKinney-Vento Homeless Assistance Act (which provides funds to support the education of homeless students). They have a variety of resources for teachers and parents, and also offer trainings and workshops.

They also have this choose-your-own-adventure style video simulation on being sensitive towards families experiencing homelessness:
http://www.nysteachs.org/materials/Simulation.html

Children's Aid Society HOPE Leadership Academy:

http://www.childrensaidsociety.org/hope-leadership-academy

This is a program focused on giving youth a space to discuss and process their emotions and experiences. This kind of student-focused emotional support seems particularly important for youth with lots of transition in their lives.

Literature Review

Kaplan, S., & Valenti, C. (2005, June 1). Moving Forward, Helping New York's high mobility
students to succeed. *Education New York*.
http://www.educationnewyork.com/pdfs/ednystudentmobility.pdf
- focuses on NY students
- lists fairly concrete changes that schools could make to help high mobility students

Unstable Living Situations and Early Childhood Mental Health. (2010, January 1). Retrieved
February 17, 2015, from http://www.ocd.pitt.edu/Files/PDF/ECMH-unstableliving.pdf
- reviews a variety of research
- students don't need to fit definition of "homeless" to have unstable living
conditions (caretakers, people who live with them, etc.) that will result in similar
problems

Voight, A., Shinn, M., & Nation, M. (2012). The Longitudinal Effects of Residential Mobility on
the Academic Achievement of Urban Elementary and Middle School Students. *Educational
Researcher* , *41* (9), 385–392. doi:10.3102/0013189X12442239
- math and reading impact of changing housing situations, grades 3-8
- recommendations for improved practice

Concept Brief

      1 in 20 public school students in New York City is homeless (ICPH. "An Unstable Foundation: Factors that Impact Educational Attainment among Homeless Children," Retrieved from http://www.icphusa.org/index.asp?page=16&report=116&pg=121). Students who are homeless and are staying in different places different nights struggle especially in school. These students often don't have a good environment to study, and also may be switching schools and will miss out because the schools are teaching different curricula. Also, teachers may not know which students have moved frequently, or are experiencing homelessness, and even if they do, they may not know how best to support those students, or don't have the resources to give them the attention that they need, particularly if there is a large number of homeless students at the school.

      Virtual Coach is, as its name implies, a virtual learning coach (mobile and browser-based) app to help provide some consistency and also help students learn skills to be better independent learners. Virtual Coach will be based some on the existing framework of the open source app/service HabitRPG. The game framework of it incentivizes habits like setting weekly goals (regardless of whether they're achieved), recording homework assignments, estimating time it takes to complete a task, and also reflecting regularly on all of these and other activities.

      The learner creates an avatar, who has a certain amount of health. Damage is done to the avatar if the learner ignores tasks like writing down assignments or setting goals. As the learner completes those tasks, they gain experience points (XP). When they gain a certain number of XP, their avatar levels up. As with many other games, the amount of XP required to level up

increases with each new level. The mobile version of Virtual Coach will also have reminders to help the learner remember to complete different tasks.

Virtual Coach also has quests that learners can choose to embark on. The quests each have a different focus. For instance, the New School Quest, is intended to help a student adjust to switching schools midyear, something many students with unstable housing situations experience. This particular quest includes tasks like "Ask a teacher how you can find out what assignments you'll have each week" since some teachers have the week plan posted someplace physically or online, and a student might not know where if they joined the class late. There is also a place for the student to record information and reflections they have on completing the task (e.g., "The bulletin board always has the week plan for Science class" or "Mr. O'Connor seems really nice and offered to explain the new homework to me after class"). The quests would each have a different in-game challenge overall (e.g., fighting a dragon). Completing the tasks in the quest would defeat that challenge, and defeating that challenge would get them special rewards like rare items for their avatar to wear, in addition to the XP and gold from completing the individual tasks and reflections.

> "To develop the expertise needed for lifelong learning, we argue that students need to reify, reflect on, and improve their cognitive, social, and metacognitive processes. Introducing software advisors that incorporate models of such processes has the potential to facilitate students' sociocognitive and metacognitive development." (p. 1, White, et al., 2002)

The reflections, as well as predicting time for tasks (and reflecting on how accurate the predictions were) are all based on ideas for developing metacognitive skills and awareness (Schraw, 1998). These skills will help students become more self-sufficient learners, which can help them to rely less on the unpredictable infrastructures in their environments.

References:

Schraw, G. (1998). Promoting general metacognitive awareness. *Instructional science*, *26*(1-2), 113-125.

White, B. Frederiksen, J., Frederiksen, T., Eslinger, E., Loper, S., Collins, A. (2002). <u>Inquiry Island: Affordances of a multi-agent environment for scientific inquiry and reflective learning</u>. In P. Bell, R. Stevens & T. Satwicz (Eds.), *Proceedings of the Fifth International Conference of the Learning Sciences (ICLS)*. Mahwah, NJ: Erlbaum.

Context Scenario

Diego gets up early at 7:20am on Monday and makes some toast, and spreads some jam on it. He eats breakfast very fast. Then he gets ready to go to school. He went out of home surreptitiously to avoid waking the other relatives up. He gets to school on time, and at 8:00, his first class-- literature begins. The topic is Uncle Tom's Cabin, he stays quite focused on teacher's narration, he doesn't feel like reading, but he likes stories. After literature, he faces with his most challenging class, math. He starts off very focused, but gets distracted by his sleepiness in the latter part of the class. Finally, he wakes up as the teacher ends the class. He goes down the hall to get a drink of water. Then Virtual Coach, on his iPod Touch, reminds him to record his assignments from his morning classes. He's supposed to write 3 "jots" (notes on sticky notes about a reading) from his chosen book, *Henry and Mudge: The First Book* for Wednesday in Reading. And math he has a fractions worksheet to do for tomorrow. As he enters each of those, he gets a few experience points (XP) and gold for his avatar in the Virtual Coach game. He just needs 4 more XP before he levels up! Then he remembers that he hasn't set a goal for the week yet. He thinks about it for a minute, then decides on "Stay awake for all my classes" as a goal. Once he enters it, he levels up! He's excited because at level 2 he gains access to buy this cool blue hair for his avatar.

After lunch, Diego goes to his afternoon classes and then heads home. He goes back home and watches TV with his cousins for a while. Then it's almost 6:00 PM. His mom calls

him to have dinner. After he finishes his meal, Diego goes to living room and plays with his Beyblades, then after ten minutes, the app reminds him of his math worksheet that is due the next day, so he puts away his toys and sits down reluctantly to do his homework.

List of Requirements

- Welcome Screen
  - Set up username
  - Pick profile picture
  - Link account to email address or cell phone number (if want to use across devices)
- Assignment Module
  - Screen that asks what assignments received that day
    - When are they due?
    - Daily reminder to fill out information on new assignments
      - Can be set to happen right after each class
  - Screen at beginning of each semester to input what classes have and on what days
- Goal Module
  - Once a week (defaults to Monday)
    - Asks user to reflect on what they did to work toward the goal, if they achieved it, how they feel about it, etc.
    - Asks user to set a new goal for the week
  - 3-4 days later, reminds user of goal they set
- Learning Assessment Module
  - Learning Strengths Survey
    - Based on results, some kind of screen that says something like "Great! It sounds like you're probably strongest when learning visually right now, and maybe XYZ are some areas we can work on strengthening"

■ Presents user with brief information about learning and study strategies that fit their apparent best learning style.

User Testing Report

Risks:

Probably the biggest risk for our project is that it's not appealing enough for kids to keep using it. The metacognitive learning needs to take place over time, and with repetition. If the learners aren't motivated to continue to use the coach, it will be useless.

Another potential risk is that students will not understand *how* to use it, since again, if they don't understand how to use it, the rest of the project is moot. The accessibility of this product is crucial for kids to be patient and determined enough to keep using our product. For now, we think more clear and simplified interface and straightforward and concise sentence patterns would contribute.

Part of what we want to test is how much students are inclined to use this app consistently and over a long period of time. For this round of testing, we're just testing in the course of an hour or so, but with a more developed prototype we'd like to do a study over time, to test how much kids stick with using this, as early abandonment of the app is another significant risk. The app will also not have much impact if kids stop using it after a week.

Testing process:

We interviewed two sets of three middle school students, the first group was sixth graders, and the second was seventh graders. Our prototype will be a combination of an interactive prototype (for welcome and informational kinds of screens) and parts of HabitRPG.com (which is the inspiration for the more motivational/gamey components of the program), to see if the game aspects and rewards for tasks make sense to them and are appealing to them. We explained the project a little bit to them, then let them go through the tutorial. The

tutorial walked them through entering one class and a couple sample assignments, and also walked them through entering a goal for the week. Each time they completed these activities (entering tasks, goals, etc.) the tutorial will highlight the kinds of rewards they're getting on the screen (e.g., experience points, gold, etc.). Once they earned a little gold, the tutorial showed them the kinds of things they could use it for (including customizing their avatar with different clothes and equipment).

Once they completed the tutorial, we let them freeplay for a few minutes on the HabitRPG.com site before asking them questions to get a sense of what they think of the project. These are the main questions the students were asked after they had some time to explore the app:

- What kinds of things do you like about this?
- What kinds of things don't you like?
- What things worry you about this?
- What things aren't clear/don't make sense to you?
- How could we make this better?
- What kinds of games do you play?
- What kind of devices do you have at home/have access to?
- Do you enjoy using this?
- Do you think you'd use this regularly?

Results and Recommendations:

In general, both of our groups really enjoyed the app and were able to understand the structure of the game and how to use it pretty quickly. One big difference between the sixth and seventh graders was the public-ness they wanted for the system.

The sixth graders thought it should be a pretty private experience. They didn't think teachers or other grown-ups should have access to any part of it. They thought this would help

keep people from cheating in the game, if they weren't worried about other people seeing their progress in it. They also weren't very interested in having social aspects of the game.

The seventh graders were really excited about having the game completely integrated with their entire school experience. They were particularly interested in linking the game to a system they already use, called Engrade, which allows them to see their grades in all their classes, see if they're missing work and message teachers. They also thought it should be tied in with "School of the Future Bucks," which are fake "money" they get sometimes if someone sees them doing a good/nice thing. They can use the bucks to buy small trinket-type items, and also larger things, if they save up, like school t-shirts. They also thought a player should be able to unlock access to a chat feature at a certain level. But that administrators should monitor the chat rooms and if anyone said anything threatening or profane in them, those players would lose health.

The significant differences between the sixth and seventh grade perspectives in admittedly small sample groups *might* suggest that this design is a better fit for a slightly younger audience, or needs to be expanded for slightly older audiences; however, mostly these differences show that we need to do more thorough research across a wider variety of students.

We should also look into options to interface with an LMS like Engrade, though, and think more deeply about whether that makes sense. We had, at earlier stages, talked about the Virtual Coach having data that students could choose to share with, say, teachers at a new school, so they could get a different sort of snapshot of the students.

We should also do more testing over time with a more developed prototype, to see how useful it really is to students, and whether or not they tend to be honest with themselves as they're using it. Or, if they'll just go through motions to level up an avatar. It seems like some of that is probably fine, if most of the time they're getting motivated, and genuinely doing the tasks, but there's a line somewhere between that and completely abandoning the point of the app.

Students at this school (School of the Future- Brooklyn) are already quite familiar with the practices of setting a goal for the week, and reflecting on things they've done/haven't done. They have coaching sessions once a week to explicitly discuss those things with an adult, but also, all of the staff put a big focus on reflection when dealing with different behaviors or habits.

One of the students actually started doing this in the "notes" section of a test task he was creating for himself, before I introduced the concept. So another next step would be to do some testing with students who don't already have a structure that focuses so heavily on those skills, and see if they need extra scaffolding or other help getting started with that.