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Scalable Online Training

Student-Centered 1:1 Learning with Google Apps for Education

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Abstract

Instructional technology is a non-standard, rapidly evolving field, requiring evolving teacher fluencies with hardware, software, and integration patterns. These fluencies are not a component of pre-service teacher training, and building them extends beyond the capacity of schools to include when onboarding new teachers. As a result, while it is procedurally easy to purchase new solutions (buying one computer per student, known as 1:1, or adopting an application suite, such as Google Apps for Education), it is very difficult to enlist, train, and support teachers to use such solutions effectively.

Everett Roger's taxonomy of the stages of Diffusion of Innovation (Rogers, 1995) is an effective tool for describing and managing the challenging process of making adopted tools work in accordance with the public school mission to provide access equity for all students (and thus, all teachers). Early adopters serve as the research and development team in schools, helping validate the success of new initiatives in local contexts, but at some point school-wide adoption becomes necessary/desirable, at which point the informal, individually-motivated forces and locally available resources behind early adoption prove insufficient.

When school districts implement instructional software school-wide, **early adopters** share their successes with peers: an **early majority** of motivated teachers willing to work toward adoption. The latter group will pull from an array of local and other supports to adapt solutions to their own needs, and begin to move along Ruben Puentedura's Substitution-Augmentation-Modification-Redefinition (SAMR) track.

However, **late majority** teachers are not sufficiently motivated to make the same sacrifices to catch up. They need more help than in-service days provide. This puts schools in a difficult position when they are accountable both for making sound use of public expenditures and for providing equal opportunities for learning to all students, those with tech-savvy as well as tech-averse teachers. This project proposes a scalable solution mode that combines:

- **MOOC-style assessment**: using checklists and support resources, learners give to and receive feedback from cohort peers, rather than from paid instructors.
- **Turnkey Training**: early adopters play leadership and support roles, including facilitating discussions and meetings and providing course technical support.
- **Rich Interactive Self-Paced eLearning**: mediated, asynchronous instruction designed using Storyline for presentation and Captivate for software training.
- **Learning Content Management System**: all content is available online, indexed to activities, so that teachers can explore as deeply as they wish, when they wish.

Schools that adopt this model receive a "cookbook" for organizing the training, as well as all of the pre-developed resources. If they have funds, they can contract with Educational Collaborators to research and apply modifications of materials to fit their own environments; if they do not, their early adopter teachers who will be facilitating the training can modify materials and provide redirection as appropriate.

Phase I: Analysis

Background Information

Educational Collaborators (EC) is a national firm for school-based technology leaders who consult after work, including providing professional development for one-computer-per-child (1:1) programs. While current professional development is delivered by ad hoc teams using whatever materials they have access to as individuals, this raises questions regarding scalability and quality assurance issues:

1. *How can EC provide professional development to all teachers in a municipality or a state, if an instructional presence is required?* It may be possible to create scalable online courses using the MOOC approach: rely on peer evaluation rather than an instructor presence (save where the clients have a budget for high-end services provided by EC consultants.)
2. *How can EC guarantee training effectiveness when trainings are developed from scratch by whichever consultants are hired for the job?* A more standardized, branded approach, with a central repository of learning content and course designs, would serve EC better.

This project proposes to develop a pilot course, working with a school district that assigns an EC collaborator to approve and coordinate the effort. A pilot module has been developed in completion of this Capstone, and based on reports and evaluations of the deliverables of this pilot, EC may choose to solicit other school clients to fund full development and implementation of the pilot as a six-week summer or full-school-year course.

The model school for pilot development, Affton High School, is located in St. Louis, Missouri. Last year, Affton adopted a 1:1 configuration using Google Apps for Education (GAfE) running on Chromebooks. Per Director of Technology Dr. Robert Dillon's estimate, about half the faculty has been motivated to research, experiment, and share their view of best practice as innovators, early adopters, or early majority. Compared with most schools, this is very fast progress.

However, diffusion to the remainder of teachers in the high school has stalled. These comprise two of Everett Rogers' diffusion adoption groups: "late majority" and "laggards". The laggards make up 15-20%: their students do use personal computers at all in class. The late majority (25-30%) direct their students to use the Chromebooks, but in ineffective ways, limited to "substitution" (see SAMR Model, Appendix 8) and without the student-centered approach that 1:1 is designed to enable.

From a team rather than individual approach: As Affton moves from Six Sigma's "Storm" to "Norm" phase (Tuckman, 1965), standards are articulated and promoted through professional development and eventually by administrative imperative, and late majority teachers will be expected to step up. This course is a vehicle to facilitate that process.

Analysis Plan

Because this is a pilot project for a particular school, the local context is an important consideration. At the same time, the goal of the pilot is to develop a generic course that can fit the needs of entire states, or large municipalities. Elements of the local context that are not likely to exist in most other schools would not be considered as part of the course design, though local interventions would be recommended. Readiness assessments and preparatory consulting will be optional components of the general course offering, so it is appropriate to provide some of that work for this pilot.

Data Gathering for Phase I took the following forms:

1. **Prior Research** (Appendix 1):
   surveys conducted with Clarity, a commercial instrument.
2. **Interviews** (Appendix 2):
   held with Technology Director, 1:1 Coordinator, Target Group
3. **Survey** (Appendix 3):
   taken by all faculty during a full-school faculty meeting.
4. **Focus Groups** (Appendix 4):
   held with early adopters, student-centered learning advocates.
5. **Analysis Reflection and Planning Meeting** (Appendix 5):
   conducted with school administration.

Data Gathering from these forms was used to answer the following questions:

1. **Goal Analysis**: (Interviews) What are the current standards?
   What do administrators expect?
2. **Learner Analysis** (Interviews, Survey):
   What is current practice? Is our Target Population (TP) sufficiently literate in the use of Google Apps for Education (GAfE), such that an online course will be sufficient to help TP members meet articulated standards?
3. **Barrier Analysis** (Survey):
   What do members of the TP say prevents them from meeting standards now?
   What common assumptions, practices or attitudes are held by the TP that could be addressed by online training?
4. **Environmental Analysis** (Survey):
   Which barriers (real or perceived) are a function of the TP's experience of their environment? Which would block motivation to participate in online training and targeted change? What changes on the ground need be made to overcome these barriers?
5. **Task Analysis**: (Focus Group): What skills, knowledge and attitudes are required for standards-compliant student-centered 1:1 learning in a GAfE environment?
6. **Instructional Analysis:**
   Which knowledge, skills and behaviors will this course target?

A major target for this process was the design and application of a four-page survey (Appendix 2), conducted with all faculty to address these questions:

1. **Beliefs:** What do teachers say they believe?
2. **Self-Efficacy**: What do teachers say about themselves as tech adopters?
3. **Current Practice:** What do teachers say they are doing in the classroom?
4. **GAfE Skills Readiness**: How GAfE literate are teachers?
5. **Perceived Personal Barriers to Full Adoption:** (Skills, Knowledge, General Attitudes)?
6. **History with Tech Support and PD**: What have other Tech PD tried, with what success?
7. **Perceived Personal Barriers to Online Training:** What happened in the past? What is in the way now? What would Online Technology Professional Development need to offer to get buy-in?
8. **Interest in a Summer Course:** Would they take one, if compensated? What topic(s)?

Analysis Report

Initial Interviews with Dr. Dillon and Target Population

It was clear after the first interview that there were as yet no articulated local standards requiring teachers to make use of the 1:1 configuration in classes. Affton was still in Six Sigma's "Storm" phase, exploring what works but not requiring diffusion of innovation. Dr. Dillon offered the following description of how informal, evolving standards are described by the technology department:

> "We talk about the importance of students creating, making, and designing using the technology for the purpose of choosing what students learn, how they learn it, and how they showcase their learning with a mention that it can maximize student choice and voice with the result often being greater engagement in learning. This seems to be what 1:1 looks like for us."

Dr. Dillon admits that he neither formally supervises teachers nor speaks for Affton High School leadership about school building level goals held for teachers. A process for developing technology integration standards would need to be initiated and sanctioned by the principal. As the principal had to this point not made any requirements of teachers, Affton High School was not an ideal pilot for a training model developed to accelerate school-wide adoption.

Structured interviews were used to explore early majority teacher understandings and attitudes about expectations (or the lack of them) regarding adoption. Dr. Dillon expressed that as he was not in a supervisory role, he could safely conduct interviews (see Appendix 2) with six representatives from the target population and expect open responses. The interviews were conducted, recorded and transcribed, and their follow-up discussion built solid shared understandings about the target population, performance context, and learning contexts.

Summary of Target Population (TP) Interviews

1. ***TP teachers struggle with time required for routine tasks (receiving assignments, managing students at different stages of work).*** If 1:1 management can streamline regular tasks (permit error-free submission of student work which is never lost) and provide clear feedback (showing which students have completed work and now are "on their own"), it will likely be used.
2. ***Most of the TP still run traditional teacher-centered classrooms.*** In a 1:1 configuration, such teachers will require students to face the back of the room so that they can see student screens. This monitoring sacrifices the opportunity to build the trust with students required for student-centered learning. Changes to this practice will indicate success of the course.
3. ***Students understand that each teacher has different expectations for behavior and will adapt to each classroom.*** While teachers complain that there are few enforced shared standards for expectations and discipline, pursuing this difficult goal could be a red herring.
4. ***Using Google Chat is a common way students demonstrate distraction from teacher-directed activities***. Teachers can be counseled to respond to this kind of activity as formative feedback about engagement or clarity of instructions, rather than as an opportunity for a power struggle.
5. ***Teachers want any professional development to provide subject-specific (e.g. Math) modules.*** Teachers will not respond to generalized examples that do not match their subjects. Therefore, course cohorts should be registered based on their subjects, and examples and models should focus on subjects taught by the registrants in their sections.
6. ***Teachers require timely human responses to online work submissions and requests for assistance***. The role of Early Adopters will be pivotal, not only during the online course (as mentors and technical assistance providers) but as just-in-time supports and integration coaches (during the following school year to support transfer).

Gap Analysis: Technology Integration

Dr. Ruben Puentedura's SAMR model of technology integration describes an adoption continuum that Dr. Dillon often refers to: from **Substitution** (using a new technology to do what the older did), to **Augmentation** (finding ways for technology to enhance learning in new ways, but with the old tasks), to **Modification** (changing tasks to make use of technology affordances, where significant student achievement improvements occur), and finally to **Redefinition** (where the tasks and classroom structure change in more revolutionary ways).

Dr. Dillon's goal is that all teachers in the late majority group (who currently use 1:1 for "Substitution" activity only)adopt practices in keeping with Augmentation towards Modification stages reached by the early majority. He would like to see this happen by the end of the next school year.

Further, Dr. Dillon hopes that all early majority and early adopters will move up one stage on the SAMR continuum, and produce plans and student work examples, with supporting data, demonstrating the deeper integration of technology in accordance with Modification and Redefinition stages.

However, because Dr. Dillon's vision and goals had not yet been embraced by the principal, they could not be presented to the target faculty. Any progress towards further adoption would need to remain entirely voluntary, unless a different consensus emerged, perhaps as a result of organization around the goals of this training, something Dr. Dillon hoped for.

Gap Analysis: Student-Centered Learning

In the process of interviewing Dr. Dillon and co-designing goals for this course, we arrived at three teacher fluencies that support later SAMR stages. Effective 1:1 GAfE teachers are comfortable with:

1. Supporting student-centered learning as a frequent classroom norm;
2. Using GAfE tools efficiently to manage a blended learning environment;
3. Designing blended learning projects that combined these two fluencies.

As with the Redefinition phase of SAMR, the move from teacher-centered to student-centered learning (embodied in Active Learning, Collaborative Learning, and many other approaches) requires a gradual and sometimes messy paradigm shift involving deep changes to beliefs and habits. Contemporary learning theories support the importance of student-centered learning as an instructional strategy, particularly in 1:1 environments. Some studies reinforce this connection, though more research is needed.

Research supporting links between constructivism and instruction is summarized by Nanjappa (2003):

> "Constructivist views assert that learning is the active process of constructing rather than passively acquiring knowledge, and instruction is the process of supporting the knowledge constructed by the learners rather than the mere communication of knowledge (Duffy & Cunningham, 1996; Honebein, Duffy & Fishman, 1993; Jonassen, 1999;). …
>
> Within this shift in focus from the objectivist to the constructivist context domain, technology can play an integral part in the learning environment (Duffy & Cunningham, 1996). … [When teachers integrate] technology with constructivist methods, such as problem-based learning and project-based learning, learners are more responsible for and active in the learning process (Grant, 2002)."

Common Framework

With the shared understandings described above, initial interviews led to formulating a framework for course goal-setting and survey design that informed task and gap analysis:

1. **Paradigm Shift**: adopting Student Centered Learning (SCL) with fluency.
2. **1:1 Classroom Management**: using GAfE affordances to streamline procedures effectively.
3. **SCL in a 1:1 Classroom**: designing and implementing Project Based Learning (PBL) with GAfE.

Within each of these three stages, three levels could be self-assessed by teachers to self-identify readiness:

1. **Not Exploring** (Rogers' "laggard" position).
2. **Exploring** (learning, experimenting, finding personal norms)
3. **Fluent** (capable of reliably effective practice)

Stages 1 and 2 are not seen as sequentially dependent, but fluency at Stage 2 (2.2) requires Stage 1 fluency (1.2). Stage 3 fluency requires fluency at Stages 1 and 2.

With this framework established, it became possible to sketch out the scope of online course coverage (whether within one course or a series), and provisionally define transference requirements (implementation and support needed for adoption). These rough scaffolds supported design of an anonymous faculty survey to identify barriers, assess readiness, and gauge interest in course content.

Both SAMR progression and the adoption of student-centered learning require experimentation periods when deep shifts in approach can be made. During these periods, teachers need to feel safe (knowing their performance will not be adversely evaluated during experimentation) and supported (realizing they have access to local mentors, coaches, and expertise to help with problems that threaten classroom culture).

Clarity Survey Results

Analysis began with results from an annual Clarity survey (Appendix 1) administered at the end of last year. Most significant findings (with implications for the teacher survey and course design) are below.

1. ***Only 10% of AHS teachers reported their students write online at least weekly, 23% monthly. 62% never do.*** This is significant because writing online is a key part of 1:1.
2. ***Almost three quarters of teachers report using 1:1 in classes almost daily.*** This validated Dr. Dillon's estimate that 50% use 1:1 well, 25-30% use it but not well, and 20% do not use it.
3. ***Only 27% of teachers do online assessment with students at least weekly.*** Regular Formative Assessment with GAfE is a powerful opportunity to streamline work and increase feedback.

4. ***Very few (10%) teachers use Google Apps regularly to facilitate peer feedback.*** This is a powerful use of 1:1, but requires comfort with a student-centered approach.
5. ***Only 17% of teachers ask students to collect and analyze data at least weekly****. In contrast, 40% of teachers report that students use web tools to receive online information at least weekly. The significant difference between these two percentages is that receiving information is a lower order thinking skill than analyzing it (Bloom).*

Course Survey Results: Gap Analysis

Based on the results of the surveys, interviews, and a research review of common barriers to technology integration diffusion, the instructional designer created a list of value lists of beliefs, barriers, and approaches. These beliefs, barriers and approaches were then compiled and used as choices within survey question items. The survey (Appendix 3) was delivered via Google Form to all high school teachers (54) during a faculty meeting. Below are key highlights and implications.

1. ***Less than 50% of teachers are fluent in Google Classroom.*** *Classroom is GAfE's LMS, a fast onramp to more complex 1:1 management functions that take time to master.*
2. ***63% of teachers are fluent in Google Docs****. Therefore, nearly half of the target population is not fluent, and will need some refreshers.*
3. ***Only 22% of respondents are fluent in Google Sheets, and only another 23% are exploring.*** Spreadsheets are powerful for analyzing quiz results and rubric self-assessment. An introduction to Sheets should be a focus of a 1:1 management course.
4. ***32% are using formative assessment, and 13% are exploring it.*** TP is not exposed to formative assessment methods yet. Combining Google Sheets with Formative Assessment will be a powerful offering for the course.
5. ***35% of respondents are fluent in Google Sites, and 41% exploring.*** *Google Sites are key to Project-Based Learning.*

Course Survey Results: Context Analysis

1. **39% would like chat turned off, as this is the primary distractor when students use computers.** Dr. Dillon is against this strategy as it limits possibilities (particularly since chat is necessary for Hangouts and Google+ circles), but it may be necessary for buy-in.
2. **26% want to have software to monitor student screens.** This strategy reinforces teacher-centeredness (at desk watching monitor vs. circulating and correcting).
3. **44% of faculty cite time and priorities as barriers to experimentation and study.** These environmental barriers are beyond an online course's capacity to remedy. However, administrative support behind the course can be associated with accommodations.

Course Survey Results: Needs Analysis

1. **50% of respondents are interested in a summer course.** This includes a majority of the TP, based on cross-referencing other questions.
2. **50% are interested in an online course on managing 1:1 classes.** This includes a majority of the TP, based on cross-referencing other questions.
3. **60% would prefer a course on 1:1 management with Google Classroom for SLC, and 39% prefer Project-Based Learning (PBL) with Google Sites.** This was a "pick only one" question. The latter choice attracted early adopters and early majority.
4. **21 English and Social Studies teachers would take the online course; 13 Math and Science teachers would, along with 12 "specials" teachers.** To support teacher preferences for learning applications in their content areas, the pilot summer course should be humanities focused.

The following tables include the instructional designer's analysis of faculty survey responses in *italics.*

Which of these would you like to explore next?

Program	#	Analysis Notes
Forms	8	*This is good information, and expected, given 1:1 Management issues.*
Hangouts	7	*This is a surprise! Why do teachers want this? Need to find out.*
Sheets	6	*This is a companion to Forms, so represents 14 out of 15 respondents.*
Groups	5	*This is of most interest to teachers who are not using Classroom.*
Classroom	4	*These are teachers who are aware others are using Classroom.*
Google +	3	*Again, this is a surprise. Why do teachers want this? Need to find out.*

Which one of these SCL activities have you ALREADY tried / MOST like to try with 1:1?

SCL Practice	Now	Try	Analysis Notes
Students as Teachers	3	6	*With Peer Review, this argues for Jigsaw and "Student Work As Study Material" leading to ePortfolios.*
Cooperative Learning	6	5	*Perhaps teachers can build a 1:1 SCL wiki indexed by Cooperative Learning models (e.g. Jigsaw)?*
Peer Review	2	5	*Pair Student-As-Teacher with Peer Teaching (students teach each other in Jigsaw) and Peer Review (students review each others' materials with checklists to determine readiness for full-class..*

Problem Based Learning	0	5	*Pair Cooperative Learning with Problem Based and Discovery Learning as a project model. Teams are given a problem. Within each team, one half does discovery (learn about the content) the other half does PBL (focus on solution) and then they Jigsaw.*
Case Studies	3	4	*Case Studies should include video (Youtube Closed Captioning for first-run transcriptions then later students edit) and Group Projects.*
Game-Based Learning	7	4	*High "Already" means Jeopardy-style quizzing, not sims. Webquest Projects can include a role-playing game component.*

Focus Group

Extensive planning resulted in a teacher-led, 45-minute focus group to explore practices and paths to student-centered learning among early adopters and early majority (Appendix 4). Although focus groups were a new practice to Affton, it was hoped that having no administrators present would enable faculty revelations of "the good, the bad, and the ugly" of SCL adoption. This talk was recorded, with transcript edited and shared with all participants.

A table below summarizes the findings from this focus group, using a coding category. While the focus group occurred after the design process had concluded, findings served to validate all of the assumptions that led to the design, including the central premise that while student-centered learning (from a teacher's perspective, "learner-centered teaching") was time-intensive and challenging, faculty members believed the adoption of 1:1 would make / had made it much easier to prepare for and adjust to.

At the same time, a 1:1 seemed to require a shift to SCL: computers provided easy and engaging competition for attention to teachers instructional plans. Teachers expressed a need to surface (make explicit) and respond to student interests and desires in order to obtain and maintain students' enlistment and energy in instructional goals.

Perhaps the most politically significant local and global lesson from the teacher focus group was the shared frustration with apparent disconnects between articulated and implied administrative priorities. School and teacher evaluation currently values teaching to standardized tests, while student-centered learning requires some de-coupling of curriculum maps in favor of sharing control over paths and pacing with students.

It was clear to focus group participants with SCL experience that giving curriculum coverage first priority makes student-centered learning prohibitively risky and costly, while allowing evolving classroom activity to direct the flow of instruction makes tight curriculum map impractical. Tight curriculum map coupling has functions beyond test preparation: it also affects what teachers may count on students knowing from previous classes. Administrators will not likely advocate for abandoning that coupling.

This tension is a national problem now. While the swings from standards-based to student-centered have been a regular feature of American educational policy, the stakes have increased, first from No Child Left Behind (pronounced “Nickleby” by teachers), and followed by the rise of Pearson, an “educational-industrial complex” that sells curricula (Common Core State Standards, or CCSS), test design (Partnership for Assessment of Readiness for College and Careers, or PARCC), and online testing (Smarter Balanced Assessment Consortium, or SBAC).

AFTERNOTE: This tension is near-universal, and will likely create barriers for any late majority teachers who justifiably feel more risk-averse than earlier-adopting peers. To stimulate discussion around this issue, the following True/False question was included in the eLearning quiz: “High stakes standards testing and student-centered learning are incompatible.” This question serves as a coal-mine canary: If its inclusion results in pushback from school clients who hope to continue to straddle that fence, it can be modified for that instance; but if no objections are raised, it may help school stakeholders consider the political implications of a student-centered 1:1 approach.

Focus Group Findings

The following table summarizes the transcript of the focus group discussion.

Comment summarizing focus group sharing	**Category**
Teachers need to go SCL in teaching to compete to motivate students once students have devices with options.	1:1 helps SCL
1:1 can make SCL prep easier. PCs empower students to choose among multiple learning paths so it is easier for teachers to let go of control.	1:1 helps SCL.
1:1 media enables students to pursue cultures and contexts of meaning to them. Balances the "one right view" of things unsaid by textbooks or TCL.	1:1 helps SCL.
1:1 supports student contribution to lesson design. Students carry new 1:1 ideas from class to class if teachers let them share - “bee pollination”	1:1 helps SCL.
There are too many 1:1 tools for teachers to master all. Peer teaching needed if SCL means choice of methods.	1:1 helps SCL.
1:1 means teachers can demand higher quality of work from students (SCL quality) when students have their own devices outside class. Class time can be for interaction, not individual work.	1:1 helps SCL.
SCL means students can teach each other 1:1 tech skills.	1:1 helps SCL.
SCL supported when teachers ask students to teach. No single source of expertise or need.	1:1 helps SCL.

Teachers can learn openness / peer sharing with each other from role models of how students share.	1:1 helps SCL.
Admit you are in an innovation / experimentation period and involve students in recognizing that. This is both for SCL and for 1:1.	1:1 SCL Tips
All teachers need to accept the SCL 1:1 goal, but can move forward in their own way. Letting go of old curriculum can be hard.	1:1 SCL Tips
Initial 1:1 SCL activity: students research, create presentations and teach each other.	1:1 SCL Tips
SCL culture is adaptive for students as well as teachers. Freshmen will adapt faster than seniors.	1:1 SCL Tips
Teachers can recognize the source and draw of TCL in order to let go of the practice.	1:1 SCL Tips
To guide 1:1 SCL, teachers need to break down tasks into components and teach to and prep for supporting those components.	1:1 SCL Tips
Because of time required for SCL, teachers must choose between SLC and test prep, and need explicit administrative support for that choice.	SCL Tradeoff
A culture of student sharing is critical for 1:1... It is also important to avoid the power struggles when teachers attempt to prevents students from sharing, as those struggles block SCL.	1:1 Tradeoff
Involving students in co-planning takes time from instruction, unless co-planning is viewed as a learning goal. Making it a goal helps justify SCL.	SCL Tradeoff
Prep patterns change for 1:1 SCL in order to support multiple paths. Open / authentic assessment prep also takes longer. Maybe it gets faster later?	1:1 Tradeoff
Maintaining a teacher presence in class is more demanding for SCL work than for worksheet / written work. So in SCL, teachers have less time to do grading and prep during class.	SCL Tradeoff

Planning Meetings

Two planning meetings have been planned for the adoption project described in this study. The first of those meeting, which took place on March 17th, proved instrumental for bridging the gap between analysis and design. The Marcy 17 meeting (Appendix 5 brought together the instructional designer (via Google Hangout), principal, vice principal, and technology team (Dr. Dillon and the 1:1 coordinator). Meeting time was used to review survey results and consider the role of administrative leadership in supporting the diffusion of innovation towards full adoption of 1:1 by faculty.

Dr. Dillon felt the meeting was very positive and stated that the meeting helped him advance shared understandings that had thus far eluded the administrative team.

As a result of this March 17th meeting, the principal agreed that best practices discovered in the first year of the 1:1 implementation should be articulated and shared with expectation for teacher adoption in the next school year. With that understood, the course designed through this Capstone would be an appropriate step to support that transition. She also approved some of the elements of the course design that will be described in the next phase, including reliance on early adopter teachers as turnkey trainers and online course technical assistance providers.

With those approvals, a second planning session, yet to be scheduled, will invite all early adopters to explore participation in the course, and provide feedback about initial design decisions. Relying on Early Adopters is a key aspect of the course strategy to make it scalable.

When held, this early adopter meeting will be conducted via Google Hangout. Invitees will be identified by Dr. Dillon. The meeting will explore some of the proposed roles and functions identified by the course model, and elicit reactions and new ideas from this group. At the end of this meeting, participants will have an opportunity to commit to contributing to the course as facilitators and mentors, and to support their colleagues as coaches.

Design Implications from Survey

Two questions include the in the Course Survey discussed above addressed the design of the online course. The first question was free response. Of 54 respondents, 44 identified problems with online courses, which were coded (to allow for counting). In the list below, 30 respondents identified common issues, while the 14 singleton responses were not included.

When online courses don't work for me, it is usually because....

1. ***Directions are inadequate*** ***9***
2. ***I need personal contact*** ***8***
3. ***Lack of motivation to complete course*** ***4***
4. ***Poor design of course activities*** ***4***
5. ***Discussion boards are busywork*** ***3***
6. ***Difficulty navigating the LMS*** ***2***

These barriers can be addressed with a design that includes adequate directions, well-designed activities and bulletin board discussions, employs hangouts for tech support and group check-ins, and offers effective LMS navigation training tutorials.

Motivation can be fostered with quality, engaging “sales talk” videos starting each module. The second question addressed teacher preferences with answers given via checkboxes.

Which of these design elements would you want to see in the next online course you take?

1. Start with the basics	***12***	***22%***
2. Assume we know the basics	***13***	***24%***
3. Flexible Schedule (go at own pace)	***25***	***46%***
4. Regular weekly schedule (all together)	***4***	***7%***
5. Everyone learns the same thing together	***2***	***4%***
6. Separate sections based on learner needs	***24***	***44%***
7. Optional after-school Hangouts	***5***	***9%***
8. Optional evening Hangouts	***4***	***7%***
9. Use Google Classroom as Home Base	***18***	***33%***

Responses revealed a clear preference (46%) for flexible scheduling over weekly scheduling (7%). During the school year, the preferred strategy can be used; however the six-week summer course schedule does not extend across a timeline that supports flexibility. As teacher-participants of the training will have no competing school demands in August, this served; however, it would be easier on teachers to run a full-year course.

The teachers surveyed also expressed a clear preference for separate course sections (44%) geared for teacher subject areas over course sections generic in terms of teaching discipline (7%). The instructional designer intends to address this by combining Humanities (English and Social Studies) in the summer course section, and then offer a discrete STEM course section (Math, Science, applied studies) in the fall.

A split existed among teachers wishing to "start with the basics" (22%) and those proposing course design "assume we know the basics" (24%). This can be addressed by providing optional but clearly marked help text. Initial instructions for activities can be minimal, with links to optional video walkthroughs and other expanded supports. Of respondents who expressed a preference for LMS platform, a majority (33%) preferred Google Classroom over Schoology (2%). This supports teachers learning Google Classroom first as students, second as designers.

Unfortunately, Google Classroom exhibits a limitation common among Learning Content Management Systems (LCMS) regarding content sharing: Resources shared during a course are not available to students afterward. Moreover, relative full LMS platforms course interface in Google Classroom is extremely limited, requiring minimalist sharing. Google Classroom needs to be paired with a Learning Content Management System if learners are to be given opportunities to go beyond required readings, or if readings and resources need be available after the course ends.

Taken together, 16% of respondents would find Google Hangouts helpful, with a split over preference for attending course meetings in the afternoon (9%) versus evening (7%). Because of the importance of involving Early Adopters and supporting Face-to-Face contact, we will hold one weekly recorded hangout-on-air at each time, staffed by an Early Adopter, and encourage teachers to watch the hangout of their choice if they did not participate in a live session of the Hangout.

It is anticipated that access to archived Hangout sessions will boost participation in successive hangouts. If attendance in live Hangouts were consistently low, the instruction designer may choose less complex live classroom tools (e.g. GoToMeeting), or downgrade to telephone conference calls.

Final Analysis Thoughts

There is a continual tension between customizing this course for Affton (based on the pilot school analysis) versus withholding consideration of the model environment and other contextual factors to maintain the intended, broader generic reach of the course under design.

As stated previously, a part of the solution model includes an option to hire EC collaborators to customize the course and organize local Early Adopters in client settings. On the other hand, such customization should not be a requirement for program success. In consideration of this, the success of the pilot at Affton will not be definitive in forecasting effectiveness within generic implementations. Significant redesign may be needed for the first commercial pilot.

Phase II: Design

Course Goal

This course supports schools and districts using Google Apps for Education (GAfE) to support Student Centered Learning (SCL) in a 1:1 environment by accelerating adoption of local standards and best practices by "late majority" teachers.

Objectives Framework

Discussions with Dr. Dillon resulted in a three-stage curriculum framework:

A. **Pedagogy Shift to SCL Paradigm:** Support adoption of student-centered learning.
B. **GAfE Technology Skills for 1:1 Management:** Using GAfE to manage digital workflows.
C. ***Project-Based Learning Design Skills:*** *Designing and building PBL units with GAfE.*

Project Based Learning (PBL) design is italicized because it was later split off into a new course, both because it requires success with the first two, and because in the Course Survey, other teachers already approaching fluency with the first two stages expressed interest only in this third stage. This course will address the first of the two stages, which together provide a foundation for implementation.

Because many members of the target population have not had good experiences with online courses (per survey), a fourth set of objectives was added:

D. **Online Learning Skills**: Prepare participants to participate fully using course tools.

Those objectives would be met in face-to-face pre-course orientation sessions facilitated by early adopters.

Performance Objectives

The following outlines list performance objectives associated with the framework described above. Choices were informed by software in current use at Affton.

I. Pedagogy Shift to SCL Paradigm

A. STUDENT-CENTERED LEARNING

1. Accurately describe Constructivist Learning Theory and list three pedagogic implications.
2. Given SAMR stages, correctly describe each, and give an appropriate 1:1 example for each.
3. Given a SCL model, describe it accurately, citing benefits and implications for teaching.

B. STUDENT-CENTERED LEARNING in a 1:1 CLASSROOM

1. Summarizing a Google Group discussion, accurately list challenges with SCL in a 1:1 classroom.
2. Given a list of SCL 1:1 challenges, list and describe structures and supports to address each.
3. Given an SLC model, design an application for a 1:1 environment, and describe how that environment supports the benefits of the model using the design.
4. Given a self-designed SCL lesson, correctly identify the SAMR stage associated with it, and redesign the lesson as an appropriate example of the next SAMR stage.

II. GAfE Technology Skills for 1:1 Management

A. DOCUMENTS, GROUPS AND DRIVE

1. Given student emails, create a Google Group with a clear subject prefix and direct-add students.
2. Given a read-only shared Google Document, make a copy, place it in “My Drive” and rename it.
3. Given a class Group, share a Document with it, as “Comment Only”, with a share message.
4. Given a shared document, add it to “My Drive” and place it in a self-named folder.
5. Given a Group-shared document, initiate posts and reply to comments in the share thread.
6. Given a shared document, subscribe to notifications, add and reply to comments.

B. CLASSROOM

1. Given peer emails, create a Google Classroom course and invite partner and 2 peers as students.
2. Create a Google Document-based assignment template within the appropriate Classroom-linked folder, and post it to Classroom with appropriate instructions for students. Complete 3 assignments.
3. Given a posted assignment, clarify with responsive comments, and receive submissions.
4. Given assignment submissions, use comments to respond and request revisions.
5. Given document revisions and comments, assign and record a grade in the Classroom gradebook.

C. SLIDES

1. Given a list of Slide design criteria and a model, create a Rubric with Sheets.
2. Given a content outline, create a Slide Deck with animated bullets and illustrations.
3. Given a shared Slide Deck and Rubric, Comment on slides to inform redesign.
4. Given slide comments, redesign Slide Deck and resolve comments.
5. Given Screencastify and a Slide Deck, record a screencast, share to Youtube, add to Classroom.

D. FORMS AND SHEETS

1. Given a list of criteria for an assignment workflow and a model, create a rubric with Sheets.
2. Given a Classroom assignment workflow rubric, design a learner response survey using Forms.
3. Given a Form Survey, use Classroom to request responses as a course assignment.
4. Given Form MC responses, view Summary of Responses to evaluate assignment effectiveness.
5. Given Form TXT responses, reformat response Sheet to read each response by student and make Sheet-based comments as appropriate.
6. Given Form, create a copy as a Quiz target responses to a worksheet in the old Response Sheet.

E. GRADING AND FEEDBACK

1. Given Flubaroo and a Response Sheet, install Flubaroo, configure and apply to quiz grading.
2. Given a graded Quiz Response Sheet, share grades & apply to the Classroom Gradebook.
3. Given a set of assignments as a Unit, review and provide individual student feedback.

III. Online Learning Skills

1. Given an invitation, enroll in a Google Classroom course and be able to return to it.
2. Find given course Group from “My Groups”, post to it, find an identified post, and reply to it.
3. Given a template provided, create a new Site and rename it to use as a course ePortfolio.
4. Given an Announcement page to use as a Blog, create and manage blog posts.
5. Given a Blog post, Copy and paste the full URL into a Google Classroom post comment.
6. Given a partner email address, Initiate and respond effectively to Hangout invitations.
7. Given a live Hangout, adjust audio and video settings, toggle the chat window, and share screen with other attendees..

Instructional Strategy

Course Design Process

To reinforce the consideration of factors revealed in research and analysis, and to maintain a comprehensive view of entry behaviors and performance requirements associated with each task, the following approach was used to define modules, which are components of each course topic:

1. Design Course Module Creator form with fields for all indicated considerations.
2. Submit modules via Module Creator based on Course Outline and saved items in subfolders. Merge module creator form results into text docs; move these into Course Topic folders.
3. Link Course Topics modules to associated resources to be shared. Move other resources to "background" subfolders and/or Gappsfored.com.
4. Develop Articulate Storyline module for each topic that requires it.
5. Develop Activity Diagram for each module (if appropriate)

Course Delivery Components

1. **LMS**: **Google Classroom.** Since GAfE is a major course delivery goal, it is appropriate to familiarize teachers with the environment and tools as learners. All work will be done with GAfE.
2. **LCMS: Custom Drupal Site** (Gappsfored.com). Since Google Classroom is very limited in the display of hypertext (assignments are text-only) and curation of content (all content is presented as a stream, rather than as a library), an external site targeted by Classroom provides these features and persists after the course ends as a go-to resource for job aids and refreshers.
3. **eLearning Module Platform: Articulate Storyline**. To facilitate interactivity and rich media using a structured presentation, a Storyline Template will simplify and model the GAfE interface.
4. **Software Training Platform**: **Adobe Captivate.** Captivate is an easy way to create click-through tutorials and performance assessments, needed by teachers who are not facile with new tools. Captivate will be delivered within Storyline.

Instructional Approaches

The following four approaches were each designed to support a successfully scalable online course.

1. **Early Adopter Teaching Assistants (TAs)**: The course is designed to be scalable, based on MOOC models, without an instructor presence required. MOOCs rely on peer feedback to provide a human component. Because all schools who are ready for 1:1 adoption will already have early adopters who can serve as mentors and coaches, the course is designed to enroll these as mentors and facilitators. Early adopters often seek leadership opportunities and are willing to serve as teaching assistants (TA). A ratio of 6 teachers per TA is sought; Ideally, TAs will share the content area specialties of the course section.
2. **Use of Google Hangouts**: All participants will have access to on-demand videoconferencing with each other and with course TAs through Google Hangouts. The on-site orientation will include training in Hangouts for technical assistance, and the course will include two weekly optional hangouts, one in the afternoon and one in the evening; Hangouts sessions will also be recorded for participants who cannot attend either live session. These Hangouts (both live and recorded) will help develop a live community cohort.
3. **Formative Evaluation by Peers**: Because Google Classroom is not a robust LMS, it is not designed to receive data from eLearning modules such as Captivate or Storyline. However, because the course is ungraded, this limitation poses no concern. Students will provide artifacts and activity through the Google Classroom interface, and evaluate each other's' work using rubrics and Google forms that generate performance data. TAs will access this course data to initiate offers of support and coaching to participants, and course designers can late access course data to inform redesign.
4. **Transference Plan**: An online course alone is insufficient for transfer. The online component is part of an extended design, wherein teachers are coached by TAs to design, develop, implement, assess and showcase their work during the school year. School principals, along with technology coordinators, have an active role in preparing each school for the course by enlisting early adopters, setting aside time for pre-course surveys, and by promoting course goals and building leadership objectives. After the course, principals will be encouraged to set aside time for teachers to collaborate on designs, and to plan a district or regional conference at which teacher showcases can be shared and discussed.*

** NOTE: This last strategy requires early buy-in and very active involvement by a range of actors in the performance environment. While all aspects of the solution model are documented as best practices for teacher professional development, not all future school clients will be ready to adopt them. Many factors beyond software and pedagogy training are necessary for a 1:1 adoption to succeed, and this course will encourage learners to consider and address these as a component of applying the course to their practice.*

For example, there may be schools where early adopters are not available or empowered to play the intended roles, and external trainers will need to be hired. Introductory materials about the course will clearly state the supportive role each element plays in achieving goals. As a step in the contracting process, administrators will sign a checklist indicating their understanding of key performance environment supports for successful transference.

During the course, the articulation of performance environment supports will also be introduced in the context of Activity Diagrams associated with each module. These diagrams, based on the model developed by Yrjö Engeström (2005), articulates the elements that define, enable and limit the conduct of activities in social contexts. A Google Slide template allows course participants to create their own examples if they are so moved. One example from the eLearning Module can be found in Appendix 9.

Instructional Units – PRE-COURSE

1. Early Adopter TA Orientation (Online – Series of Hangouts)

The pivotal role of Early Adopters in the course design as Teaching Assistants (TAs) includes facilitating hangouts, contributing to discussions, modelling interactions, and providing technical support as needed. The distinction between (Pilot) and (Future) concerns the development roles Affton's early adopters agreed to perform in the planning meeting above.

1. **Planning Hangout**
    a. **(Pilot) – Agenda**: Discuss **Syllabus**, roles, needs and supports for TAs and learners, with course designer providing and modeling. A recorded version of this conversation will support later course iterations.
    b. **(Future):** Excerpts from the recording of the above Hangout will seed creation of a video that initiates a Webinar, with a volunteer TA facilitating.
2. **TA Discussion Facilitation Webinar**:
    a. **(Pilot) Agenda:** Discuss best practices for maintaining high quality, authentic discussions in Google Groups and Hangouts, using those two tools. Hangout discussion will include viewing a **Video** together. Participants will conduct follow-up discussion posts in a **Group**. This will be instructor-led for the Pilot only; a recorded version of this conversation will support later course iterations.
    b. **(Future):** Excerpts from the **Recording** of the above Hangout will seed creation of a **Video** that initiates a Webinar, with a volunteer TA facilitating Agenda.
3. **Orientation Preparation**
    a. **(Pilot) Agenda** preparing TAs to facilitate orientation prep Hangout. Review **Captivate Tutorial**s for ePortfolio Site creation, Hangout Training, Google Group, Survey, Video. This session is instructor-led via Hangout for the Pilot only; a recorded version of this conversation will support later course iterations.
    b. **(Future):** Excerpts from the **Recording** of the above Hangout will seed creation of a **Video** that initiates the Training Prep Hangout, with a volunteer TA facilitating.

NOTE: Because this course is online and many teachers express a preference for face-to-face instruction, the recordings of Hangout meetings by Affton's early adopters as they follow the outlined process will become key materials for future implementations, in the following ways:

1. *Helping prospective schools visualize the roles their own early adopters will play;*
2. *Modeling participation roles for client school early adopters;*
3. *Clearly defining a teacher culture (rather than a technology culture) for future cohorts.*

4. *Learner Cohort Orientation (On Site)*

A face-to-face orientation session involving all participants will be conducted to ensure technological readiness and motivation to succeed. A face-to-face meeting will be held at the end of the school term before the course begins. The meeting will be run by Early Adopter Teaching Assistants (TA) in their new leadership and support roles. Sequence:

a. **Syllabus Introduction**: Orient to course structure, topics, supports conducted by TA.
b. **Create ePortfolios**: **Captivate Tutorial** WHO? creates ePortfolio Site from the **Template** provided.
c. **Choose Partners**. Students think about what they need/want in a study partner.
d. **Learn/Practice Hangouts**: **Captivate Tutorial**. Critical for Tech Support / Group Check-Ins.
e. **Group Kick-off**: Introduce **Google Group** for clarification, brainstorming, and practice.
f. **Pre-Survey on Course Topics:** Self-assess SCL / SAMR / GAfE stages.
g. **Homework:** Students will watch **Motivational Video**: Value of Collaborative Cloud, and post responses in **Google Group**.

Online Topics (By Week in Summer Course) and Materials Needed

NOTE: When offered as a full-year course, modules designated "Week 1" would be extended into months, given participation expectations of 8 hours per each of six summer weeks, versus 2 hours per school year week for a four-month semester course.

1. *Early Adopter TA Orientation (Online – Series of Hangouts)*

Title	Components To Develop	Objectives
Planning Meeting	Hangout on Air, Agenda, Syllabus	N/A
Discussion Facilitation Training	Hangout on Air, Video, Google Group	N/A
Orientation Preparation	Agenda, Captivate Tutorials, Hangout on Air	N/A

2. *Learner Cohort Orientation (On Site, By Early Adopters)*

This session, facilitated by the early adopters who will serve as online guides for the course, introduces participants to Hangout format for peer support, to the cohort-based nature of the course (local teachers "reinventing" 1:1 learning together in action research) and to the basic tool fluencies needed to take the course (joining Hangouts, finding course materials, setting up your ePortfolio, time- and self-management for success in an online course). The session concludes with a participant survey to determine experience in prior courses that relate to the material, and self-assessed competence with key technologies,

ending with a self-gauge of commitment to the course and implementation.

Title	Components To Develop	Objectives
Syllabus Orientation	Agenda, Syllabus, Video on Study Habits	N/A
Choose Partners	Google Form	N/A
Learn & Practice Hangouts	Captivate Tutorial	N/A
Group Discussion Kick-Off	Class Google Group	N/A
Pre-Course Self-Assessment	Google Survey, Intro Video	N/A
HW: Motivational Video, Post	Video, Group Post Prompt	N/A

3. *Student-Centered Learning: Week 1*

To establish shared values and commitment, this module will use a comparison of learning theories to argue for the value of student-centered learning for student motivation, personalization, social learning, constructivism, and differentiation. A shared vocabulary will develop from the eLearning module, reflections on readings and online discussions.

The module will include a guided tour of effective technology integration activities by discipline, highlighting **structure** (e.g. cooperative learning), **technology** (e.g. document commenting), **readiness skills** (student and teacher) and **assessment methods** (e.g. artifact examples and rubrics). Each activity will have its own "tour page" on gappsforedu.com including a case study and resources and guides.

This module will explore the benefits and challenges of student-centered one-to-one classrooms, and feature participant sharing of tips and experiences, as well as troubleshooting, using of Google Groups for class discussion.

Title	Components To Develop	Objectives
Constructivist Theory & Practice	Storyline Module 1, Video, Form	I.A.1
SAMR Stages	Video, Group Post, Post Comment	I.A.2
SCL Models	Video, Form Response, Sheet Comment	I.A.3
SCL Challenges & Supports	Hangout, Group Post, Post Comment	I.B.1 – B.2
SCL Adaptation for 1:1	Document Submit, Peer Comment	I.B.3 – B.4

4. *Google Docs, Drive and Groups: Week 2*

Participants will use a Google Group as a discussion board, and a shared Google Drive folder as a shared repository for course materials. These two resources will be used to model activities participants will then conduct in their own Google environments, with their own resources.

Title	Components To Develop	Objectives
Group Creation & Invites	Storyline Module 2, Captivate Video, Group	II.A.1
Shared Drive => My Drive	Captivate, Assignment Template Doc	II.A.2, A.4
Docs Sharing with Groups	Captivate	II.A.3
Group Posting on Docs	Captivate	II.A.5

Document Commenting	Captivate	II.A.6

5. *Classroom and Slides: Week 3*

Participants will use Google Classroom as students of this module, create Classroom instances as teachers with peers as students, and set up Classrooms to be used for a target project or as a standard practice, depending on how frequently they plan to run 1:1 classes. Google Classroom will be positioned in a balanced way, highlighting both strengths and limitations.

Title	Components To Develop	Objectives
Course Creation	Storyline Module 3, Video, Captivate, Form	II.B.1 – B.2
Course Assignment Mgt.	Captivate, Assignment Checklist	II.B.3 – B.5
Slide Rubrics	Storyline Module 4, Rubric Template, Criteria	II.C.1
Slide Deck Creation	Content Outline, Captivate	II.C.2
Slide Commenting & Revision	Captivate, Group Shares	II.C.3 – C.4
Screencasting	Screencastify, Captivate	II.C.5

6. *Forms, Sheets and Grading: Week 4*

Participants will set up "Bell Ringers" and/or "Exit Tickets" using Google Forms. With the addition of Flubaroo, an auto-grading add-on, teachers will explore the ability to assess student readiness for and achievement of learning objectives for a given class, and adjust lesson plans and contact objectives accordingly. Note: The form results create an ongoing record of readiness and performance for each student, along with an opportunity to provide questions and comments to teachers.

Title	Components To Develop	Objectives
Create Assignment Rubric	Storyline Module 5, Criteria, Model	II.D.1
Assignment Review Forms	Rubric, Captivate, Survey model	II.D.2, D.3
Summary of Response Analysis	Captivate, Example	II.D. 4
Text Response Analysis	Captivate, Model, Example	II.D.5
Form Copy & Re-Use	Captivate, Model	II.D.6
Install & Configure Flubaroo	Flubaroo, Response Sheet, Captivate	II.E.1
Grade Sharing & Gradebook	Flubaroo, Captivate	II.E.2
Unit Assignments Feedback	Captivate	II.E.3.
Follow-Up Planning & Survey	Agenda, Post-Course Survey	[Hangout]

Additional Design Strategies for Course Development

The list of strategies discussed below were drawn from research sources cited in the Bibliography, reinforced by performance environment experience of the instructional designer, and informed by the data gathering articulated in the Design

Phase of this document. These recommendations should continue to inform development at a detailed level going forward.

A. Clearly relate applications of technology highlighted in course to subject areas, and use teacher-submitted ideas whenever possible. Examples from interviews:

1. SOCIAL STUDIES and ENGLISH
    a. REFERENCE ARTIFACTS: Display reference artifact on projector screen, students then web-search for comparatives and discuss similarities and differences.
    b. STUDENT LINK SHARING: Use Goo.GL and write on board, or send via Form.
    c. TRANSCRIPTION FROM VIDEO CLIPS: Use YouTube Captioning. Student teams get initial caption and fix grammar (ELA). Teacher uses best transcript for case study.
    d. MANAGING COMPLETION: Students use a form for "I'm done with assignment, working on this [specific thing] now."

B. Instructor Presence / Rapid Feedback important:

1. Feature Interactive eLearning at the start of each module to get past passivity.
2. Host online help hangouts staffed by early adopters using Google Calendar for sign-ups. These need to be "high touch" to compensate for lack of instructor presence.
3. Host weekly course hangouts-on-air, one in afternoon and one in evening, with course-supplied starter agendas, facilitated by early adopters.

C. Culture Change Focus should lead workshop.

The task of making the transition from traditional teaching to teaching with technology is much tougher than it seems. This is because the transition is as much a cultural shift as one of adopting mere methodologies. The transition involves a shift in paradigms, in the way of thinking about teaching. Use images (teacher in front of room) to convey difference.

D. Establish a GAfE Vision Early, both for student benefit and workflow streamlining.

Most teachers do not have a clear understanding of curricular uses of technology within the curriculum. "An important step in achieving meaningful technology use is to develop a vision of how to use technology to achieve important educational goals" (Ertmer, 1999, p. 54). "Teachers lack models showing the value of technology for their own professional use" (Office of Technology Assessment [OTA], 1995, p. 28).

E. Create Personal Time Management Plans during Course

Teachers need time to experiment with computers, share experiences with other teachers, plan and debug lessons using methods that incorporate computers, and attend training and workshop sessions (Ertmer, 1999; Fabry & Higgs, 1997; OTA, 1995).

F. Focus on Student Assessment with GAfE.

Teachers need opportunities to learn strategies for evaluating the results of the implementation of technology in the classroom. Rubrics, electronic portfolios, process oriented feedback, and performance tasks can be used to examine student learning with new technologies (Ertmer, 1999). "Existing standardized measurements of student achievement may not reflect what has been learned with technology." (OTA, 1995, p. 41).

G. Course Activities Should Model Target Instructional Activities

Technology training often focuses on basic operation rather than curriculum integration. Teachers need ongoing opportunities to use technology in ways that model the type of learning experiences we are asking them to create (Ertmer, 1999; Fabry & Higgs, 1997).

H. Build Community for Sharing Models and Coaching

Teachers must be provided with pedagogical support through observation of technology-enriched lessons, curriculums, and classrooms as well as consultation opportunities with experienced mentors in the integration of technology (Brunner, 1992). Research has shown that teachers need both inservice training in the use of technology applications and ongoing curriculum support in order to be able to incorporate technology into the curriculum in meaningful ways (Ertmer, 1999).

I. Apply Prochaska's Stages of Change for Pre-Post Assessment and Design for SCL

ASSESSMENT: Framing the move to SCL as behavior change, determine:

1. What actions should be taken by learners to change behavior;
2. What psychosocial, structural or other determinants and factors make the most difference in the target group's choice to act; and
3. What strategies will be effective in addressing those determinants and factors.

INITIATION: Introduce the key benefits of Student-Centered Learning

Build the awareness that the advantages (the "pros") of changing outweigh the disadvantages (the "cons")—Prochaska calls this decisional balance. Once all learners have indicated their readiness and interest in this process, work through stages.

J. Provide Sufficient Practice for Confidence

Training opportunities need to allow teachers to build skill and confidence in the use of technology (Haugland, 1999).

K. Keep It Simple, but Deal with the What-Ifs

At the practical level, it needs to be understood that teachers operate in tightly constrained environments where there is little time for things to go

wrong, therefore they require their tools to be simple, reliable, durable, and versatile. Suggestions for addressing the practical considerations of high-tech instruction include training teachers to troubleshoot problems and to test in advance.

L. Support Self-Efficacy

To gain the confidence and comfort to adopt this new approach, teachers need to gain a feeling of power and command over it. Use eLearning to help conceptualize and motivate learners, as well as to provide software training and plenty of practice, providing efficacy through accurate readiness assessment. Learners need to know they are making progress. Consider how to reward them? Gamification, okay - but also fixing things they complain about. Building something to their specs. Content curation.

M. Address Beliefs, Assumptions, Attitudes

More than any other single factor, teachers' beliefs influence what they do in classrooms. Teachers hold beliefs about students, teaching, and technology that are imbedded in the powerful images of what they would want to happen if they had ideal conditions. Linking those beliefs to information technology is perhaps the most critical aspect of professional development in this area. Help teachers uncover their personal beliefs about teaching; encourage them to describe their experiences with technology and the assumptions they have about technology, and allow time for reflection.

N. Demonstrate Personalization and Responsiveness

Research from the International Society of Technology Education (ISTE) also reveals that high quality professional development is job-embedded, personalized, and designed to promote skill transfer. Professional learning experiences must respond to teachers' interests, needs, and classroom settings. In many cases, these types of learning experiences can extend beyond the traditional school in-service setting to include webinars, Twitter chats, and other virtual experiences.

O. Identifying compelling best practices / GAfE patterns.

Course Activities will have compelling individual benefits (e.g. personal drive management), or engaging collegial benefits (Group discussions and Wiki document building). Which activities will be explored in the course? How will adoption benefits be forecast and demonstrated?

P. Model gentle instructional management, MOOC and SCL inspired

- MOTIVATION: Start with "Why" before "How" using eLearning and video (example https://www.youtube.com/watch?v=eRqUE6IHTEA)
- READINESS: Assess student readiness for each task, and provide resources and alternatives when readiness is not met. This pre-assessment practice models differentiation in classrooms.

- SIMPLICITY: Stick with the needs implied by the activity. Leave out exploration of other features of tools … but point to resources about these. Use a fresh Google account for simplicity's sake. Good mix of Screencasts and Slides to allow eyes to rest. Slides illustrate (image / diagram) or punctuate (animated bullets) the voiceover.
- GENTLE LANGUAGE, CONTINUAL ENCOURAGEMENT: Do not assume that learners have agreed to give their full attention to the course. Continue to engage and promote benefits.
- TIMING: The course should be tolerant of students falling behind. Minimize deadlines. Where there are deadline, clarify that these are not hard, but those who are late to do complete work will have less of an audience, and consequently less feedback.

Q. Use a consistent ELEARNING STORYBOARD based on
http://uptownzen.org/storyline/

A. **Intro** (non-technical) - how this solves your problem, motivation.
   a. Current Problem / Need
   b. Current Practice / Solution and Match with Need
   c. Problem Analysis of Current Practice
   d. GAfE Solution (no screencast)
      i. How it helps you, your school solve problem
      ii. How it works (very basic)
   e. Think About It - Help answer these questions
      i. LIKELY CONSTRAINTS (What you'll struggle with)
      ii. GAfE AFFORDANCES (Why it's worth it to you)
      iii. SKILLS REQUIRED (What you need to learn)
      iv. CHANGES REQUIRED (What else needs to change)

B. **Demo** (Captivate):
   a. How GAfE Solution Works (Detail)
   b. GAfE Solution Screencast

C. **Training** (Captivate)

D. **Application** (Practicum)

E. Prompts: Reflection on Process / Evaluation of Product. Post onto Forum.

R. Discuss Misbehavior Strategies (where SCL meets 1:1). Key Topics:

Discussion topics include:

Allowing Free Time: What do you do when individual students complete assigned work? Give enhancement work or let them be independent on their Chromebooks? What if they use the time to chat students in other classes? Does this build "good will" or support "bad behavior"? Google Chat is a way students demonstrate that they are not engaged - perhaps directions are unclear? Perhaps content is not a good match? See it as a problem to solve, not a challenge.

Monitoring Student Behavior: Which of these do you do?

- Students face away (so you see screens if you stay put)?

- Wander around and watch?
- Tolerate misbehavior as long as it doesn't distract others?
- Yearn for screen monitoring software?
- Yearn for chat to be turned off?

How do you respond to "quick switch" behavior?

- Impound computer / Warning / PBIS / ….

How important is teacher agreement and enforcement on management? Students adjust to each teacher, even when school norms vary. However, PBIS (Positive Behavioral Interventions & Support) model could be considered.

How do you deal with "first period=first pancake"? (Students in the first period class end up serving as beta-testers, the "first pancake" that doesn't come out as well as others).

S. Learn from Research

To help teacher educators, school leaders, technology facilitators, and staff developers expedite a teacher's transition from a management-oriented to a student-centered laptop classroom:

- **Technology Operations and Concepts:** Plan for adequate technical support and formalize a plan to leverage student technical expertise in response to teacher and peer technical support questions. Promote a collaborative environment wherein teachers are encouraged to ask their peers and students questions.
- **Planning and Designing Learning Environments, Teaching:** While initial professional development may focus on new tools and processes that make classroom management more efficient, teacher training must also include strategies for curriculum integration.
- **Assessment:** Train teachers to alternatively assess non-traditional artifacts of understanding (e.g., projects, collaborations) through such mechanisms as rubrics and portfolios.
- **Enhancing Professional Practice Through Technology:** Ask teachers what professional development they need, but realize early concerns will be on managing classrooms. Ideally, teachers will have access to a technology facilitator and network of peers.
- **Understanding Social, Legal, and Ethical Issues Related to Technology Use:** Establish student expectations through student-parent orientations and acceptable use policies, with contingencies in place for rule breakers.

Phase IIa: Redesign

Introduction

For this pilot project, the roles of subject matter expert, instructional designer and eLearning developer were all played by one person. This limited the integrity possible for each role and each stage associated with ADDIE process, in part because processes failed to terminate in sequence.

While the integration of three closely related roles allowed for an organic process of iterative development, possibly resulting in a higher quality end product, the integration operated like an uninsulated circuit: much more energy was required to move the machine.

At the end of the Design phase, conditions in the performance environment combined with a more educated sense of time required for development necessitated a negotiated shift in the Capstone deliverables. First, it became clear that without a commitment of funds, it would be impossible to develop a pilot course on speculation of sufficient quality to validate the model, even if it might have served teachers in the pilot school better than existing home-grown professional development materials then available.

Capstone project materials were renegotiated to be limited to the following:

1. [Educational Collaborators] Creating a proof-of-concept (with fully-articulated samples of each element) for marketing purposes, so that further development could be funded.
2. [Educational Collaborators] Generating ball-park estimates for funding targets for development.
3. [Personal] Demonstrating eLearning design competence for contracting work.
4. [Personal] Mastering Articulate Storyline, to increase efficiency as well as capacity.

Pilot implementation was abandoned as a goal of the Capstone project. When pilot implementation ceased to a factor, it was initially agreed that two modules would be developed: These were to have been modules with the following purposes and attributes:

- The learner cohort orientation (which would showcase the integration of Articulate, handling eLearning navigation and a template with functional Google Apps elements
- Captivate, for training participants to access course technology, in particular Google Hangouts for live class participation and technical support).

As it turned out, the “uninsulated circuits” between SME, design, and development functions also substantially increased the development time beyond the researched estimate. An Association of Training Development study forecasted 73 development hours per one hour of delivered training, but this research was based on work in professional, experienced environments.

Because development took much longer, the initial plan to develop the orientation module was dropped from the timeline, and fuller focus was given to the first eLearning module covering Student-Centered Learning (Week 1): "Constructivist Theory & Practice", renamed "The SCL Paradigm Shift". While the intent of this first module remained essentially unchanged (considering SCL and its supporting learning theory, Constructivism, without reference to 1:1 implementation), the dominant influence of the SME role led to to a subsuming focus on learning theory, rather than a balance of theory and application, for the first module.

This may be a feature rather than a bug, however, as there will be enough local experience to draw on in course discussions regarding application, as described above, and professional development research (Kopcha, 2012) indicates that it is more effective when teachers learn from each other (job embedded professional development) than from information created out of their context.

An analysis of the process that led to these changes is offered in the Evaluation section; what follows are the revised design specifications that would, in an ideal situation, have been handed off to a developer, rather than evolved through development by one man undertaking three project roles, simultaneously.

eLearning Module Outline: 1a. The SCL Paradigm Shift

1. **Orientation**
    a. Title Slide
    b. Overview (About This Module)
    c. Taking Notes (Introducing Google Keep)
    d. Video Clips (Module Themes)
    e. Video Notes (for copy/paste)
    f. Assumptions about SCL and School Change
2. **3 Learning Theories**
    a. Overview
    b. Summaries of Behaviorism, Cognitivism, Constructivism
3. **Behaviorism**
    a. Overview
    b. Example: The Harlem Success Academy
4. **Cognitivism**
    a. Overview
    b. Detail: Comparison with Behaviorism
    c. * Cognitive Models and Learning (optional)
        i. Memory
        ii. Schema Theory
    d. Brain-Based Learning
    e. Example: The Spire School
5. **Constructivism**
    a. Only one right choice?
    b. Kolb Disclaimer (Experiential Learning # Constructivism)
    c. Four Constructivist Principles
    d. Choosing Constructivism
    e. Example: The Trillium School
    f. Applying Constructivism

6. **Self-Quiz**
    a. Overview: The Quiz through Three Learning Theories
    b. Which Theory? (Drag and Drop)
    c. True or False
    d. Feedback Form
7. **Application to Practice**
    a. Overview
    b. Change is Hard (Layers of Change)
    c. The Paradigm Shift (Prochaska's Stages)
    d. Assignment (for Blog and Google Classroom)
8. **Help Slides**
    a. Template Layout
    b. Course Resources

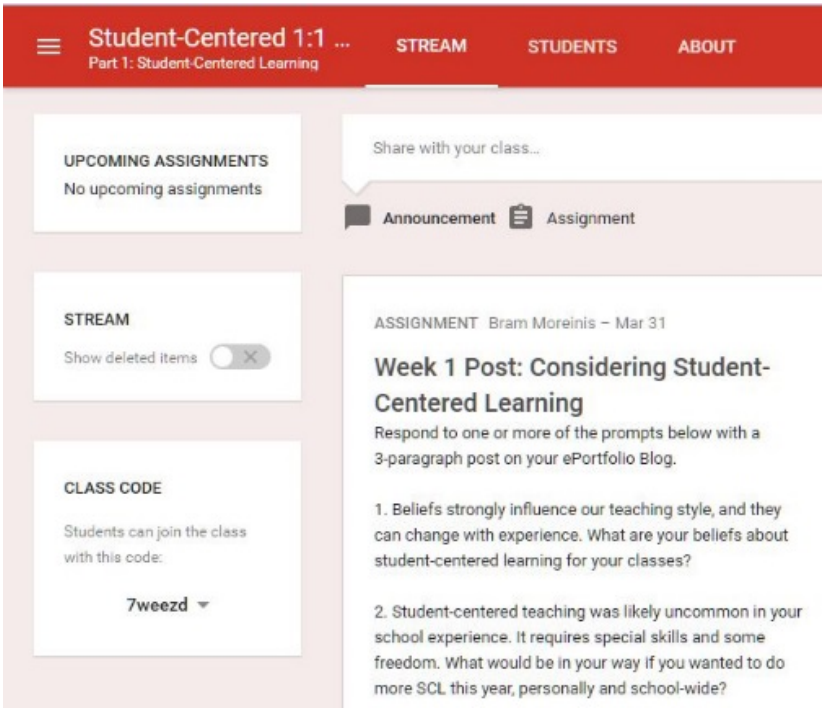
Design Resources

- Storyboard (created with Google Slides): https://goo.gl/Pm5pMg
- Learning Content Management System (resources): http://gappsfored.com
- Detailed Plan (this was not completed): https://goo.gl/d5rIiL

Phase III: Development

At the close of development for Module 1.a, the following materials are complete:

1. Articulate Storyline Module:



   http://btheb.com/mod1
2. Learning Content Management System: http://gappsfored.com/course/scl-11-gafe-pilot
3. Google Classroom (not public, see image at right):

Phase IV-V: Implementation and Evaluation

Formative Evaluation

Formative Evaluators (in order of feedback scope and depth) included:

- Dr. Robert Dillon, Director of Technology, Affton Public Schools
- Lisa Ranghelli, partner.
- Alan Girelli, Capstone Course Advisor, University of Massachusetts / Boston
- Dr. Steven Schatz, Program Advisor, University of Massachusetts / Boston
- Ruth Ronan and Johnathan Banks, fellow UMass/Boston students

Dr. Dillon's evaluation was the most informed and interested, given his deep role in defining the project design and opportunity to use the results. His preferred method, recording voice commentary as he progressed through the eLearning, was a useful innovation, which inspired the idea of using a screencast (so that elements could be pointed to rather than requiring verbal identification). However, that innovation was left untried.

Lisa Ranghelli's evaluation was equally interested, and informed by her work as a director of foundation assessment for the National Committee for Responsive Philanthropy. Lisa has a keen eye for copy editing, the flow and support of propositions, and is alert to shifts in level of detail. She also brought a keen visual sense, developed from her review of video promotional materials for her research.

Alan Girelli and Steven Schatz were available for long conversations about the theory and application of Constructivism, which became the center of gravity for the development phase of the project. The academic community's traditions for defining authorship and succession are particularly important because of the difference between shallow and deep understanding, and because the deep maps of new disciplines in founders and disciples often evolve faster than their published works can convey.

At the same time, practitioners who apply academic theory (for this paper, teachers who adopt the student-centered learning principles called for by Constructivism and others) do not need to grasp that academic depth in order to understand that sympathies exist, and may cobble together applied models that actually suit their contexts and personal views and capacities better than an orthodox commitment to distant thinkers would allow.

These formative conversations with Alan and Steven were fascinating and helped maintain an academically useful theoretical background. However, the pull towards theoretical foundations gave the SME hat perhaps too much license, resulting in awkwardly positioned slides that offered, "You don't really want this level of detail, do you? Click to skip over it."

Last, colleagues Ruth Ronan and Johnathan Banks provided detailed and very useful critiques of the eLearning in earlier stages. While some find it challenging to give and receive formative critique untainted by sugarcoating, it is possible to go through a graduate program with an eye to cultivating relationships with fellow students who are smart, clear-eyed, and with initial encouragement, willing to be efficient with feedback.

Summative Evaluation

The Analysis and Design phases of this project called for and generated reflective conversations among Affton High School teachers and administrators. As hoped, this process helped bring more active consideration and articulation to some hanging issues surrounding the 1:1 adoption process. Of this impact, Dr. Dillon wrote, “It was a great for our learning ecosystem to play a central role in this development process. “

Although full development and implementation of the course would not be a part of this Capstone, the eLearning module which took the primary focus of development seemed potentially useful as a standalone learning object. Capstone Advisor Alan Girelli wrote:

> “This module would be a really useful opening exploration for students in the UMass Boston Instructional Design 614 course I teach, which explores the decade old influence of a cognitivist approach on the field of instructional design. My goal in the course is to undo some of what I believe Bram feels is damage incurred by the departmental focus on a behaviorist model (the traditional model that has driven instructional design for decades).”

Dr. Dillon also arrived at the decision to share the module with his staff and teachers:

> “I really, really like this module. It is the type of deep dive that our teachers need to build common language, shift mental models, and begin to really create a new lens for their adult learning….
>
> I actually gave it to my technology team to review last week. I asked that they absorb it in May, and I'll continue to come back to it. Many of these are still in need of the depth about why they do the things that they do. They are doing the right things by gut, and it is always nice to do the right things with your head and heart.”

This last comment raised a key question: "Nice to do" is not a strong enough argument to cover the time and expense of module development. The instructional designer suggested sharing the module with some of the more student-centered of Affton’s teachers, and then asking them afterward whether they felt they learned anything new and valuable, and foresaw any potential changes to their practice as a result. A follow-up survey after a few months of teaching would validate whether there were any such changes. To this suggestion, Dr. Dillon replied:

> “I like the idea of seeing if the module can impact teaching of those already in the midst of SCL…. I'm going to follow up with my group in a couple of weeks before school ends to see if they watched the module. It is sort of the first time that I've given them an "assignment" to view something like this. I'm interested to see how many folks watch it without prompting.”

The other components of the solution model are as yet untried, but this piece, the Articulate Storyline module, seems to have done the necessary job of providing an engaging and necessary alternative to face-to-face presentation of foundation material.

Improvement Plan

Based on feedback received, the eLearning module followed Rapid Development cycles, with feedback prompting cycles of revision throughout April and early May, and this resulted in a much better product. However, a proper evaluation of the model in full will not be possible until it can be piloted as originally intended.

Questions an implementation can answer about the materials developed include:

1. Will the focus on learning theory help motivate late majority teachers to move from Contemplation to Preparation in adopting Student-Centered Learning?
    a. Compare pre/post survey response regarding adoption stage.
    b. Ask specific question(s) about reaction to learning theory presentations.
2. Is the content depth provided appropriate for the target population?
    a. Do they choose the "go deeper" path to view the Cognitivism Detail slides?
    b. Do they follow the link to the Learning Content Management System to reference supporting research?
3. Will teachers who seek greater content depth take advantage of the Learning Content Management System to reference research and primers?
    a. Use Google Analytics to track visitors from eLearning to LCMS.
    b. Correlate page views with resources referenced in the eLearning.

There are many other questions concerning the specifics of the proposed model, but until further development, there is no need to articulate them here. The general topic of student-centered technology professional development is more ripe for higher education than K-12, given the contrary influence of standards-based test-driven instruction on SCL.

However, is very easy to strike up impassioned and detail-rich conversations with others in the K-12 technology field, both in the US and abroad. There are compelling arguments to be made for both standards-based and student-centered approaches, and it is the application of criterion-referenced standardized testing to teacher and program evaluation that sets the two criteria against each other. In an ideal world, they would co-exist to mutual benefit.

P.S. Discussions have been initiated with the developers of MOOC-Ed at the North Carolina State University College of Education, whose model bears many similarities to this one (see Abstract, Appendix 10). It is expected that development of the proposed solution will proceed in full, either as a project of Educational Collaborators or, over a longer time frame, as a new business product.

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Appendix 1: Clarity Research

http://www.iowaaea.org/what-is-clarity/

A. **Production:** [At Least Weekly %, Monthly %, Every Few Months %, Never %]
   1 Students Write Online: 10,23,3,63
   2 Students Use Online Space for Docs: 73, 3, 7,17
   3 Students Collaborate Online with Students 33,23,13,30
   4 Students Collaborate Online with Teachers 33,23,10,37
   5 Students Use 1:1 In Class: 73 (almost daily),16,3,3,7

B. Assessment: [At Least Weekly %, Monthly %, Every Few Months %, Never %]
   1 Students use Online Testing: 27, 30, 23,20
   2 Students use Online Formative Assessment (Polls): 23,23, 17,37
   3 Students give Peer Feedback in Class: 27,23,10,40
   4 Students give Peer Feedback Online: 10,10, 0, 80

C. **Personalization:** [At Least Weekly %, Monthly %, Every Few Months %, Never %]
   1 What Students learn:
      a Conduct Research: 43,33,13,10
      b Collect and Analyze Data: 17,40,13,30
      c Identify and Solve Authentic Problems: 27,30,13,30:
      d Get Online Info: 40,10,7, 43
      e Cite Online Sources: 32, 34, 21,13
   2 How Students learn it:
      a Online Course Material, 60,17,3, 20
      b Homework Online: 63,10,3,23
      c Online Audio & Video: 37, 20, 13, 30
      d Digital Textbooks: 40,10,7,43
   3 How Students showcase their learning:
      a Present Slideshows: 23,33,17,27
      b Create ePortfolios: 3,23,10,63

Only 10% of teachers reported their students write online at least weekly, 23% monthly. 62% never do. This is significant for the course because writing online is a crucial part of 1:1. How can 50% be doing 1:1 well without this? It is possible that teachers did not interpret "write online" as students creating Google documents. This needs to be clarified.

Almost three quarters of AHS teachers report using 1:1 in classes almost daily. This validates Dr. Dillon's estimate that 50% use 1:1 well, 25-30% use it but not well, and 20% do not use it.

Although Google Forms, used with the Flubaroo add-on, automate testing and formative assessment, only 27% of teachers have students use online testing weekly. This is a powerful opportunity to streamline their work and increase feedback, and should be included in the online course.

Appendix 2: Target Population Interviews.

#	Topic	Question	Purpose
1	PBL Course	If we offered an online class on 1:1 Project Based Learning, would you take it? Why/Why Not?	Closed=>Open. ID Interest
2	1:1 Course	If we offered a class on managing 1:1 classes, would you take it? Why/Why Not?	Closed=>Open. ID Interest
3	Online PD	Have you taken online courses before? What worked well? What did not?	Closed=>Open. ID design.
4	Vision of Good 1:1	Describe a 1:1 lesson you ran that went particularly well. Why does that stand out in your mind?	Open. ID values.
5	Goals for Good 1:1	Describe a 1:1 lesson you heard about another teacher using that interested or inspired you. What did you like?	Open. Get sense of peer shares.
6	Student-Centered Learning	What does "student-centered-learning" mean to you? Are you trying to do more of it in your classes? How is that going?	Open. ID understanding of underlying approach.
7	Behavior Management	In your 1:1 lessons, how do you deal with student misbehavior (going off task, not following directions, breaking the acceptable use policy)? How do other teachers do it? What would make this less of a problem?	Open: Determine barriers and remedies.
8	Important Skills	What do you think the most important skills are for teaching effectively in a 1:1 environment?	Open: Reflection (if there is time)
9	General Tech Dept. Feedback	Is there any advice you would give our Tech Department about how to help more teachers succeed with 1:1 classrooms?	Open: Catch-All inspired by previous questions.

Appendix 3: Course Design Survey

Online Survey: (goo.gl/ZPJ1fy)

Course Design Survey: 20 Questions

We are designing a summer (and future) course that teachers will be compensated to take. The course purpose is to help everyone reach fluency teaching in a student-centered 1:1 classroom using Google Apps. This survey is anonymous. There are 20 questions, grouped in 4 pages of 5. Thank you so much for your focus on this!

Section 1 of 4: What you do now.

One model for an ideal 1:1 classroom builds on Google Apps, student centered learning, and technology integration specific to the subject you teach.

1. The Google skills below can help facilitate a 1:1 classroom. Please rank your experience with each. Exploring = trying out. If not exploring or using, leave blank.

	Exploring	Fluent
Google Classroom	☒	☒
Docs (e.g. Commenting)	☒	☒
Drive (e.g. Managing Folders)	☒	☒
Forms (e.g Creating, Analyzing)	☒	☒
Gmail (e.g. Filtering Mail)	☒	☒
Google+ (e.g Teacher Networking)	☒	☒
Groups (e.g. Student Discussions)	☒	☒
Hangouts (e.g.Guest Teachers)	☒	☒
Sheets (e.g. Formulas, Charts)	☒	☒
Sites (e.g. Class Websites)	☒	☒
Slides (e.g. Presentations)	☒	☒

2. Which of these would you like to explore next? See the list above. If unsure, put a question mark after it.

3. 1:1 supports student-centered learning models. Please rank your prior experience with these. This is not a complete list. Exploring = Trying Out. If term is unfamiliar or not using, leave blank.

	Exploring	Fluent
Case Studies	☒	☒
Cooperative Learning	☒	☒
Discovery Learning	☒	☒
Formative Assessment	☒	☒
Game-Based Learning	☒	☒
Group Projects	☒	☒
Peer Teaching, Peer Review	☒	☒
Problem-Based Learning	☒	☒
Role Playing	☒	☒
Students as Teachers	☒	☒

4. Which of the above student-centered-learning activities have you ALREADY tried WITH 1:1? Refer to the list above. If unsure, add ?.

5. Which of the above student-centered-learning activities would you MOST LIKE TO TRY with 1:1? Refer to the list above. If unsure, add ?.

2 of 4: 1:1 Google Apps Experiences and Goals

This section focuses only on the teaching in a 1:1 configuration, when students use their Chromebooks.

6. Rate: "I use software to manage 1:1 classes (share assignments, give feedback, create tests.)" 1=Never, 2=Rarely, 3=Sometimes, 4=Frequently, 5=Always

1 2 3 4 5

Never ☒ ☒ ☒ ☒ ☒ Always

7. Which of the following activities would you like to try or improve using 1:1? You may recongize these from the Clarity survey you took earlier this year.

☒ Teachers edit and share videos
☒ Teachers post tasks online
☒ Teachers create online tests
☒ Teachers design online projects
☒ Students present slideshows
☒ Students share writing online
☒ Students critique web sources
☒ Students analyze online data
☒ Students solve authentic problems
☒ Students create ePortfolios
☒ Students collaborate online
☒ Students give online peer feedback
☒ Other: ☒

8. Complete this sentence: "A 1:1 model, application or skill I would like improve soon is:" Something other than the list above... Your own words.

9. What change in your practice would help you meet 1:1 standards held for Affton teachers? If you are not aware of any standards or expectations, write "n/a". If you have met all you know of, write "none".

10.Which external support would help you grow faster? Pick the one that would help you most. Use "Other" if necessary.

☒ Principal sets clearer expectations.
☒ Teachers agreed about 1:1 rules.
☒ Increase internet filtering level.

☒ Turn chat off for students.

☒ Give me software to see student screens.

☒ Train students to provide peer support.

☒ None of these.

3 of 4: Improving 1:1 Teaching, Removing Barriers

This section will help determine interest in the class we are developing. We will also explore other changes that could help more teachers move forward with 1:1 teaching.

12. Rate your interest in taking an online course for 4 weeks this summer (6hrs/wk), if compensated.

	1	2	3	4	5	
Not Interested	☒	☒	☒	☒	☒	Very Interested

11. If you are not yet using 1:1 regularly or comfortably, pick UP TO THREE barriers below that are slowing you down.

☒ No barriers - all good!

☒ I don't have home Internet.

☒ Other school pressures take precedence.

☒ I just don't like computers.

☒ I think computers are harmful.

☒ I get stuck when things go wrong.

☒ I have other priorities.

☒ I am isolated by my schedule.

☒ I don't have time to experiment.

☒ If lessons go poorly I feel I have failed.

☒ Students have too much power with computers.

13. Rate your interest in taking an online course with other teachers to share tips and tricks and discuss approaches.

	1	2	3	4	5	
Not Interested	☒	☒	☒	☒	☒	Very Interested

14. Rate your interest in taking an online course to learn how to design Project-Based Learning units for 1:1 classes.

1 2 3 4 5

Not Interested ☒ ☒ ☒ ☒ ☒ Very Interested

15. Rate your interest in taking an online course to learn how to manage 1:1 classes, including with Google Classroom.

	1	2	3	4	5	
Not Interested	☒	☒	☒	☒	☒	Very Interested

4 of 4: Designing Our Online Course

This section will focus on specific design elements for the online course, and provide a clear sense of which overall topic to focus on first.

16. Complete this sentence: When online courses don't work for me, it is usually because....

17. Which of these design elements would you want to see in the next online course you take? NOTE: These are in mutually exclusive pairs! Read carefully.

☒ Start with the basics
☒ Assume we know the basics
☒ Flexible Schedule (go at own pace)
☒ Regular weekly schedule (all together)
☒ Everyone learns the same thing together
☒ Separate sections based on learner needs
☒ Optional after-school Hangouts
☒ Optional evening Hangouts
☒ Use Google Classroom as Home Base
☒ Use Schoology as Home Base

18. Which of these ideas would you like your next online course to use? NOTE: These are NOT in pairs. Chose whichever ones you like! Use "Other" if needed.

☒ Searchable web manual of all info used
☒ Attend with other members of my team
☒ Give examples of completed assignments
☒ Give expanded directions via screencasts
☒ Provide follow-up coaching in school
☒ Priority tech support for course learners

☒ Choose tasks with immediate application

☒ Promote peer collaboration and support

☒ None of these

☒ Other: ☒

19. Pick the course you would take, if you had to pick one.

☒ Google Classroom for 1:1 Management.

☒ 1:1 Management: Assigning, Commenting, Testing, Grading.

☒ Student-Centered 1:1 Learning with Google.

☒ Project Based 1:1 Learning with Google.

☒ Making Google Sites for Classes and Projects.

20. If you are interested in the online course: What subject(s) do you teach? This will help us ensure that there are activities specific to your subject.

☒ Math

☒ English

☒ Social Studies

☒ Science

☒ Other: ☒

21 If you checked a box above: Specifically, what subject? For example, if Science: Biology? Chemistry?

Appendix 4: Focus Groups

FACILITATORS: Robert Walker, Brian Esselman, Affton HS Teachers

OBJECTIVE: Develop a shared narrative about the process of moving from teacher-centered to student-centered classroom management.

COMPOSITION: A teacher-facilitator and group of 6-10 teachers from **each of these groups**:

- **"Naturals"**: Teachers who teach SCL **naturally**
- **"Converts":** Teachers who made the SCL transition **PRE-1:1** (no computers involved)
- **"1:1 Converts"** Teachers who made/are making the SCL transition **as part of 1:1**

FACILITATOR: A neutral third party with experience in group facilitation, skilled at probing participants' answers. Reacts in real time to the dynamics and nurture it into productive focus.

SETTING: A round table (or circle of chairs) **with food and coffee** (for a 1:30 meeting).]

PROCESS:

1. **PREP:** Setup room with recorder, coffee & food, flipchart / whiteboard. Test audio.
2. **FOCUS GROUP**: Follow the outline on the next page, in your own conversational tone.
3. **CLOSING**: At close of meeting, take a photo(s) of flipchart / whiteboard notes and email it to Bram, along with MP3 recording of the meeting. Include email addresses of all teachers attending so that notes can be emailed to them.

INTRODUCTION (conveyed by facilitator)

1. **Facilitator Role:** My role is only to guide discussion, probe for deeper answers, and record important data for research, in addition to the audio recording.
2. **Group Member Role:** Your group role is to uncover experiences, feelings and issues and to discover deeper answers by listening and responding to each other.
3. **Boundaries:** It is okay to get negative. What I record will be anonymous when transcribed. You will all receive a copy of the notes I will send to our course designer as a Google Doc, and can comment on anything you feel was not accurately reflected.
4. **Why SCL with 1:1? Go round or review.**
5. Student Centered Learning (SCL) is an ideal match for 1:1 because…..
6. With good SCL, there are fewer discipline problems with 1:1 because….
7. There is still a role for teacher-centered learning, but it is reduced.
8. **What is SCL?** Go round **with someone taking notes on flip pad or whiteboard**.
9. **Reports By Teacher SCL Situation**

INTRO: We are planning an online course to support teachers in making the shift from teacher-centered to student-centered learning. We will consider three perspectives:

1. **SCL Naturals:** Teachers who have always used SCL, or done so for many years.
2. **Pre-1:1 SCL Converts:** Teachers who moved to SCL before 1:1.
3. **1:1 SCL Converts:** Teachers who are moving to SCL as part of 1:1.

NATURALS: Who teaches like this naturally? Anyone may jump in.

- What values and assumptions lead you to SCL?
- What would a random visitor experience in your classroom?
- Describe an example or two of what works particularly well.
- What are your growing edges as a SCL teacher?

CONVERTS: Who made the transition PRE-1:1 (no computers involved)?

- Why did you do it?
- What was easy and how did it feel?
- What was hard and how did it feel?
- How did you solve the hard parts?
- What trade-offs have you accepted?
- What are your growing edges?
- Advice to new people making this transition?

1:1 CONVERTS: Who made the transition as part of 1:1?

- Why are you doing it?
- What has been easy and how did it feel?
- What has been hard and how did it feel?
- How are you solving the hard parts?
- What trade-offs have you accepted?
- What are your growing edges?
- Advice to new people making this transition?

Appendix 5: Technology Leadership Meeting

Meeting Goal: Orient administrators to support SCL 1:1 classrooms, consider options.

ORIENTATION: Student-Centered Learning in a 1:1 Environment - Bob

1. **Why Adopt Student Centered Learning for 1:1 Classrooms?**
    a. SCL and 1:1 are mutually supportive.
    b. With good SCL, fewer 1:1 discipline problems.
2. **What does SCL with 1:1 Look Like?**
    a. Pedagogy: Examples
    b. Technology: Examples

REPORT: Analysis and Survey Results - Bram

A. ANALYSIS: Where is Affton at?
- 1 Framework: Competency + Level (1.Not Exploring=>2. Exploring=>3.Fluent)
    - a SCL Paradigm Shift
    - b 1:1 Classroom Management
    - c Project-Based Learning (PBL)
- 2 Findings
    - a Clarity Survey: Highlights | Full
    - b Course Design Survey: Highlights | Full
    - c Research on Principal Involvement: Highlights

B. BRIEFING: Online Course Plan
- 1 Goals: Target "Late Majority" (Rogers)
    - a Move from Exploring to Fluent (1.1=>1.2) in SCL
    - b Move from Exploring to Fluent (2.1=>2.2) in 1:1 Management
    - c Move into Exploring (3.0=>3.1) in 1:1 SCL PBL
- 2 Teacher Preferences
    - a Asynchronous (not possible in Summer)
    - b Mentor Supports ("Early Adopters")
    - c Match to Subject Area and Skill Levels
- 3 Full Plan
    - a Intensive Pilot: Humanities: 6 hrs/wk
    - b Fall Course: STEM +: 2 hrs/week
    - c Orientation (June), Course (August), ADDIE (2015-16), Summer

C. DISCUSSION: Leadership Roles and Next Steps
- 1 Instructional Leadership Roles
- 2 Building-Level Technology Planning

Appendix 6: Project-Based Learning Course Topics

I. Student-Centered Project Based Learning Units with ADDIE: The Technology

a. *Webquest Project Re-Envisioned as Game-Based Learning*
b. *Case Studies with Closed-Captioned Videos.*
c. *Project Development with Google Site Templates*
d. *Combining Teacher-Selected and Student-Searched Resources*
e. *Applying ADDIE to Webquest Project Development*

II. Student-Centered Project Based Learning Units with ADDIE: The Pedagogy

f. *Cooperative Learning: Group Concept Maps with Draw*
g. *Group Projects: Groups of 4 enable peer-activity switches.*
h. *Jigsaw: Students develop slide presentations on Concept topics*
i. *Peer Review: Students use checklist to review each other's slides.*
j. *Students as Teachers: Slide Presentations with Response Forms*

Module 1: Tour: Student-Centered Project Based Learning with Google Apps *A guided tour of exemplary projects by discipline, highlighting structure (e.g. cooperative learning), technology (e.g. document commenting), readiness skills (student and teacher) and assessment methods (e.g. artifact examples and rubrics). Each resource will have a "tour page" on gappsforedu.com including a case study and resources and guides.*

Module 2: 1:1 Project Based Learning with Google Apps: Approach: *The biggest differences between the performances of typical and expert PBL teachers include:*
Collaborating with peers (Inter-grade / Interdisciplinary design partner & team discussions)
Class norms include self-evaluation, process reflection (Responsive. Classroom / Formative Evaluation)
Providing self-monitoring guidelines for students (Rubrics, Process Guides)

Module 3: 1:1 Project Based Learning with Google Apps: Independent and Peer Work with Reflection Posts, Status Forms, Artifact Rubrics and Process Guides: *Check-In forms are used at the start of independent work. Students declare where they are at in the process and what they will be doing. These can be used sequentially as each step is completed. Checklist forms enable peers to help each other meet performance criteria before moving to the next step. Student can also use Personal Project forms to keep track of a process long-term, if they have "edit my response" links. We will look at examples and how to use them.*

Appendix 7: Guide for Early Adopter Planning Hangout

GOAL: PLAN COURSE SUPPORT with early adopters (and technology director, 1:1 coordinator and assistant principal): Develop support plan for course.

1. Group Hangout Facilitation
2. Individual Hangout Support
3. Other Brainstorming

COMPOSITION: Early adopters, technology director, 1:1 coordinator (+ assistant principal?).

FACILITATOR: Neutral third party with experience in group facilitation and skilled at probing participants' answers. React in real time to the dynamics and nurture it into productive focus.

INTRODUCTION (conveyed by facilitator)

A. **Objectives:** Articulate shared understandings, discover needs and brainstorm ideas to develop a support plan for the upcoming online course pilot, focused on helping teachers learn to adopt student-centered blended learning as part of our 1:1.

B. **Next Steps:** You will all receive a copy of the notes I will send to our course designer as a Google Doc, and can comment on anything you feel was not accurately reflected.

MEETING OUTLINE

A. INTRO (see Above)

B. COURSE PLAN (Presentation)

1. **Setup:** Everett Rogers described the diffusion of innovation along four stages, which we are applying to 1:1:
    a. Early Adopters (you)
    b. Early Majority (those who learn from peers and are doing well)
    c. Late Majority (those who are struggling and stuck)
    d. Laggards (those who will not make the effort unless forced to).
2. **Course Goal** is to bring all "late majority" (teachers who are attempting 1:1 now but with difficulty) to effective practice, along three stages:
    a. 1:1 Classroom Management with Google Tools (incl. Classroom)
    b. Student-Centered Learning Management with Google Tools
    c. Student-Centered Learning Unit & Project Design
3. **Design Goal** is to have no active instructional presence. Online course will provide resources, videos, assignments, and tools, but all interactions will be peer-to-peer. Examples: Peer review of assignments, peer support for troubleshooting.

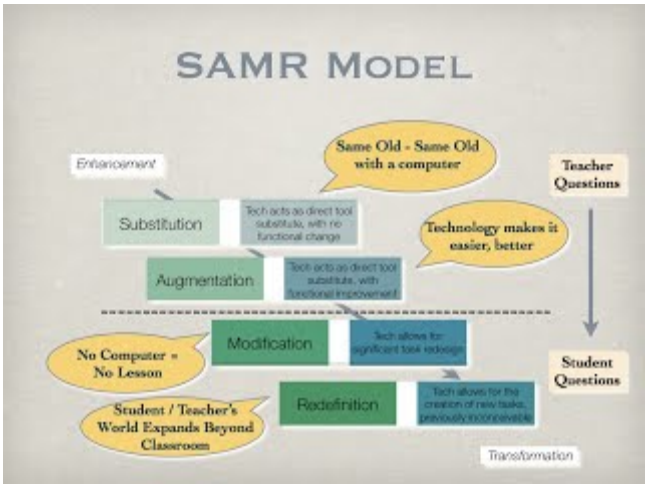
4. **Support Plan:** For this course design, “Early Adopters” are teachers who have taken student-centered blended learning with 1:1 further than anyone else here, and thus can provide guidance. You are not viewed as local leaders.

C. SUPPORT PLANNING (Discussion)

1. **Intro:** We are going to consider various ways you can make the online course easier for teachers who struggle with online learning, and provide guidance through stories of your own experiences and discoveries.
2. **Group Hangout Facilitation**:
    a. In surveys, teachers said they need human contact, not just written instructions. They also said they want to learn from other teachers what works, share successes and issues.
    b. We would like to hold 2 hangouts per week during August, one in the afternoon, and one in the evening.
    c. For each week, there would be a very brief online: a tech topic, a topic related to the assignment, and then open Q&A.
    d. Week by week, who can take responsibility for facilitating (setting up Hangouts on Air for recording, providing guidance to attendees to share screens, etc.)? Use referenced Planning Sheet to sign up.
3. **Individual Hangout Support:**
    a. In surveys, teachers expressed frustration when they get stuck on a tech issue and can’t make course progress until an instructor gets back to them, often 3 days later.
    b. Teachers will be experiencing difficulty and need to share their screens as they show what they struggle with.
    c. Who can take responsibility for responding to support requests within 1-2 days, helping teachers use screen sharing? Which weeks could you sign up for?
4. **Other Brainstorming:**
    a. In surveys, teachers expressed a lack of time to experiment or get one-on-one support as they learn.
    b. How else can early adopters help during an online course? Let’s brainstorm. Starter examples:
        a) Moderate forum discussions
        b) Respond to Q&A forum requests

Appendix 8: SAMR Model

Retrieved from: sites.google.com/a/msad60.org/technology-is-learning/samr-model
Developed by Dr. Ruben Puentedura



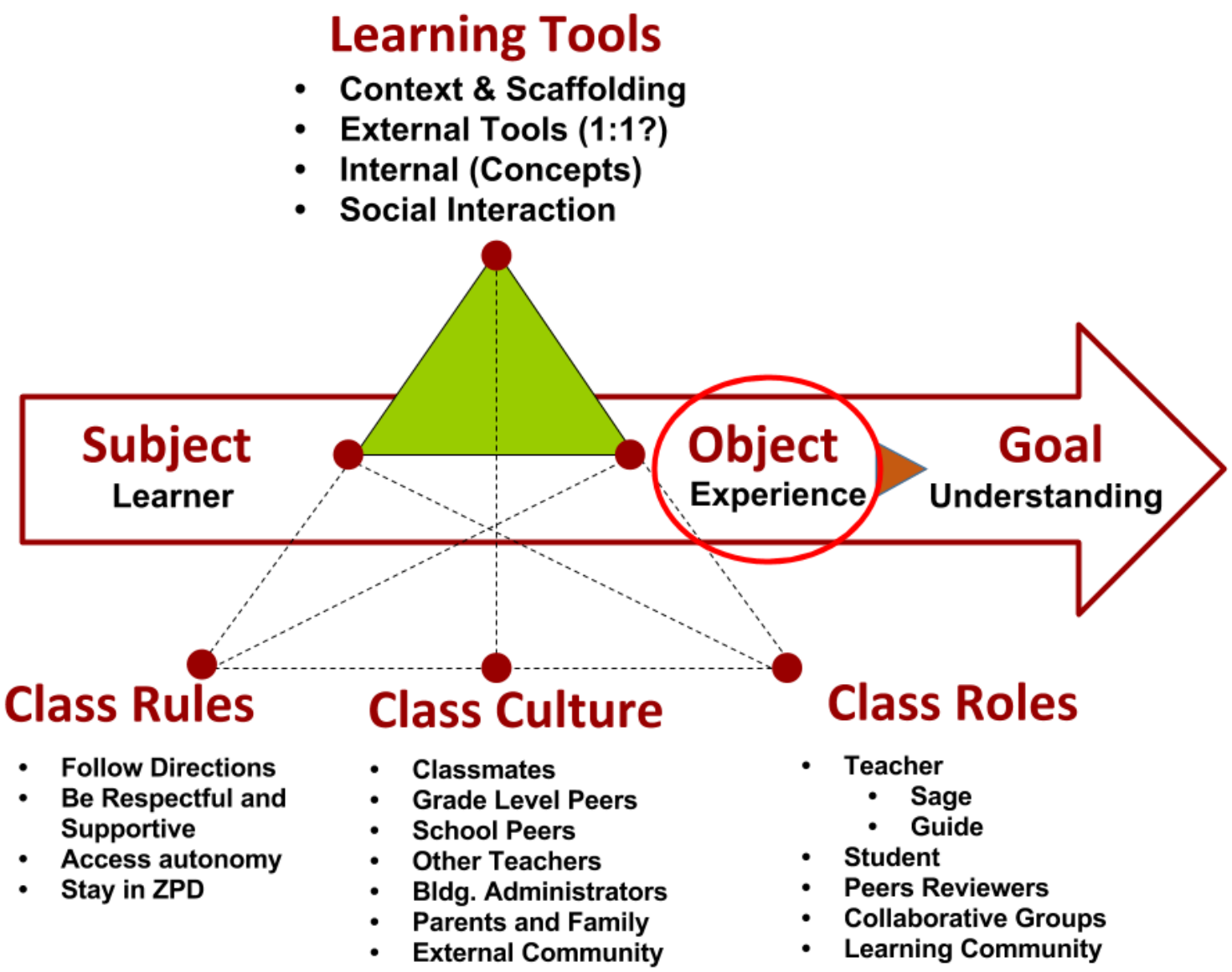
The **S**ubstitution **A**ugmentation **M**odification **R**edefinition Model offers a method of seeing how computer technology might impact teaching and learning. It also shows a progression that adopters of educational technology often follow as they progress through teaching and learning with technology.

While one might argue over whether an activity can be defined as one level or another, the important concept to grasp here is the level of student engagement. One might well measure progression along these levels by looking at who is asking the important questions. As one moves along the continuum, computer technology becomes more important in the classroom but at the same time becomes more invisibly woven into the demands of good teaching and learning.

Level	*Definition*	*Examples*	*Functional Change*
Substitution	Computer technology is used to perform the same task as was done before the use of computers.	Students print out worksheet, finish it, pass it in.	No functional change in teaching and learning. There may well be times when this the appropriate level of work as there is no real gain to be had from computer technology. One needs to decide computer use based on any other possible benefits. This area tends to be teacher centric where the instructor is guiding all aspects of a lesson.

Augmentation	Computer Technology offers an effective tool to perform common tasks.	Students take a quiz using a Google Form instead of using pencil and paper.	There is some functional benefit here in that paper is being saved, students and teacher can receive almost immediate feedback on student level of understanding of material. This level starts to move along the teacher / student centric continuum. The impact of immediate feedback is that students may begin to become more engaged in learning.
Modification	This is the first step over the line between enhancing the traditional goings-on of the classroom and transforming the classroom. Common classroom tasks are being accomplished through the use of computer technology.	Students are asked to write an essay around the theme "And This I Believe...". An audio recording of the essay is made along with an original musical soundtrack. The recording will be played in front of an authentic audience such as parents, or college admission counselors.	There is significant functional change in the classroom. While all students are learning similar writing skills, the reality of an authentic audience gives each student has a personal stake in the quality of the work. Computer technology is necessary for this classroom to function allowing peer and teacher feedback, easy rewriting, and audio recording. Questions about writing skills increasingly come from the students themselves.
Redefinition	Computer technology allows for new tasks that were previously inconceivable.	A classroom is asked to create a documentary video answering an essential question related to important concepts. Teams of students take on different subtopics and collaborate to create one final product. Teams are expected to contact outside sources for information.	At this level, common classroom tasks and computer technology exist not as ends but as supports for student centered learning. Students learn content and skills in support of important concepts as they pursue the challenge of creating a professional quality video. Collaboration becomes necessary and technology allows such communications to occur. Questions and discussion are increasingly student generated.

Appendix 9: Sample Activity Diagram



Appendix 10: MOOC-Ed Abstract

Going to Scale with Online Professional Development:
The Friday Institute MOOCs for Educators (MOOC-Ed) Initiative

Glenn M. Kleiman and Mary Ann Wolf
Friday Institute for Educational Innovation North Carolina State University College of Education

Abstract

The Friday Institute's Massive Open Online Courses for Educators (MOOC-Eds) initiative builds upon our prior work designing, implementing and researching small cohort, facilitated online workshops through the EDC EdTech Leaders Online program and online professional learning communities, cohorts, and courses at the Friday Institute. This initiative was designed to explore whether MOOC-like approaches could be adapted to:

- Address the professional development needs of many educators—teachers, instructional coaches, and school and district administrators;
- Incorporate research-based principles of effective professional development;
- Provide scalable, accessible, cost-effective professional development.

Beginning in 2012, we launched a set of MOOC-Eds for district and school leaders and educators. These MOOC-Eds build upon four major design principles that reflect research-based practices for educators' professional learning: multiple voices, self- directed learning, peer-supported learning and job-connected learning.

We then developed *instructional elements*—specific things that participants use and do--that instantiate these principles in the courses. We have an active research program, using the extensive data available to explore participants' self-directed learning paths, interaction patterns for peer-supported learning, the value of different types of resources and activities, and the impact of MOOC-Eds on participants' knowledge and practices.

This chapter will summarize what we have done and learned so far, with an emphasis on design principles and how they are incorporated into specific instructional elements within the MOOC-Eds and the State of North Carolina.

MOOC-Ed Design Principles

We set out to explore developing online professional learning experiences that were related to other MOOCs in that they serve large numbers of educators (although not nearly as large as some MOOCs), are open to all interested participants, are delivered online, and are structured like a course to provide content and activities in defined time periods. However, the Friday Institute MOOC-Eds have a set of characteristics that make them different from MOOCs designed for other audiences and purposes:

- The MOOC-Eds are designed to help adult educators meet their professional learning needs, so we assume that participants are literate, motivated, and self-directed learners.
- We value the experience and expertise of the participants and design ways in which they can share what they know and further the learning of others.
- While we do have defined requirements for participants who desire continuing education units (CEUs), we do not have grades or formal tests. Therefore, we do not have to address concerns about test security and integrity that MOOCs providing course credit have to address.
- We emphasize establishing professional connections among participants. Participants are identified in all their comments and projects; we do not allow for anonymous postings or project feedback.
- We recommend participating in the MOOC-Eds with colleagues and engaging in local discussions to relate the MOOC-Ed experience to one's own context.
- Our focus is on participants reaching their own goals that they articulate when registering for the course, not on goals we set or on completion rates.

Another important factor is that our approach is designed in accordance with the research-based principles of effective professional development ((Darling-Hammond, Wei, Richardson & Orphanos, 2009) and online learning (iNACOL, 2011), which we incorporate into four major design principles for MOOC-Eds:

1. ***Multiple voices***, so that participants learn about the perspectives of other teachers and administrators along with those of students, researchers and experts in the field. MOOC-Eds are purposefully *not* designed around one or two experts who present online lectures. They are about a rich set of perspectives presented within the context of activities and exchanges that reflect the additional design principles described below.
2. ***Self-directed learning***, so that participants can personalize their experience by identifying their own goals, selecting among a rich array of resources, and deciding whether, when, and how to engage in discussions and activities to further their own learning and meet their goals.
3. ***Peer-supported learning***, through participants engaging in online discussions, reviewing each others' projects, rating posted ideas, recommending resources, crowdsourcing lessons learned, and participating in twitter chats and other exchanges appropriate to the individual course.
4. ***Job-connected learning,*** through the use of case studies, classroom and school related projects; developing action plans; and other activities that center participants' work on critical problems of practice and data-informed decision making in their own classrooms, schools or districts.

These design principles connect well with the four major themes of this volume.

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CURRENT WORK

Consultant, Empowered Teacher: 2009-Present
Software: Articulate, Captivate, Camtasia, Google Apps, Dreamweaver, Moodle, Blackboard, etc.
Recent Courses: Building Social-Emotional Health, Tech for Teachers, Google Apps for Schools

Consultant, Educational Collaborators: 2011-Present
Web development, course design and technology consulting with school-based educators.

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- **Technology Integration Specialist,** Caledonia Schools, VT: 2011-2013
- **Principal,** Game Face Web Design, LLC**:** 2005-2009
- **Technology Coordinator,** Taconic Hills Central Schools, NY: 2003-2005
- **Computer Science Teacher**, Hudson City Schools, NY: 2001-2003
- **Director of Technology,** Poughkeepsie City Schools, NY: 1997-2001
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