**Appendix I:**

**SMILE/Tinkering Workshop Day 1**

**July 1, 2013**

**Field Observer Report**

This report consists of the field observations from Day 1 of the SMILE workshop as it was incorporated into the “Tinkering” class at the Summer Adventures in Learning program at Bayshore Ministries in East Palo Alto, California.  The first section of the report consists of a profile of the workshop participants.  The second section of the report is a synopsis of the day.  The third section is a description of the field observer’s interaction with one of the students in the class.

**SECTION 1: Participant Profile**

|  |  |  |  |
| --- | --- | --- | --- |
| **Start Time** | 2:35 pm | **End Time** | 4:30pm |

|  |  |  |
| --- | --- | --- |
| **Adults Present** | 5 | Mira Gillet, M.Ed., InstructorAlison Burek, M.A., Field ObserverMalik (?), High School Class of ’13, Teaching AssistantSam (?), High School Class of ’13, Teaching AssistantElena (?), High School Class of ’13, Teaching Assistant |
| **Other Helpers** | 3 | Jackie (?), High School Senior, Teaching AssistantEva Gillet, 8th Grade, Age 13, Teaching AssistantCharlie Gillet, 5th Grade, Age 13, Teaching Assistant |
| **STUDENTS** | 8 | **Student Ages and Grade Levels (Fall 2013):****2** students entering Second Grade, Age 7**1** student entering Third Grade, Age 7**2** students enteringFourth Grade, Age 9**1** student entering Fifth Grade, Age 9**1** student entering Fifth Grade, Age 11**1** student enteringSixth Grade, Age 11 |

**SECTION 2:  Synopsis**

**Pre-workshop:**

Upon arrival, adult from site informed Instructor and Observer that class size was 10 students instead of 20.  Also said that there would be 3\* teaching assistants (high school upper-classmen and recent high school grads) in addition to Instructor, Observer, and youth teaching assistants.  Observer revised rubric to evaluate individual students instead of teams.

    Instructor and Observer quickly trained TA’s in SMILE rubric. Observer connected devices to the internet.  Instructor set out Design Boxes for later use.

*\*Another TA, a recent high school grad, increased the number of TA’s to 4; she arrived late and missed rubric training.*

**Workshop:**

1. Adult from site brought class into room and handed instructor a student roster, which she passed along to observer.  Observer asked if attendance needed to be taken.  Instructor said “no”.
2. Instructor began class by seating students in a circle.  In turn, three students and three TA’s were called upon to demonstrate “guessing game” with post-it.  “Fruit” flashcards were used as an example.  Objects to be guessed were simple, such as other pieces of fruit, writing implements, etc.

At first, instructor attempted guessing game with entire class knowing what was on post-it; several students yelled out the answer in spite of being asked not to.  Next two game iterations were 3-5 star questions, conducted with only the TA knowing the answer.

**Students were able to guess answers in less than 2 minutes each.**

1. The next step was to have been SIRI game, but deviation from lesson plan was required due to unforeseen circumstances: fourth teaching assistant was late, missed rubric training, and brought candy with her (against the rules apparently).  The candy served as a distraction to several students, and she was under the mistaken impression that the next step in the lesson was to for students to get their design boxes and start using them.
2. At this point, students grabbed boxes *en masse*.  Two of them ran into the hall with theirs, taking them apart and beginning to play with contents.
3. Instructor decided to reiterate SMILE game with students working with TA’s (two TA’s worked with two students each) to play the guessing game with objects in their design box.  Instructor checked in with each group to ensure SMILE rubric was being employed effectively.  Observer began taking notes.
4. Observer quickly ascertained that all students were fluent, “level 5” English speakers.  Began evaluating other criteria, such as attention span, peer relations, etc.
5. Observer also learned, to her dismay, that her question about taking attendance had been misunderstood; she believed it meant that all students listed on roster were present, and that she could therefore simply assign students numbers 1-10 for rubric purposes.

In fact, “taking attendance” meant that the program staff had used the printed roster to register which students were present for that day, and had noted this on a separate document.

1. Two students listed on the roster were not present in class; one student who *was* present was not on the roster.  Thus, the assignment of number to students is inaccurate.  This will require a different presentation of data than the chart she had originally planned to use.
2. Instructor moved into portion of the lesson in which students were allowed to investigate the inner workings of an object by taking it apart.  TA’s partnered with students to encourage them to formulate 5-star questions related to their object.
3. Snack break, after which students gathered in a circle to discuss how to use the parts from their machines, and the objects in their boxes, to create an invention.  Observer gathered student information about age, grade level, and whether they had fun.  Asked to rate how much fun they’d had on a scale of 1-5, with 5 being the most fun, the lowest student ranking was 5, and the highest was “a zillion”.

**SECTION 3: One-on-one field observation: can a student create a 4 star question without knowing what an object is called?**

FO was wandering the classroom, doing data collection, when she noticed Student 8 (age 7, entering 3rd grade) working on taking apart his object by himself.  She asked if he had a question about his object.

He replied, “What is blue, flexible, striped, and bumpy?”.  They proceeded to play “the guessing game” about his object.

FO pointed to one of the blue capacitors. Wrong answer.

Student 8 clarified: “It’s on the bottom half”.

FO pointed to one of the resistors.  Again, wrong answer.

Student 8 clarified further: “It’s on the right-hand side”.

FO realized at this point that he was talking about a cable that she thought of that color as being “gray”*,* not “blue”.  However, the student’s increasing specificity enabled her to get the right answer: it was the cable that connected the clock display to the circuit board.  In final form, the student’s question was, “What is blue, flexible, striped, bumpy, and located on the bottom right quarter of the object?”

Student 8 had no idea what any of these objects were called; for that matter neither did the FO.  Yet the student’s highly specific question enabled her to find the right answer while making her investigate the circuit board and thinking about what she was seeing.  Also, in spite of seeing the object as two different colors, Student 8 was able to create a question that made her investigate the circuit board and think about what she was seeing.

FO asked Student 8 to write up his question on the website, and handed him her Android device.  He readily figured out how to use the device.  Then he surprised her: “How do you spell “what?”, he asked.  FO literally had to spell out the entire question as the student typed.  He was not fluent with the keyboard, but clearly had a rough sense of where the letters were located, and was able to type the questions without help.

FO then explained that he needed to provide a multiple-choice answer set that made people think.  The answers right answer couldn’t be too obvious, which meant that the other answers should have some characteristics in common with the correct answer.  He chose the coil (bumpy, but red instead of blue), the speaker (bumpy, but black), and a capacitor (blue, but not flexible).

The FO’s coaching on answer set creation was by no means as extensive as the instructions he had received regarding the quality of the questions.  Yet, he was easily able to come up with a very thoughtful answer set.

As mentioned earlier, the FO did not actually know the relevant vocabulary.  She listed the “blue, flexible, striped, and bumpy” item as a LCD cable.  She later realized that the clock radio doesn’t have a liquid crystal display; the correct term is “ribbon cable”.  She also mistook the capacitors for “transistors”.  Therefore, his answer set does not contain the correct answer, and one of the other options in the answer set misidentifies the item in question.

In retrospect, the FO should have encouraged Student 8 to do internet search on the components of a clock radio or on different types of cable.  This would have enabled him to answer his own question, taught him internet research skills, and helped him learn the vocabulary concerning the item her took apart.

**CHALLENGES:**

1. The SMILE site required new log-in every time device went to sleep.
2. Two of six devices did not connect to internet in spite of each device recognizing the network:
	1. Field Observer did not know that her portable hotspot device would only connect to 4 devices at a time.
	2. For unknown reasons, other devices did not stay connected to facility’s WiFi, in spite of that network being listed by the device as “recognized” (i.e., device has previously been connected, and has been set to connect to that network whenever it is in range).
3. Didn’t know about mid-class break for snacks and bible story (15 minutes of class time) until arrival.
4. One TA was late, causing several minor disruptions (misinformed students about what would happen next in the lesson, needed to be quickly trained in the rubric, also brought in a bag of candy that caused distraction).  Instructor had to change lesson plan but adapted smoothly.
5. Didn’t know class size until arrival.  Observer had to revise chart on the fly.  Such is life.
6. Observer failed to take attendance. Lesson learned.
7. Observer is bad at putting names to faces.  Tomorrow, there will be nametags!
8. Upon later reflection, observer confused SMILE rubric with mere “specificity” and “making you think”, and did not fully consider higher-level Bloom’s items when working one-on-one with her student. This is likely because SMILE training focused exclusively on using website or ad hoc setup, not on rubric.  The only understanding the of the rubric the observer has is from working on the flashcards, which are still in process; the instructor’s understanding of the rubric comes from having read the flashcards, and having been given feedback on cultural setting.

**Conclusions:**

1. To the extent possible, field observers must know the technical parameters in which they are working (i.e., connectivity of various devices).
2. **All** facilitators should be present for pre-class debriefing on lesson plan and SMILE.
3. FO **must take attendance** for the accurate assignment of student numbers.

Appendix J: Day 2

SMILE Day 2:

-- Took attendance, assigned name tags, assigned **accurate** student numbers for rubric eval purposes; ascertained ages and grade levels

-- Internet connection was far more reliable; were logged on to site's "real" network as opposed to "guest"

-- SMILE server crashed iPod

--  Interrupted by snack ten minutes in (no set time for snack)

Tried to evaluate Reading Competency.

     (5) Reads and understands all instructions fluently

     (4) reads and understands basic instructions

     (3) able to read and understand instructions with basic guidance

     (2) needs help understanding instructions

     (1) unable to understand instructions despite assistance

Eval was done by by having students read Guessing Game instructions and asking "if you were going to play this game with me, what's the first thing you would do?".  Correct answer was "put post-it note on your forehead".

-- Only one student got the correct answer (only girl in the class; entering 6th grade).

-- Fluency when reading out loud (halting and mispronunciation) did not appear to affect ability to understand instructions

-- All students except the aforementioned said they'd begin the game by guessing.  The instructions indicated that **I** would be the one guessing.  This might be due to the teacher-student dynamic in which they're usually the ones answering questions.

-- rubric chart to follow

Collected info about languages

-- One student, an African American, reported speaking Japanese at home (?)

-- Two students reported speaking "only Spanish" at home.

-- Other four students reported speaking "only English" at home.

Invention Time/SMILE Questions about devices

-- Students very attentive (rubric chart to follow)

* + SMILE questions were completely integrated with tinkering/invention time.  Students were instructed to ask questions with certain technical vocabulary words in them (didn't take pic of list on whiteboard; hope Mira has a list).  The only one I remember was "rheostat".

review the parts inside of the gadgets that they took apart (gears, screws, nuts, bolts, wires, chip, bulb, circuit, transistor, rheostat, LED, motherboard, heating element, diaphragm, dial, switch,  electricity, electrons, etc etc etc). Have them research the functions of these parts

-- Very engaged with questions as well internet research.

      -- In some cases needed assistance narrowing them down to do research.  Student 1's initial question was "how do they fit all these things on here?" (meaning circuit board).  "Circuit board" was defined for him; it was demonstrated that Google couldn't answer that question because it wasn't specific enough.  Eventually, with help, narrowed question down to something much more wieldy.  Case in point about specificity.  Would have been nice to have more time to work on this.

     -- One student (Student 3), who was inventing an amphibious car, showed the Field Observer an image of a battery-powered remote-controlled car he'd found.  Image consisted of a set of wheels with some double A batteries on top. He told her that the car couldn't possibly work.  She asked him why; he informed her that there were no wires connecting the battery to the wheels.  He'd learned this in science class.  Good to know they still have those.

--  For questions, students were divided into two teams. Students on team 1 created their own question on the following topics: circuit board, electronics, microprocessors, switches, electrons (how they flow through wires!); Students on Team 2 created a question on LEDs

-- All students except one had good technical fluency (rubric chart to follow).

-- Students were VERY engaged, getting high marks for attention span (rubric chart to follow)

-- Except for one student who hadn't attended the previous day, students created questions quickly (under 5 minutes)

-- Per Roz, question quality improved markedly since Day 1.  Likely due to fact that students were creating questions **while** tinkering, and questions had to do with their inventions.

-- Cleaned up at 4:30, thinking that was the end of class, then learned it would actually be 5; decided to ask them for ideas solving "Jackie's problem".  One of the TA's is always late for school because she's too tired to get up in time to take public transit.  Students were visibly tired by this point, but brainstormed ways to make EPA more bike-friendly.

SMILE Day 2:

-- Took attendance, assigned name tags, assigned **accurate** student numbers for rubric eval purposes; ascertained ages and grade levels

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**July 3 Field Notes**

**SECTION 1: Participant Profile**

|  |  |  |  |
| --- | --- | --- | --- |
| **Start Time** | 2:05 pm | **End Time** | 5:00pm |

|  |  |  |
| --- | --- | --- |
| **Adults Present** | 5 | Mira Gillet, M.Ed., InstructorAlison Burek, M.A., Field ObserverMalik (?), High School Class of ’13, Teaching AssistantSam (?), High School Class of ’13, Teaching AssistantElena (?), High School Class of ’13, Teaching Assistant |
| **Other Helpers** | 3 | Jackie (?), High School Senior, Teaching AssistantEva Gillet, 8th Grade, Age 13, Teaching AssistantCharlie Gillet, 5th Grade, Age 13, Teaching Assistant |
| **STUDENTS** | 8 | **Student Ages and Grade Levels (Fall 2013):****2** students entering Second Grade, Age 7**1** student entering Third Grade, Age 7**2** students enteringFourth Grade, Age 9**1** student entering Fifth Grade, Age 9**1** student entering Fifth Grade, Age 11**1** student enteringSixth Grade, Age 11 |

1. **1:30: pre-class briefing**
	1. With so much to do, instructors arrived at the site at 1:30 pm, an hour before class was to begin.  Field observer went over SMILE activity and video parameters with Teaching Assistants (TAs).  They clearly understood the requirements.
	2. Field Observer (FO) planned to use the remaining half hour to photocopy the flashcards so that each student had a copy to use when evaluating questions (per Roz’s instructions), and then to make sure that each TA was logged on to SMILE.  This way, the day’s activities would begin immediately upon the students’ arrival.
2. **2:05: class begins twenty-five minutes early**
	1. Without advance warning from the site staff, the students arrived at the classroom at 2:05, instead of at 2:30 when they were expected.  The students had arrived at 2:35 on Day 1 and at 2:25 on Day 2.
	2. FO quickly designated pairs of students as teams and assigned them to TAs.  Instructor kept the class occupied while FO made photocopies.
	3. When she returned, students were rambunctious, running around the room, continuously asking when they would get to work on their inventions.  They were told that there was something they needed to do first, which was met with a complaints.  It took a lot of work on the part of every adult there to herd students back to their teams.
3. **2:30 SMILE Quiz (answering questions and evaluating them).**
	1. 2 out of 4 TAs were situated on website.  FO got another one logged on; instructor took care of the other one. There were a few login problems, but these resulted from case-sensitivity of SMILE usernames, and were quickly corrected.  Each team got started on their quizzes and question evaluations.
	2. There was enormous resistance at this point.  Students became disengaged, inattentive, frustrated, and angry.  The room resounded with complaints such as “this is boring”, “this is just like school”, and “I hate this”.  There was widespread lack of focus, with only one team of two was engaged consistently and quietly.  One student pretended to be asleep.  Another left the classroom and his team moved outside; later he took a beanbag from the classroom and used it as a sled to slide down the stairs.
	3. After class, Instructor suggested to FO that students may not have been completely disengaged; she pointed out that, at the very least, they were interested enough in the questions to ask who had written them.
4. **2:45: Video**
	1. As students finished this exercise, the FO got them going on the video before the facilitators lost control of the class completely.  She was surprised to find that there was even more resistance to this assignment – complaints, students leaving their teams, and at times, flat-out refusals – because she had expected their frustration to be somewhat tempered by the fact that they were “making movies”.
	2. **Noteworthy incident:** when asked how he would teach the SMILE questions, one student (who was lying face-down on a beanbag) said, “I don’t know what you’re talking about.”
		1. The FO’s inner classroom teacher took over at this point.  Forgetting that facilitators were not supposed to prompt the kids answers, she reminded him about the “1-star through 5-star” questions.  He repeated that he had no idea what she was talking about.  She left to check on other teams.  Upon her return she asked if his team had done the interview about the SMILE questions, and he repeated again that he didn’t know what she meant.
		2. This student had been in class all three days, and had created excellent questions and answer sets before.
	3. **Noteworthy Incident:** The only team in which both students were completely engaged consisted of one student who missed the first day, and another student who missed the second day.  FO has not followed up with this, but it was reported that *both* students rapidly seemed to understand the SMILE evaluation rubric.
	4. **Error in employing methodology:** Unfortunately, in the chaos, FO had forgotten that she and Instructor needed to demonstrate the video portion of the exercise.   This was to have been a critically important part of the methodology.  It would demonstrate, but not dictate, how the students were to conduct the interviews.  The students would be reminded of the previous two days’ lessons in a way that would not taint the data gathered during the interviews.  ***This mistake means that potentially valuable data will not come to light when the videos are reviewed, and that the method employed in this iteration of the research is flawed.***
	5. **Error in employing methodology:** Before class, the FO had made scripts and had photocopied them for the students AND the TAs, but she was unable to find them.  The interview was to have been structured as follows:
		1. Student A asks Student B: *“Think about everything you did in the tinkering workshop.  How would you teach the tinkering workshop to another student?”*

Then, Student B asks Student A: *“Think about everything you did in the SMILE workshop.  How would you teach another student to create 4 and 5 star questions?”*

* + 1. The scripts being lost, the questions were worded somewhat arbitrarily as the FO went to each team and asked something similar to: **“If you were going to teach [tinkering/SMILE to another student] how would you do it?”**
		2. **This error presents two problems.**
			1. The wording of the questions might have gotten the students thinking a little more about what they’d done and applying it to the instruction of another kid.
			2. It is also problematic that the wording of the questions is not standardized.
1. **3:00 Tinkering**
	1. Instructor reports that last year, students were engaged in tinkering right up until the end of the last day of class.  Unfortunately, by the time previous two portions of the lesson were completed, many students had had lost interest.  Several students said they were “done” with their inventions, were uninterested in taking anything else apart, and asked repeatedly to go outside; many of these students used their team’s devices to look at videos online or to play games.
2. **3:15 to 3:30: Snack**
3. **4:00 Clean-up; break time**
4. **4:30 Solving Jackie’s Problem**
	1. The previous day, the students had begun working on a design problem: one of the TA’s, Jackie, is often late for school because she has to get up very early to take the bus, and the busses are very slow.
	2. This problem was in the context of improving the community’s health, safety, and environment.
	3. Most students engaged at least partially with this process, and brainstormed creative solutions to it.
5. **4:45 What Did You Learn?**
	1. With 15 minutes left in class, the Instructor convened the group so everyone could share one thing they’d learned one thing they’d liked, and one thing they’d do differently. By this time the group consisted of 6 students; 2 of the students (brothers) had been picked up by their parents at 4:30.
		1. To the FO’s surprise, every student reported that the class was fun.  Though students had said on previous days that the class was “awesome”, she had expected that the day’s disappointments would color their opinions.
		2. Every student reported that they enjoyed taking things apart, and that from this activity, they learned how things worked.  Several specifically mentioned the “creative destruction” aspect to the class; one student referred to it as “breaking and making”, which the FO thought was a nice turn of phrase.  Most students said they liked Day 2 best.
		3. As far as improvements, one student reported not liking the questions on Day 1. Another student said there should be less talking from grownups (with a sideways glance at the FO), and there shouldn’t be questions at all.
		4. A student who had burned himself several times (very trivially) with a low-temp hot glue gun said that there should be welding next time, as well as “real car parts”, wheels, and more power tools.  The FO agrees about the power tools, being a bit of a junkie in that area.
6. **FO observations**
	1. The students were the most engaged with SMILE on the second day, which consisted almost entirely of tinkering.  TA’s went around the room and asked them to create questions regarding their objects.  The students kept tinkering while the TA’s typed in their questions and their answer ets.  This is probably due to the fact that the setting didn’t feel like “school”, and because they were very interested in the objects they were taking apart.
	2. Instructor reported that last year, which consisted only of tinkering/design, students were engaged right up to the last minute of the last day.
	3. After class had ended, Instructor told FO that our class had “all the trouble makers” and that this is why were assigned four TAs.
		1. FO would *never* have guessed this.  Even on the last day, when students were rowdy and inattentive, the students’ reactions seemed like a normal way to deal with their disappointment at not being able to tinker right away, as well as the fact that they’d been required to do a “school” activity during the summer.
		2. This demonstrates that tinkering – and even the SMILE questions, when they were well-integrated with the tinkering – is an excellent way to engage students who otherwise exhibit behavior problems.
		3. Instructor thinks the “troublemakers” signed up for the class because her blurb indicated that they’d get to break stuff (if they couldn’t open the device using tools, they were allowed to go outside and throw the object on the ground to open it).
7. **Challenges**
	1. Logging on to the SMILE site was a little problematic for two of the TA’s, but this was resolved when it was realized that the username was case-sensitive.
	2. As the class was delivered 25 minutes early, students were already rowdy and inattentive by the time they even began the SMILE answers and evaluations.
	3. Students were incredibly resistant to SMILE questions and to the video.
	4. The flash cards seemed to be a real turn-off.  The Instructor pointed out that you wouldn’t begin a game like “Duck, Duck, Goose” by handing out instructions on a piece of paper.
	5. As one TA said, flashcards and worksheet were too wordy.  This might not have been an issue with older grades, but it imposes serious comprehension challenges second graders who might not yet be fluent readers.

1. **Proposed Improvements**
	1. Field researchers would benefit significantly from more lead time.
		1. This would have allowed the thorough development of relevant data points as well as evaluation rubrics.
		2. This would allow field researchers the time to inform the site staff that there is an experiment taking place, and that controlled conditions are necessary.  While it is impossible to attain truly “controlled” conditions in action research, especially in an elementary summer school setting, at the very least students need to arrive at class and leave class at the same time each day.
		3. They would be able to secure consent forms before the process began, and possibly begin to collect demographic data as well.
	2. Field observer needs to take attendance and provide nametags for students.  This will the application of evaluation rubrics toward individual students.
	3. Instructor observed that if each two-person student team had a tablet device, it would be easier for them to navigate the SMILE site.  In spite of being a “mobile-based” learning environment, the SMILE web design does not scale to smaller devices like mobile phones and iPods. Those students working with smaller devices had to “drag” around the web page, making them work harder to read questions, answer questions, and rate them.
	4. The flash cards seemed to be a real turn-off.  The Instructor pointed out that you wouldn’t begin a game like “Duck, Duck, Goose” by handing out instructions on a piece of paper.
	5. To integrate SMILE into tinkering, it might be effective for two-student teams to take turns.  One student tinkers while the other student asks them to make up a question and answer set and input them on the website.  Then “it’s your turn”, and students switch places.  This method could also be used while answering and evaluating questions; one student tinkers, the other student types, and the student typing could easily take part in the discussion.
	6. Flashcards should be scaled according to grade level.  Many students seemed overwhelmed by the sheer amount of text on the page.  In my recollections of elementary grade reading material, nothing I encountered had that much text on it.
2. **Conclusion:**

On balance, both the action research portion of the workshop and the classroom experience were a success.  Some demographic data has been collected and will be collated and organized in the near future.  Various rubrics have been created to evaluate learner experience and characteristics.

Though the last day was extremely chaotic, we were able to gain valuable data through the video interviews.  The chaos also taught us about changes to the methodology design that will be necessary for future iterations of SMILE.

The FO’s major regret is that the first iteration of this project was employed in East Palo Alto.  This group already will be an outlier; EPA is a largely minority community where many people live in poverty.  Following iterations of the project will take place in Hillsborough, Redwood City, and Half Moon Bay, communities that are largely white and affluent.

Due to the fact that this iteration was essentially a methodological “dress rehearsal”, the data will be skewed in ways that could easily overshadow the ways in which demographic differences affect the deployment of SMILE.  This is especially disappointing given that SMILE has such potential to improve education in less affluent communities.