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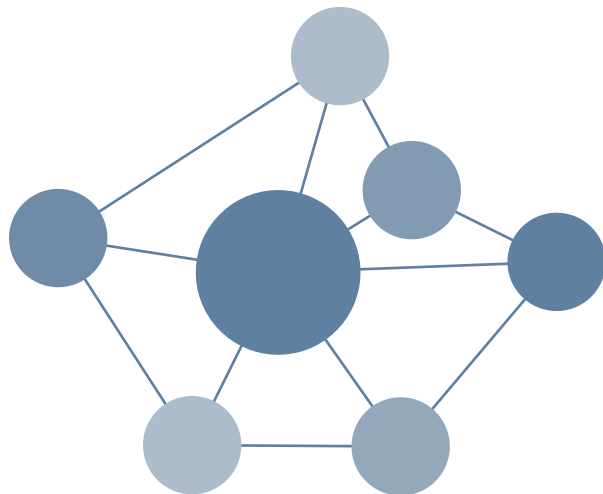
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IMPROVING ONLINE COLLABORATIVE LEARNING FOR TEACHERS:

How Changes to Design Features of the Adolescent
Literacy Collaboratory Influenced Participant Retention,
Overall Satisfaction, and Engagement



Allison Brettschneider and Mary Anne Mather

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How Changes to Design Features of the Adolescent Literacy Collaboratory Influenced Participant Retention, Overall Satisfaction, and Engagement

■ Abstract

Key elements of effective teacher development include a focus on curriculum and job-situated problems, hands-on opportunities to apply learning, and collaboration among teachers (Garet, Porter, Desimone, Birman, & Yoon, 2001; Hiebert, Gallimore, & Stigler, 2002; National Staff Development Council, 2001). Program developers at The Education Alliance at Brown University drew upon these principles to create the Adolescent Literacy Collaboratory, a yearlong professional development initiative for secondary school teachers. The goal is to help science, mathematics, social studies, and English/language arts teachers integrate effective adolescent literacy instruction into their content-area classes. The Collaboratory is designed to provide opportunities for collaboration among teachers, a literacy expert, and content-area coaches through a blend of online and face-to-face activities. In this paper, we describe the Collaboratory design, discuss key design changes between the first and second years of implementation, and examine the levels of participant retention; overall satisfaction with the Collaboratory as a learning experience; and engagement with content, literacy experts, and peers. The purpose of this study was to generate useful preliminary evidence about whether the design adjustments were headed in the right direction and thus guide further refinements to the Collaboratory.

■ INTRODUCTION

■ Supporting Collaborative Professional Learning

Long-term professional development can be powerful when it taps teacher expertise and engages groups of teachers in solving problems directly related to their practice. Activities that focus on curriculum, provide hands-on opportunities to apply learning, and involve collaboration among teachers can contribute to lasting instructional improvement (Garet, Porter, Desimone, Birman, & Yoon, 2001; Hiebert, Gallimore, & Stigler, 2002; National Staff Development Council, 2001). However, without an established culture of collaboration, activities like these can be difficult to develop and sustain. The challenge is amplified when teachers need professional development on an issue about which there is little in-school expertise. Consequently, teachers benefit when their professional learning is tailored to school-based needs yet enriched with new knowledge and perspectives that come from sources beyond the school (Lieberman, 1995).

Interactive technologies help address these challenges by supporting alternatives to face-to-face professional development. In recent years, increasing numbers of educators have begun to explore the potential of these technologies as supports for collaborative learning (Bonk, Hansen, Grabner-Hagen, Lazer, & Mirabelli, 1998; Bonk, Daytner, Daytner, Dennen, & Malikowski, 2001; Davis, 2004; Derry, Seymour, Steinkuehler, & Lee, 2004; Riel & Polin, 2004). To investigate how online learning can address the critical needs of middle school and high school educators, The Education Alliance at Brown University, with support from the Northeast and Islands Regional Educational Laboratory (LAB), developed the Adolescent Literacy Collaboratory, a yearlong professional development initiative for secondary school teachers who seek to improve literacy instruction. The Collaboratory draws together interdisciplinary teams of teachers (science, mathematics, social studies, and English/language arts) from different schools to learn from literacy experts and one another.

The Collaboratory provides opportunities for collaboration among teachers with the intention of supporting an online learning community—a group of people who use interactive technologies to work toward common learning goals (Riel & Polin, 2004). Online learning communities are based on social theories of learning that view “intellectual development” as “a process of negotiation of meaning in everyday practice with others” (Riel & Polin, 2004, p. 17; Lave & Wenger, 1991; Wenger, 1998). However, purely online learning can feel impersonal for individual participants, who may not be as motivated to interact and complete learning tasks as they might in groups that meet face to face (Young, 2002; Garnham & Kaleta, 2002). Therefore, the Collaboratory was designed as a hybrid learning experience, a blending of online activities with face-to-face interaction. With a facilitator and coaches guiding the collaborative learning of the group online, and school teams meeting face to face to observe and discuss their school-based work, participants are encouraged to share their insights and experiences.

In this paper, we describe the Collaboratory design and discuss key design changes between the first and second years of implementation. Following a structure based on design research studies (Collins, Joseph, & Bielaczyc, 2004; Shavelson, Phillips, Towne, & Feuer, 2003), we first describe the overall goals and elements of the Collaboratory design. We then discuss the design changes in recruitment, participant orientation, structure of online and face-to-face activities, and support mechanisms. Our study focused on the levels of participant **retention**; overall **satisfaction** with the Collaboratory as a learning experience; and **engagement** with content, literacy experts, and peers. Our purpose in this study was to provide preliminary evidence about the efficacy of these changes and thus guide further refinements to the design.

■ Goals and Elements of the Design

Our primary long-term goal is to develop a job-embedded, technology-supported professional development experience that helps teachers to improve their practice. The Collaboratory is designed to focus on a priority topic over an extended period of time. We chose adolescent literacy as the topic for the Collaboratory because it is a growing national concern and responsibility (Dillon, 2005; Biancarosa & Snow, 2004). Yet in many cases, content-area reading and writing instruction has not been a significant part of pre-service or in-service training for secondary school teachers. Additionally, many educators view literacy instruction as an elementary school responsibility, believing that secondary school teachers should focus only on teaching content (Meltzer, 2002). However, without strong literacy capabilities, students have little chance of meeting state standards and successfully performing on tests required by the No Child Left Behind Act (NCLB).

To address these challenges, the Adolescent Literacy Collaboratory helps teachers integrate research-based literacy strategies directly into their science, math, social studies, and English/language arts lessons. In providing hands-on, long-term, collaborative professional development, our goal is to support teachers as they help their students negotiate the complex literacy challenges required to master secondary school content. Technology provides access to external literacy expertise and research-based strategies; it also offers a venue for collaborative discussion about teaching practice.

Basic Design Elements of the Adolescent Literacy Collaboratory

The Collaboratory design is rooted in the principle of collaborative inquiry, in which colleagues participate in a process of negotiating meaning that propels them to deeper levels of understanding about their practice. “Collaborative inquiry asks that school-based practitioners locate, create, and analyze knowledge that makes sense for their own context and situation” (Mather, 2001, Step 1, p. 3). In addition, the Collaboratory brings external insights and expertise to practitioners.

A combination of online and face-to-face activities supports this process and includes: a face-to-face orientation; yearlong, asynchronous interaction online; periodic on-site team meetings; and a culminating face-to-face “critical friends” meeting. Participants build their knowledge through conversations with same-discipline and cross-discipline colleagues online, as well as with cross-discipline “Literacy Team” members during the face-to-face meetings at each school.

The design is further supported by research on professional learning communities, which shows that teachers learn through the use of shared artifacts, tools, and resources (Lehtinen, 2003) and through social interaction (Lave & Wenger, 1991; Wenger, 1998). Applying this to the Collaboratory, activities are designed to promote social interaction among teachers as they engage with (1) resources that explain and illustrate research-based literacy strategies and (2) artifacts such as their lesson plans and videotaped lessons. This is supported by an online facilitator who is a literacy expert and content-area coaches with literacy expertise.

Applying this to the Collaboratory, activities are designed to promote social interaction among teachers as they engage with (1) resources that explain and illustrate research-based literacy strategies and (2) artifacts such as their lesson plans and videotaped lessons. This interaction is supported by an online facilitator and content-area coaches with literacy expertise.

According to the literature, job-embedded collaborative activities can range “from interdisciplinary teaming (Whitford & Kyle, 1992) to curriculum development and critique (Bryk, Rollow, & Pinnell, 1996; Miller, 1992) to collaborative action research (Eaker, Noblit, & Rogers, 1992) to study groups (Hodges, 1996)” (*Professional Development, Research Summary*, The Knowledge Loom). In alignment with this research, the developers have incorporated a variety of activities to tap participants’ expertise and interest.

Specifically, participants read about, discuss, and experiment with new instructional strategies and teaching tools related to literacy development. Then they develop, teach, and critique content-area lessons that incorporate these strategies and tools. They receive feedback from the online facilitator, coaches, and colleagues both before and after teaching the lessons. Lesson observations and discussions also occur among colleagues at the local sites and via lesson videos sent to the facilitator and the coaches.

Overall, the Collaboratory is informed by principles of high-quality professional development, which call for ongoing, job-embedded, collaborative learning opportunities that draw upon the experience of practitioners as well as content experts. See Table 1 for a description of specific Collaboratory design elements and how they correspond to these principles of effective professional development.

TABLE 1: PROFESSIONAL DEVELOPMENT PRINCIPLES & COLLABORATORY DESIGN ELEMENTS

Principles of Successful Professional Development*	Corresponding Collaboratory Design Elements
<p>Professional development should provide learning opportunities that relate to individual needs but are, for the most part, organized around collaborative problem solving.</p>	<p>Participants report on their literacy instruction experiences, identify challenges, and note similarities across sites.</p> <p>Participants select research-based literacy strategies to support content-specific objectives in their classrooms and seek input from colleagues before and after experimentation.</p> <p>Site-based interdisciplinary Literacy Team members observe and critique one another’s lessons.</p> <p>Site-based Literacy Teams hold periodic meetings to discuss lesson reflections, set common goals, and expand literacy strategy experiments to other content areas.</p> <p>Participants strategize ways to sustain literacy learning beyond the Collaboratory during the culminating critical friends meeting.</p>
<p>Professional development should be primarily school-based and built into the day-to-day work of teaching.</p>	<p>Participants experiment in their own content-area classrooms with research-based literacy strategies selected from Collaboratory resources.</p> <p>Participants develop a series of content-area lessons that incorporate literacy strategies to support student interaction with and understanding of content-specific concepts, standards, and curriculum.</p>
<p>Professional development should be continuous and ongoing, involving follow-up and support for further learning, including support from sources external to the school that can provide necessary resources and outside perspectives.</p>	<p>Yearlong facilitated activities provide ongoing practice with literacy strategies in a variety of settings and supported by multiple perspectives.</p> <p>A literacy expert, who is a seasoned former teacher and literacy support professional, facilitates online discussions.</p> <p>Practicing teachers, selected because of their knowledge of literacy strategies, serve as online content-area coaches.</p> <p>Content-area colleagues from different schools interact with one another online.</p> <p>Colleagues from different content areas, both on-site and online, offer new perspectives on the application of literacy strategies.</p>

* These principles are supported in the research summaries on the Professional Development spotlight on The Knowledge Loom Web site (<http://knowledgeloom.org>). The principles were articulated by the National Partnership for Excellence and Accountability in Teaching (NPEAT) based on their review of 25 years of professional learning literature and are echoed in the professional development standards published by the National Staff Development Council (2001).

Content, Objectives, and Facilitation

The instructional strategies presented throughout the Collaboratory are described in the Adolescent Literacy Support Framework, which was developed through a LAB research project. Collaboratory participants study the Framework by reading the publication *Adolescent Literacy Resources: Linking Research and Practice* (Meltzer, 2002), as well as related content published on The Knowledge Loom Web site's Adolescent Literacy in the Content Areas spotlight (<http://knowledgeloom.org/adlit>). During initial design of the curriculum, the Collaboratory developers consulted researcher Julie Meltzer and the research project's literacy trainer about the efficacy of face-to-face professional development activities using this content. Subsequently, the trainer served as the pilot Collaboratory's online facilitator, and teachers whom she and Meltzer had trained using the Framework served as online content-area coaches. The developers designed a curriculum to help participants apply the research-based strategies outlined in the Framework to their classroom teaching.

The Collaboratory objectives are for teachers to:

- learn about the four Key Components of the Adolescent Literacy Support Framework—Component A: Student Engagement, Component B: Overarching Research-Based Classroom Practices, Component C: Content-Specific Classroom Practices, and Component D: Organizational Support;
- revise their curriculum and teaching methods to effectively and regularly integrate literacy instruction practices from the first three Key Components;
- reflect thoughtfully on their own teaching to improve implementation of the Framework's practices; and
- reflect thoughtfully on their colleagues' teaching and provide constructive feedback on improving their implementation of the Framework's practices.

Even considering the practical nature of the work, successful completion requires a considerable commitment from participants, translating to roughly three hours of their time each week. Therefore, we arranged for graduate credit as an optional incentive. However, the developers envision the Collaboratory not as a traditional education course, but instead, an opportunity for professional learning focused on a collaborative inquiry process that draws knowledge, experience, and insights from the content, facilitator, online content-area coaches, and participants. It requires adopting what might be considered a new way of thinking about professional learning—an ongoing commitment among a cohort of colleagues to create knowledge together as they experiment with and reflect on new instructional strategies.

Participants and Timeline

The Collaboratory participants form one cohort, consisting of cross-curricular teams from different school sites (referred to as Literacy Teams). Each Literacy Team includes a secondary level (middle or high school) science teacher, math teacher, social studies teacher, and English/language arts teacher from the same school. In some teams, an optional fifth member served as the designated team leader. The Year 1 Collaboratory began with six Literacy Teams, and the Year 2 Collaboratory began with three teams. The cohort sizes ranged from 25 (Year 1) to 14 (Year 2) participants. This range provides a critical mass for discussion while ensuring that the specific professional needs of each participant are met. The Collaboratory spans a full school year with adjustments that take into consideration varying school start dates and specific scheduling needs of each cohort.

■ **Research Study**

The Collaboratory Study as Design Research

This study of the Collaboratory was framed by guidelines for “design research” articulated by Collins, Joseph, and Bielaczyc (2004) and “design studies” by Shavelson, Phillips, Towne, and Feuer (2003).

Collins and his colleagues describe design research as “a way to...test and refine educational designs based on theoretical principles derived from prior research” (p. 8). The principles gleaned from research on online learning and high-quality professional development discussed in the previous section and the practical experience of the developers and their colleagues formed the basis for the initial Collaboratory design. The refinement of the design began as soon as the first Collaboratory was launched. During Year 1, the developers’ informal observations and communications with participants identified a number of problems with participant retention; overall satisfaction with the Collaboratory as a learning experience; and engagement with content, literacy experts, and peers. These problems were later confirmed in an end-of-year report from an external evaluator, Abt Associates (Page, Zuliani, & Gamse, 2004), referred to in this paper as “Abt report.” We sought to address the problems by planning changes to the recruitment and orientation process, the structure and content of face-to-face and online activities, and the support mechanisms provided to participants. These changes were implemented in Year 2.

This study was intended to generate detailed descriptions of the Collaboratory that could help us to verify the accuracy of our preliminary conclusions about Year 1 and to determine whether the changes that we made contributed to better outcomes in Year 2. Shavelson and his colleagues suggest three generic research questions as appropriate to design studies: “What is happening?”, “Is there a systematic effect?”,

and “Why or how is it happening?” (p. 28). Because the Collaboratory project is still at an early stage and we are not yet able to track systematic effects, this study focused on answering the first question and identifying tentative responses to the third. Thus, our primary research question was a descriptive one: “What happened in Year 1 of the Collaboratory and what happened in Year 2 of the Collaboratory with regard to participant retention, overall satisfaction, and engagement?” Following Bruner, we attempt to offer “plausible interpretations” of the differences observed between Year 1 and Year 2 (1990, p. xiii), but we do not make causal claims about the exact reasons for the differences. Our secondary research question reflects this interpretive intent: “How did changes to the recruitment and orientation process, the structure and content of face-to-face and online activities, and the support mechanisms appear to influence participants’ retention, overall satisfaction, and engagement?” Our goal in this study was to provide useful preliminary evidence about whether the adjustments to the design were a move in the right direction.

The structure of this paper reflects our design study approach. Borrowing from Collins et al. (2004), we begin with a discussion of the goals and elements of the Collaboratory design and later describe its implementation in Years 1 and 2, including detailed descriptions of the findings of each year’s implementation in terms of retention, overall satisfaction, and engagement. As Shavelson et al. (2003) suggest, we do not rely solely on a narrative structure typical of design studies; instead, we preface our descriptions of Year 1 and 2 with a discussion of our methods of analysis and data sources. We conclude with a series of hypotheses developed from the analysis and a list of challenges and questions that warrant further investigation.

METHOD

This study identified participant retention, overall satisfaction, and engagement as three issues that were both useful and feasible to assess at this early stage of the project. The high drop-out rate among participants in Year 1 of the Collaboratory (72%) showed that the greatest challenge was **retention**—defined as keeping participants involved in the program. Changes in the recruitment and orientation processes and the support mechanisms addressed this concern.

Our analysis of retention was a three-part process: (1) reviewing assignment completion records to calculate retention percentages for both years; (2) reviewing another set of documents (communications from participants, a Year 1 evaluation report conducted by Abt Associates, and Year 2 team applications and year-end questionnaires) to identify reasons for the disparity in retention between the two years; and (3) determining the relationship between these reasons and the design changes.

The design changes were also intended to improve the **overall satisfaction** of participants from Year 1 to Year 2. For the purposes of this study, we defined overall satisfaction in the following terms: participants' perception of the Collaboratory as a worthwhile, enjoyable pursuit that was helpful in improving their teaching practice and meeting their students' literacy needs. Changes to the orientation process, structure of activities, and support mechanisms addressed some of the sources of dissatisfaction.

To gauge the level of satisfaction with different aspects of the Collaboratory in Year 1 and to identify participants' reasons for satisfaction and dissatisfaction, we first examined the Abt report, anonymous weekly progress logs completed by 10 participants, and notes from the culminating critical friends meeting. Next we examined the data from two Year 2 feedback forms: an evaluation of the five-day orientation and a questionnaire about the full year's experience. After comparing the levels of satisfaction from both years and identifying possible reasons for the disparities that emerged, we determined which differences seemed related to the design changes.

The third issue that the developers considered in this analysis was participant **engagement**. For the purposes of this study, "engagement" should be understood as shorthand for "engagement demonstrated by online postings." Because the majority of Collaboratory activities take place online and the developers were not able to observe most face-to-face Literacy Team activities, we narrowed our focus to this type of engagement. After Year 1, we adapted and added a number of face-to-face and online activities in an effort to improve the level of engagement of participants. To determine the efficacy of these changes, we analyzed engagement on two domains: **participative engagement**, which we defined as the completion and

promptness of postings, and **cognitive engagement**, defined as demonstrated thinking about literacy instruction. To measure cognitive engagement in each posting, the developers designed a coding scheme based on Bloom's Taxonomy of the Cognitive Domain (Bloom, 1956; Huitt, 2004; University of Victoria, 2003). This scheme helped us to assess participants' posted reflections about ideas from three sources: (1) Collaboratory content, (2) the facilitator's or coaches' comments, and (3) peers' comments.

■ Data Sources and Procedure

Retention

To learn more about participant retention in Year 1 and Year 2 of the Collaboratory, the developers reviewed the documents listed in Table 2. The analysis began with one developer reviewing the assignment completion records to graph retention percentages in each year. With help from the other developer, she then reviewed the remaining documents to identify possible reasons for the disparity in retention levels between the two years. She also looked for evidence of the efficacy of specific changes made in Year 2 to improve retention (changes in the recruitment, orientation, and support mechanisms). Finally, she used the conclusions from this document review to determine whether the reasons cited for continuing participation in Year 2 correlated with the design changes.

Satisfaction

To gauge participants' overall satisfaction in Year 1 and Year 2 of the Collaboratory, the developers reviewed the documents listed in Table 3. The main source of data in Year 1 was a series of interviews with participants, as part of an end-of-year evaluation conducted by Abt Associates. In Year 2, in lieu of interviews, participants completed two online questionnaires: one at the end of the first ten-week cycle and another at the end of the school year. In the document review, the developers looked for those sources of satisfaction and dissatisfaction that remained constant from year to year and those that differed. They also sought evidence of the efficacy of specific design changes to improve satisfaction (changes in the orientation process, the support mechanisms, and the structure of activities).

TABLE 2: DATA SOURCES FOR ANALYZING RETENTION

Data Source*	Guiding Questions	Number of Respondents	Method of Analysis
Assignment completion logs created by the online facilitator and automated assignment posting dates from online archives	What were the retention rates in Year 1 and Year 2?	Year 1, n = 28 (25 original participants, and 3 added during Cycle I) Year 2, n = 16 (14 original participants, and 2 added during Cycle II)	One developer reviewed assignment completion records to determine the last date of online activity for each participant. She then calculated and graphed retention percentages for both years.
Personal communication from early exiters and from their team leaders, school change coaches, and school administrators. These include e-mail messages, notes from phone calls, notes from orientations, and anonymous weekly progress logs from Year 1 participants.	What reasons did early exiters and their school administrators provide for their withdrawal?	Year 1, n = 12 (8 of 17 participants and 3 of 4 administrators for teams that exited early; 1 school change coach) Year 2, n = 1 (team leader for two early exiters)	One developer reviewed communications dealing with early exiters. She then listed the reasons cited for their withdrawal and identified common themes.
Abt Associates' evaluation report of Year 1, based on interviews with participants	1) What reasons did early exiters from Year 1 provide for their withdrawal? 2) What reasons did yearlong participants from Year 1 provide for their continuing participation?	n = 9 (4 of 7 participants who completed the Collaboratory; 5 of 17 who exited early)	Developers reviewed the report and extracted participant quotes and evaluator summaries.
End-of-Cycle I ** questionnaires from Year 2	What reasons did participants from Year 2 provide for their continuing participation?	n = 10 (of 12 who completed Cycle I)	One developer reviewed the questionnaires.
End-of-year questionnaires from Year 2	What reasons did yearlong participants from Year 2 provide for their continuing participation?	n = 13 (12 of 14 original participants and 1 of 2 substitutes added in Cycle II)	One developer reviewed the questionnaires, graphed data, and compared data across school teams.

*Data sources are from both Year 1 and Year 2 unless otherwise stated.

** Year 2 was divided into three 10-week cycles.

TABLE 3: DATA SOURCES FOR ANALYZING OVERALL SATISFACTION

Data Source	Guiding Questions	Number of Respondents	Method of Analysis
Abt Associates' evaluation report of Year 1, especially sections summarizing interviews with participants	<p>1) How satisfied were Year 1 participants with different aspects of the Collaboratory?</p> <p>2) What reasons did Year 1 participants provide for their satisfaction and dissatisfaction?</p>	n = 9 (4 of 7 participants who completed the Collaboratory; 5 of 17 who exited early)	One developer reviewed the report and extracted participant quotes and evaluator summaries.
Participants' anonymous weekly progress logs from Year 1, reporting time spent on tasks and frustrations or concerns	What were common sources of frustration or concern for Year 1 participants?	n = 10 (of 25 original participants)	One developer reviewed the logs, flagged information relevant to the question, and listed common themes.
Notes from critical friends meeting at end of Year 1	<p>1) How satisfied were Year 1 participants with different aspects of the Collaboratory?</p> <p>2) What reasons did Year 1 participants provide for their satisfaction and dissatisfaction?</p>	n = 6 (of the 7 yearlong participants who attended the meeting)	One developer reviewed notes and listed relevant information. Second developer reviewed the list.
Orientation evaluation forms from Year 2	<p>1) How satisfied were Year 2 participants with the orientation?</p> <p>2) What reasons did Year 2 participants provide for their satisfaction and dissatisfaction?</p>	n = 15 (14 participants and 1 administrator)	One developer reviewed the forms, including satisfaction ratings, and identified common themes.
End-of-year questionnaires from Year 2	<p>1) How satisfied were Year 2 participants with different aspects of the Collaboratory?</p> <p>2) What reasons did Year 2 participants provide for their satisfaction and dissatisfaction?</p>	n = 13 (12 of 14 original participants and 1 of 2 substitutes added in Cycle II)	One developer reviewed the questionnaires, graphed relevant data, and compared data across school teams.

Engagement

To gauge participant engagement in Year 1 and Year 2 of the Collaboratory, the developers coded parallel assignments from each year that called for some level of engagement with one of the following three critical elements: (1) Collaboratory content, (2) the facilitator and content-area coaches, and (3) online and school peers. The developers analyzed the assignments and postings listed in Table 4.

One developer coded the postings first for their promptness and completion—participative engagement. Then both developers coded the postings of science and social studies teachers (roughly half of the cohort in each year) for their level of cognitive engagement. This measure was intended to capture how participants demonstrated their understanding and application of the literacy ideas that they encountered in the readings and in others' postings.

Our two-tiered approach to coding was adapted from France Henri's recommendations on analyzing content in computer conferencing (1991, p. 125). Henri suggests gauging participation in part by counting the number of messages or statements posted by each member of the group. However, because of the limited time frame and preliminary nature of our study, we did not count all of the messages or parse all of the statements posted in each year of the Collaboratory. Instead, for each assignment, we recorded the number of participants who posted responses and whether those responses were on time, one to three days late, or four or more days late.

We judged prompt completion of assignments as an indicator of active participation because it was so critical for the effective exchange of ideas that is the basis for Collaboratory learning, a point that was stressed to participants at the beginning of the year. Each assignment was designed as an opportunity to start or continue a professional conversation; therefore, when people joined the conversation after the topic had shifted, they detracted from an important collaborative knowledge-building activity. As Hiebert and his colleagues explain, collaborations are "essential for the development of professional knowledge...because [they] force their participants to make their knowledge public and understood by colleagues" (2002, p. 7).

Because of time constraints, coding all participants' responses for cognitive engagement was not possible. We coded only the postings of the social studies and science teachers. These groups were selected for two reasons. First, the math cohort in Year 1 was reduced to only one teacher after the first few weeks of the program, and groups of at least two members provided a greater variety of postings for analysis. Second, because the goal of the Collaboratory is to engage teachers from four different content areas in using literacy instruction strategies, it was useful to examine groups of teachers in content areas not traditionally associated with literacy, such as English/language arts.

TABLE 4: DATA SOURCES FOR ANALYZING ENGAGEMENT

Data Source	Guiding Questions	Number of Postings	Method of Analysis
Year 1, Lesson Idea assignment and postings	1) How many participants completed their postings, and how promptly? 2) What level of thinking about literacy instruction ideas from content was demonstrated in postings?	n = 8 coded for participative engagement n = 5 coded for cognitive engagement	One developer coded all postings for participative engagement. Two developers separately coded postings from social studies and science teachers for cognitive engagement with content.
Year 2, Problem Scenario and Anticipation Guide assignment and postings (adaptation of Year 1 Lesson Idea assignment)	1) How many participants completed their postings, and how promptly? 2) What level of thinking about literacy instruction ideas from content was demonstrated in postings?	n = 12 coded for participative engagement n = 6 coded for cognitive engagement	One developer coded all postings for participative engagement. Two developers separately coded postings from social studies and science teachers for cognitive engagement with content.
Year 1, Strategy Report assignment and postings	1) How many participants completed their postings, and how promptly? 2) What level of thinking about literacy instruction ideas from facilitator and/or coach was demonstrated in postings?	n = 7 coded for participative engagement n = 3 coded for cognitive engagement	One developer coded all postings for participative engagement. Two developers separately coded postings from social studies and science teachers for cognitive engagement with facilitator and/or coach feedback.
Year 2, Strategy Reply and Strategy Report assignments and postings	1) How many participants completed their postings, and how promptly? 2) What level of thinking about literacy instruction ideas from facilitator and/or coach was demonstrated in postings?	n = 12 coded for participative engagement n = 6 coded for cognitive engagement	One developer coded all postings for participative engagement. Two developers separately coded postings from social studies and science teachers for cognitive engagement with facilitator and/or coach feedback.
Year 1, Lesson Reflection assignment and postings	1) How many participants completed their postings, and how promptly? 2) What level of thinking about literacy instruction ideas from peers was demonstrated in postings?	n = 7 coded for participative engagement n = 4 coded for cognitive engagement	One developer coded all postings for participative engagement. Two developers separately coded postings from social studies and science teachers for cognitive engagement with peer feedback.
Year 2, Lesson Reflection assignment and postings	1) How many participants completed their postings, and how promptly? 2) What level of thinking about literacy instruction ideas from peers was demonstrated in postings?	n = 10 coded for participative engagement n = 6 coded for cognitive engagement	One developer coded all postings for participative engagement. Two developers separately coded postings from social studies and science teachers for cognitive engagement with peer feedback.

Our coding scheme for cognitive engagement (see Table 5) was based on Benjamin Bloom’s Taxonomy of the Cognitive Domain: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956; Huitt, 2004; University of Victoria, 2003). At least two other recent studies of computer-mediated communication have also used this taxonomy as the basis for their coding schemes (Warren & Rada, 1999; Gilbert & Dabbagh, 2005). We chose Bloom’s taxonomy because it offered a straightforward measure of the different ways in which Collaboratory participants made meaning from and made use of the content and the comments from the facilitator, coaches, and peers. We also recognized that, given its ubiquity in educational circles, Bloom’s taxonomy had already influenced our development of the Collaboratory activities: We called on participants to demonstrate their *comprehension* of ideas from the reading; to *apply* these ideas in their own classrooms; to *analyze* different researchers’ perspectives on a literacy issue; to *synthesize* ideas from their reading and from peers, facilitator, coaches as they created lessons; and to *evaluate* their own and their colleagues’ lessons. Because our main goal in conducting this study was to gather information to support further refinement of the Collaboratory, it was important to determine whether the types of cognitive engagement that our assignments were designed to stimulate were actually taking place.

TABLE 5: CODING SCHEME FOR COGNITIVE ENGAGEMENT*

Code Name & Level	Description	Characteristic Activities
5 – Synthesis/Evaluation	EITHER integrates and combines ideas to create a new product or plan (such as a lesson plan) OR compares and/or judges ideas based on logical argument using specific criteria	Create, design, invent, combine; OR assess, decide, critique
4 – Analysis	Identifies patterns, distinctions, and/or relationships among ideas, assumptions, and questions	Separate, order, explain, connect, classify, infer
3 – Application	Selects and uses information or ideas to solve a problem or complete a task	Apply, demonstrate, illustrate, experiment, modify
2 – Comprehension	Demonstrates understanding of ideas. Understanding may include interpretation of facts, basic comparison and grouping, and/or translation of knowledge into new contexts.	Summarize, interpret, describe, contrast, predict, discuss, extend
1 – Knowledge	Identifies or recalls major ideas in the form in which they were presented. Knowledge is at level of basic identification of ideas, not deep understanding.	List, define, tell, identify, name
0 – No Engagement	Makes no reference to ideas, although responding to these ideas was an expectation of the assignment	

*Adapted from Bloom (1956), Huitt (2004), and University of Victoria (2003).

Like Warren and Rada (1999), who used Bloom’s taxonomy to code peer interaction in a computer-mediated university course, we found that applying the codes without detailed knowledge of the assignment, previous postings, or content to which the postings referred was impossible. There was not sufficient time or resources to both familiarize other staff members with the context for the postings and also train them to complete the coding. Therefore, the two developers and the Collaboratory liaison served as the coders. One developer designed two initial drafts of the coding scheme and revised them based on feedback from Alliance Research and Evaluation staff. The third draft was continually updated as the two developers completed the coding. Although no formal training was conducted, the two developers and the liaison referred to the same code definitions and, when possible, identified benchmark postings—sample postings coded in the same way—to guide their work.

The procedure for coding postings for engagement was as follows. First one developer used the assignment completion records and archived posting dates to graph completion and lateness numbers (participative engagement) for each selected assignment. Then both developers reviewed the wording of the assignments and reached an agreement about both the levels of cognitive engagement that each assignment required according to Bloom’s taxonomy and the expected objects of engagement. (Some assignments call for only one level of cognitive engagement with one object, and other assignments call for different levels of cognitive engagement with multiple objects.) Objects of engagement included feedback from peers; feedback from the facilitator and coaches; and four different content sources: the Adolescent Literacy spotlight on The Knowledge Loom Web site, the *Adolescent Literacy Resources* publication, a problem scenario in Year 2, and participants’ lessons. (These content sources are described in greater detail in the next section.) Thus, an assignment requiring participants to apply a teaching strategy that they read about on The Knowledge Loom would be coded as “Loom 3 – Application,” referring to the code name and level “3 – Application,” listed in Table 5. (See Appendix A for examples of how postings were coded for one assignment in Year 1 and Year 2.)

For each assignment, the two developers independently coded the relevant postings from participating social studies and science teachers, assigning codes based on the highest level of cognitive engagement evident in a posting. At this stage in the coding process, the developers were in agreement 75% of the time. Then the liaison analyzed the postings that they had coded differently. The liaison’s codes matched one of the two developer’s codes for these postings 80% of the time. Next, the developers discussed the postings that still had discrepant coding, and guided by benchmark postings, they came to a resolution. Many discrepancies in coding were due to unclear attribution of ideas in the postings, such as lesson reflections that did not identify whether a suggestion about how to improve a lesson came from the observer or the teacher posting the reflection.

■ DESCRIPTION OF YEAR 1

In this section, we describe Year 1 implementation details regarding recruitment, orientation, structure of activities, and support mechanisms, followed by a discussion of findings drawn from the data sources.

■ Year 1 Implementation

Recruitment

To recruit participants for the pilot Collaboratory, the developers relied on established relationships. We approached schools and districts with pre-existing technical assistance contracts with The Education Alliance's Secondary School Redesign program area, reasoning that their participation reflected a commitment to school improvement. We also assumed that they would have cross-content teams in place because teaming is one aspect of the schools' work with Secondary School Redesign. The developers presented administrators at these sites with an overview of the Collaboratory purpose and logistics, along with a list of requirements for successful participation called *Keys to Success*. We accepted schools on a first-come, first-served basis. At all the sites, administrators made the initial decision to participate and then approached selected teachers, asking them to serve as members of the school's Literacy Team. Participants had the option to earn three graduate credits, with tuition paid either by the schools or by the individuals themselves.

The resulting cohort consisted of 25 participants organized into six Literacy Teams representing three rural schools (in Maine, Massachusetts, and New Hampshire) and three urban schools (one in Massachusetts and two in New York). Levels of teaching experience ranged from one year to over 20 years. In none of the cases was the anticipated cross-discipline team already in place prior to the Collaboratory.

Orientation Process

Between August and early September 2003, the developers traveled to the six school sites for orientation meetings. Both developers conducted the meeting together at the first site to ensure continuity of their initial message to participants. Only one developer visited each of the remaining sites. Sessions lasted three hours, taking place either after school or during paid professional development time. In addition to Collaboratory participants, we requested that an administrator or team support person (school literacy coach, curriculum or technology coordinator, or administrator) attend the meeting to become familiar with the expectations of the Collaboratory and demonstrate support for the efforts of the participating Literacy Team. Four of the six sites met this request. During the orientation session, participants completed a pre-participation questionnaire, learned about the

Collaboratory purpose and objectives, practiced using The Knowledge Loom and the online interactive environment (Sitescape), and posted personal biographies.

Structure and Content of Online and Face-to-Face Activities

Activities conducted between September 2003 and May 2004 were organized into two segments—Part I: Literacy Seminar and Part II: Curriculum Lab.

Part I: Literacy Seminar consisted of 12 weeks of facilitated online discussions and several on-site activities. The first two weeks focused on having participants report on past experiences using literacy strategies, identify challenges within and across teams, and articulate a team literacy vision. The next six weeks focused on exploring information about the first three components of the Adolescent Literacy Support Framework and then experimenting with self-selected strategies. Participants spent approximately two weeks on each component of the Framework. The exploration and experimentation activities were driven by active and ongoing feedback from the facilitator and, to a lesser degree, feedback from the content-area coaches. Peer interaction was encouraged online and through three required on-site Literacy Team meetings.

Part II: Curriculum Lab consisted of four four-week cycles (January to May, 2004) during which each participant created, tested, and refined a content-area lesson incorporating the literacy instruction strategies studied during the Literacy Seminar. Lesson development was supported by the content-area coaches; the online input from colleagues in combined content groups (math/science and social studies/English/language arts); and, to a lesser degree, the facilitator.

Each four-week cycle followed a pattern of (1) reviewing one component of the Framework by completing assigned readings in the *Adolescent Literacy Resources* publication, (2) posting lesson ideas and offering feedback to others, and (3) designing and teaching content-specific lessons that integrated literacy strategies. In the fourth cycle, participants incorporated strategies from any or all of the Framework components into their content-area lessons. On-site Literacy Team members were required to observe, videotape, and give feedback on one peer lesson each cycle. The expectation was that each participant would have a video record of his or her four demonstration lessons by the end of the Curriculum Lab. In cases where scheduling made live observation impossible, the observer could view the video of the lesson and then give feedback. At the end of each cycle, a team meeting provided an opportunity to share lessons and discuss application of the strategies across content areas. Participants were expected to post lesson plans, lesson reflections, and a summary of observer input. General guidelines for lesson plans and a lesson observation template were provided.

At the end of the Curriculum Lab, participants selected segments from one of their videotaped lessons to bring to a one-day culminating critical friends meeting hosted

at a participating school site. The meeting provided an opportunity for online colleagues to work with their content-area coaches in discipline-specific groups. They shared their experiences with using the literacy practices and discussed how to sustain regular integration of these instructional practices into their content-area lessons. Video segments served as a springboard for discussions about analyzing and improving practice. The critical friends meeting also devoted time to debriefing about the overall Collaboratory experience.

Support Mechanisms

Sitescape was used as the online discussion environment. It provided a simple folder system for organizing threaded discussions. Developers initiated ongoing local support by an administrator and/or technical person at each site through (1) providing administrators with the *Keys to Success* requirements for participation and (2) preliminary conversations with administrators about their commitment and involvement. The facilitator tracked late assignments, and developers stayed in touch with an administrator at each site by phone and e-mail. The developers provided the participants with an online question-and-answer forum where they could post technical problems and get a response from one of the developers in 24 hours or less. At one site, an independent contractor serving as a school change coach made periodic visits to the school and met with the Literacy Team on a regular basis to monitor their progress and provide ongoing support. He stayed in close contact with the developers and served as a liaison with the principal.

■ Year 1 Findings

The pilot year of the Collaboratory was a learning experience, as much for the developers as for the participants. Retention was the main challenge. Of the 25 teachers who participated in an orientation, only 7 completed the project. Of those who remained throughout the year, many found it a valuable professional development experience that exposed them to useful strategies for improving their students' literacy skills (Abt report, p. 9); however, the shrinking size of the Year 1 cohort and frustrations with technology took a toll on the overall satisfaction of those who remained (critical friends meeting, 6/8/04; Abt report, pp. 5–9). Participants did engage with Collaboratory content, the facilitator and coaches, and peers, but the majority of postings exhibited a low level of both participative and cognitive engagement.

Retention

The retention numbers in Year 1 showed a steady decline in the first 12 weeks of Part I: Literacy Seminar. Of the six original four- and five-person teams, one team participated only in the orientation; although one teacher on this team posted her Week 1 assignments, the rest completed no Part I assignments and officially dropped out in Week 2. Of the remaining five teams, only two posted all of their Week 1

assignments. In the other three teams, individual members had already started to drop out or participate selectively, completing only a portion of the assignments. By Week 4, one team had exited, another team had lost all but one member, and a third team was involved but regularly failed to complete assignments. By the time the Part II: Curriculum Lab began in Week 13, two three-person teams and one science teacher from a third team remained. Another science teacher from one of the original teams posted occasionally but completed only a small percentage of assignments. After Week 13, retention stabilized at seven participants.

Recruitment strategy. A review of notes from the orientation sessions, phone conversations with early exiters, and interviews conducted by the evaluator, Abt Associates, suggested that the most significant factor in Year 1 retention problems was a flawed recruitment process. Very few of the teachers recruited to participate by their administrators had a clear understanding of what their involvement would entail. Some were surprised to learn that the Collaboratory was a yearlong commitment (Abt report, p. 5); in fact, one team was told by their administrator that the commitment was three hours total, not three hours per week (personal communication from team members during orientation, 9/26/03). Other teachers had no time to form opinions about the Collaboratory because they were chosen to participate on the day of the orientation (personal communication from team members during orientation, 8/19/03). Once prospective participants learned what the project entailed, many identified reasons for not being able to participate (Abt report, p. 5; e-mail from school change coach, 9/4/03). Common reasons cited were lack of sufficient time and concern about other pressing responsibilities (Abt report, p. 5; phone conversation with team members and principal, 10/8/03).

School teams. Another factor contributing to the high attrition rate was the lack of pre-existing, cohesive, interdisciplinary school teams. The developers sought to recruit pre-existing teams in order to help support the collaborative learning process; therefore, we marketed the pilot to schools that had adopted reforms promoting teacher teaming. However, none of the Literacy Teams that ultimately signed up had worked as a team before. Uncomfortable interpersonal dynamics contributed to the attrition of at least one team (weekly logs).

Administrative support. Weak administrative support also affected the withdrawal of teams. One team withdrew mainly because the principal had also assigned each member to pressing curriculum development tasks that were a higher priority (phone conversation with team members and principal, 10/8/03). Ultimately, very few of the administrators supported their Collaboratory teams in the concrete ways suggested in *Keys to Success* (e.g., reducing non-teaching responsibilities, providing paid team meeting time, making video recording equipment accessible) (critical friends meeting, 6/8/04). As one participant explained, “We were promised, but never given, administrative support so that we could participate and work together. We were denied release from duty periods. Staying after school [unpaid] was the only possibility” (Abt report, p. 10).

Graduate credit. One clear factor that supported retention was receiving graduate credit. Of the seven participants who completed the Collaboratory, all had registered and paid to take the course for graduate credit. For four of the participants, this credit helped either to satisfy a continuing education requirement or to boost their position on the district pay scale. For another three, their work in the Collaboratory helped to satisfy their master's degree requirements. None of those who exited early had registered for graduate credit. However, one early exiter left to enroll in a degree-granting literacy program (e-mail from school administrator, 12/7/03).

Overall Satisfaction

The low retention rate (28%) took its toll on the satisfaction of those who stayed for the entire year. One participant reported being frustrated by not having enough science colleagues to talk to online (critical friends meeting, 6/8/04), while another said she felt “very much alone” when her school teammates dropped out (Abt report, p. 7). Others said they would have enjoyed the year more had there been more participants (Abt report, p. 9). However, most participants who remained involved for the whole year found it a positive experience and a good introduction to strategies for improving adolescent literacy (Abt report, p. 9). Participants were most enthusiastic about the usefulness of the Knowledge Loom content (Abt report, p. 6) and the rewards of exchanging literacy instruction strategies with other teachers (Abt report, p. 9).

Technology-related problems. Technical frustrations were a common complaint. A few participants did not have easy access to the Internet or had a slow connection. However, even for participants with reliable Internet access, the SITESCAPE online environment itself caused problems, generating data errors more frequently as the year progressed. The organization of assignments and posting areas in the online environment, limited by SITESCAPE's features, also caused confusion and frustration. One teacher explained that “it was difficult to get used to and difficult to figure out where to put your responses” (Abt report, p. 5). Another teacher wrote, “This process of getting on for the first time has been extremely difficult and frustrating (for a person with a degree in CS—even!)” (weekly logs).

Videotaping the lessons was another major source of concern. Both teams that completed the Curriculum Lab segment of the Collaboratory reported difficulties getting the necessary equipment from their schools (critical friends meeting, 6/8/04; Abt report, p.7). Although administrators had assured the teams that access to video equipment would not be a problem, the teachers often found that it was missing or broken when they needed it, and they had some difficulty planning when they would be ready to tape their lessons (critical friends meeting, 6/8/04).

Time commitment. Among early exiters, the most common reason cited for dropping out of the Collaboratory was the lack of sufficient time. On the average, participants reported spending one to three hours per week—although technical

and interpersonal problems sometimes led to as many as six or eight hours in one week (Abt report, pp. 5–6; weekly logs). Interview data suggest that concerns about the time commitment were not as prominent among the yearlong participants, who had all registered to receive graduate credit for their participation. As one yearlong participant commented, “It was very time consuming, but no more than any other graduate class” (Abt report, p. 9).

Content. Most found the Knowledge Loom’s Adolescent Literacy spotlight useful for its practical strategies and links. One teacher described the spotlight as “fabulous. It broke everything down into the four components and gave teaching examples very clearly” (Abt report, p. 6). Participant feedback on the *Adolescent Literacy Resources* publication was less enthusiastic, but for conflicting reasons. One teacher described it as “too researchy” and would have preferred articles that gave more “hands-on” advice about practice (critical friends meeting, 6/8/04). Another resented being asked to read research summaries rather than complete articles, saying, “I know how to read and analyze articles. Just give us the research” (Abt report, p. 6). Math and science teachers said the experience would have been more useful if both The Knowledge Loom and *Adolescent Literacy Resources* had provided more material related to their specific concerns (Abt report, p. 6).

Facilitator and coaches. Participants’ satisfaction with the facilitator varied. Some found her “very enthusiastic and helpful,” and others reported that she was “aggravating” and too critical (Abt report, p. 7). A number of participants spoke positively about their online interactions with coaches. One described her coach as “super...she talked both as a coach and as a fellow teacher and not in a pushy way” (Abt report, p. 7). Others reported having little contact with their coaches. In fact, the original math coach had to leave the Collaboratory in the beginning of Part II, leaving one participant to complain, “My online coach was virtually non-existent” (Abt report, p. 7). (The science coach, who had also taught math, supported the remaining math teacher during Part II.)

One reason that coaches gave for their limited contact with some participants was the lateness of participant postings (Abt report, p. 7). Because so many participants missed deadlines and failed to post assignments, coaches were not able to provide timely responses. Furthermore, some coaches were discouraged by the lack of responses from those they addressed and doubted whether teachers were even reading their comments (Abt report, p. 7).

Overall rating. Teachers viewed the Collaboratory as a good introduction to a collection of literacy resources and a good opportunity to learn new classroom strategies (Abt report, p. 9). They were most enthusiastic about the chance to collaborate with peers, both within their school groups and online with teachers from their content area (Abt report, p. 9; critical friends meeting, 6/8/04).

Engagement With Content

To measure participants' engagement with content, we analyzed postings from the Lesson Idea assignment at the beginning of the Curriculum Lab, Week 13. By this time, only two three-person teams and two science teachers remained. This assignment was intended as a review of the Knowledge Loom material on student motivation, an opportunity to explore its research basis in *Adolescent Literacy Resources*, and a first step in the process of developing a complete lesson plan that focused on motivation. Participants were asked to read relevant sections of the text and Web site and post a lesson idea drawing on a strategy mentioned in either reading.

Participative engagement for the Lesson Idea assignment was fairly low. Of the remaining eight participants, four posted their assignments late—two over a week late. Among the social studies and science teachers' postings, there was very little reference to *Adolescent Literacy Resources*—no reference significant enough to merit coding—and later conversations with the participants revealed that few had read this text closely, if at all (critical friends meeting, 6/8/04). Participants were somewhat more successful at engaging with the Knowledge Loom content.

As shown in Table 6, one participant's posting demonstrated the requested level of cognitive engagement—the application of a Loom idea to her practice (“Loom 3 – Application”). Three others showed only that participants had read some of the strategies on the Loom (“Loom 1 – Knowledge”), and one failed to show even this.

TABLE 6: COGNITIVE ENGAGEMENT WITH LOOM CONTENT FOR LESSON IDEA ASSIGNMENT

Name of Code*	Number of Postings
Loom 5 – Synthesis/Evaluation	-
Loom 4 – Analysis	-
Loom 3 – Application	1
Loom 2 – Comprehension	-
Loom 1 – Knowledge	3
Loom 0 – No Engagement	1

*Code in boldface is the targeted level of cognitive engagement for the assignment.

Engagement With Facilitator and Coaches

In Part I of the Collaboratory, after selecting a literacy strategy from The Knowledge Loom and posting their ideas about how they might implement this strategy in their classroom, participants received feedback from the facilitator and coaches about their ideas. In Week 4, they were asked to implement the strategies in their classes

and post a Strategy Report on the implementation. This assignment provided an opportunity for developers to gauge whether participants processed the feedback that they had received.

By Week 4, 13 participants had dropped out, and participative engagement continued to decline. Of the remaining 12 participants, 5 never posted a Strategy Report and 2 posted late (by one and three days). Among the three science and social studies teachers who posted, only two acknowledged facilitator or coach input in their responses, but at a very low level of cognitive engagement (e.g., “Thanks for the tip.”), as shown in Table 7.

TABLE 7: COGNITIVE ENGAGEMENT WITH FACILITATOR/COACH FEEDBACK FOR STRATEGY REPORT ASSIGNMENT

Name of Code*	Number of Postings
Facilitator/Coach 5 – Synthesis/Evaluation	-
Facilitator/Coach 4 – Analysis	-
Facilitator/Coach 3 – Application	-
Facilitator/Coach 2 – Comprehension	-
Facilitator/Coach 1 – Knowledge	2
Facilitator/Coach 0 – No Engagement	1

*Code in boldface is the targeted level of cognitive engagement for the assignment.

Engagement With Peers

We examined engagement with peer input in Year 1 by looking at the postings from the final week of the first lesson cycle, Week 15. This Lesson Reflection assignment was a follow-up to a lesson observation. After being observed by a school team colleague, each participant met with the observer, discussed the lesson and the evaluation rubric that the observer had completed, and then posted a reflection about the lesson, including a short response to three questions:

- 1) What did you feel were the most effective aspects of the literacy strategies incorporated into the lesson? Why?
- 2) What comments did your teammate share related to each section of the rubric after observing the lesson?
- 3) What would you change about the lesson if you were to use it again?

By Week 15, only the final seven Collaboratory participants remained, but participative engagement improved, as all seven posted the assignment. However, only two posted on time, and one of these postings was incomplete, because the teacher had not yet met with her observer. The other five reflections were posted one to four days late.

Among the four social studies and science teachers, two restated some basic ideas from their observers (“Peer 1 – Knowledge”), but only one actually built on the input that he received to develop and discuss new strategies for the lesson (“Peer 3 – Application”), as shown in Table 8. (The coders checked each lesson reflection against the observers’ evaluation forms to ensure that limited discussion of peer input was not simply a result of limited or unclear peer input.)

TABLE 8: COGNITIVE ENGAGEMENT WITH PEER FEEDBACK FOR LESSON REFLECTION ASSIGNMENT

Name of Code*	Number of Postings
Peer 5 – Synthesis/Evaluation	-
Peer 4 – Analysis	-
Peer 3 – Application	1
Peer 2 – Comprehension	-
Peer 1 – Knowledge	2
Peer 0 – No Engagement	1

*Code in boldface is the targeted level of cognitive engagement for the assignment.

As shown in Table 9, two of the four lesson reflections were at the comprehension level (“Lesson 2 – Comprehension”), and one was at the knowledge level (“Lesson 1 – Knowledge”). In these postings, teachers listed or described a few of the literacy activities from their lesson but either did not analyze their effectiveness or provided a limited explanation. Only the teacher who built on the peer input offered a true analysis of the reasons for the success of his lesson and a thorough explanation of the reasons for his proposed changes (“Lesson 5 – Synthesis/Evaluation”).

TABLE 9: COGNITIVE ENGAGEMENT WITH LESSON IMPLEMENTATION FOR LESSON REFLECTION ASSIGNMENT

Name of Code*	Number of Postings
Lesson 5 – Synthesis/Evaluation	1
Lesson 4 – Analysis	-
Lesson 3 – Application	-
Lesson 2 – Comprehension	2
Lesson 1 – Knowledge	1
Lesson 0 – No Engagement	-

*Code in boldface is the targeted level of cognitive engagement for the assignment.

■ DESCRIPTION OF YEAR 2

In this section, we describe Year 2 implementation details regarding recruitment, orientation, structure of activities, and support mechanisms, followed by a discussion of findings drawn from the data sources.

■ Year 2 Implementation

Recruitment

In Year 2, participants were recruited through broader dissemination. The developers created a Web page and informational brochure accessed from The Knowledge Loom Web site and announced registration deadlines to all registered Knowledge Loom users through an electronic newsletter, *On the Loom*. The general public learned about the Collaboratory through meetings sponsored by the Alliance, presentations at conferences, and listserv and e-mail announcements.

All potential participants received an electronic version of *Keys to Success*, the same list provided in Year 1. Interested school administrators were required to identify a pre-existing school team, provide the individual e-mail addresses of each team member, and draft a brief statement about the school's literacy goals on an online registration form. Subsequently, team members received an automated e-mail message requiring them to complete an individual application and state their participation goals.

These activities demonstrated to the developers that administrators and the selected Literacy Team members had a basic awareness of the goals and objectives of the Collaboratory and how these might align with the school's literacy goals. It also demonstrated the ability of the team members to interact with technology and complete a task cooperatively. Additionally, the registration form required the team to designate a leader to serve as primary contact to Alliance staff. The team leader could be one of the four required team members, a fifth team member participating in all activities, or a school administrator who remained in close contact with the Literacy Team members and Alliance staff.

Three school teams applied to participate in the Collaboratory, and all were accepted. The resulting cohort consisted of 14 participants organized into three Literacy Teams representing two rural locations (one in Missouri and the other in the U.S. Virgin Islands) and one urban location (in Rhode Island). The leaders of the Virgin Islands and Rhode Island teams were practicing classroom teachers who participated fully throughout the year. The school principal led the Missouri team. Classroom teaching experience varied across sites from a first-year teacher to veterans, some with more than 20 years of teaching experience. The registration

process ensured that a cross-discipline team was already in place prior to the beginning of the Collaboratory.

Orientation Process

The Alliance hosted a five-day Orientation Institute at Brown University from August 16 to 20, instead of the multiple orientation visits in Year 1. All participants and team leaders attended the Institute.

Orientation activities modeled aspects of the online and team activities that participants would experience throughout the year. Participants learned about the Collaboratory objectives and practiced using The Knowledge Loom and the new online environment (Moodle). They completed a pre-participation questionnaire and posted personal biographies, receiving electronic feedback from their coaches and one another. Working in their school-based cross-content teams, participants set a team literacy vision, reported on past experiences using literacy strategies, and discussed challenges. Developers modeled the use of the lesson templates and observation guides. Organized into content-area teams, participants experienced the process of planning, teaching, and critiquing a content-area lesson infused with literacy strategies. Conversations provided the raw material for development of problem scenarios, which were used during the online discussions. All activities emphasized the Collaboratory experience as an ongoing professional conversation in which a community of learners actively engages around a topic of mutual importance.

Structure and Content of Online and Face-to-Face Activities

The Year 1 Literacy Seminar (12 weeks) and Curriculum Lab (18 weeks) segments were blended in Year 2 into three 10-week activity cycles that took place between September 2004 and May 2005. This new format, which had been suggested by Year 1 participants (Abt report, p. 12), allowed teachers to be involved in hands-on lesson planning opportunities throughout the year. It also allowed for more flexibility in defining contact hours for Collaboratory participation. The developers were able to offer an optional six graduate credits—36 hours from August to December and 36 hours from January to May. Contact hours were defined as online interactions and on-site meetings with colleagues.

Each 10-week cycle focused on one of the first three components of the Adolescent Literacy Support Framework. The 10-week cycles followed a pattern of (1) using an anticipation guide and problem scenario to activate prior literacy knowledge and set a purpose for completing selected readings in *Adolescent Literacy Resources*; (2) exploring The Knowledge Loom to find literacy strategies that address the problem scenario; (3) experimenting with literacy strategies in preparation for lesson planning; (4) posting a lesson idea that incorporates one or more literacy strategies and receiving peer, coach, and facilitator feedback; (5) responding to one another's

lesson plan ideas; (6) designing and teaching a content-specific lesson; and (7) having lessons observed, videotaped, and critiqued by team members, coaches, the facilitator, and developers.

The exploration, experimentation, lesson planning, and lesson reflection activities included active and ongoing feedback from both the facilitator and the content-area coaches. Assignments specifically described the number and type of online peer interactions that were required, both within and across discipline groups. To build local capacity, a two-hour Literacy Team meeting at the end of each cycle was required. At these meetings, teams shared video clips from their lessons for additional peer feedback and discussed how the literacy strategies that they used could be applied to other content areas. Often, teams chose to meet more frequently to help one another complete assignments, to discuss literacy challenges, and to set team goals.

At the end of Cycle III, participants selected segments from one of their videotaped lessons to bring to a one-day culminating critical friends meeting. The event was hosted at Brown in tandem with the Orientation Institute for a new Adolescent Literacy Collaboratory, providing an opportunity for teachers to broaden collegial connections by sharing their insights and experiences with another cohort. Discussions emphasized exploring ways to sustain integration of literacy instruction practices into content-area lessons and identifying strategies for sharing literacy resources and experiences with other colleagues at their sites.

Support Mechanisms

Moodle replaced Sitescape as the online environment because of technical problems experienced with Sitescape. Moodle provided threaded discussion tools, more flexible options for organizing resources and activities, and a more intuitive user interface. In addition, developers added a liaison to the support team. The liaison handled participant concerns and technical problems throughout the year.

Each Literacy Team designated a team leader to serve as the point person for communication with the developers, liaison, facilitator, and the team. Team leaders were required to attend the on-site team meetings and participate in periodic telephone conferences with the developers, facilitator, and other team leaders to report on the on-site meetings and address any issues that arose.

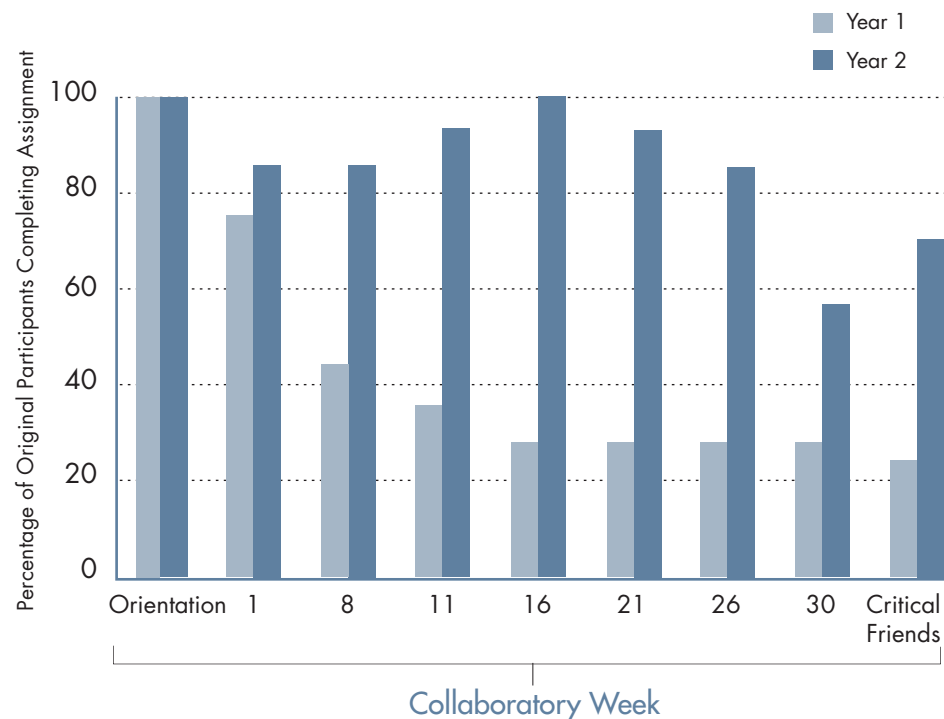
The facilitator tracked late assignments and played an active role in grading for graduate credit. The liaison contacted the team leaders by phone and e-mail to follow up on missing postings by team members. Additionally, the liaison oversaw an online question-and-answer forum. Periodic phone conferences among developers, the facilitator, coaches, and the liaison provided opportunities to address participation issues as a team, as well as to discuss curriculum and schedule adjustments.

Year 2 Findings

In the second year of the Collaboratory, retention, overall satisfaction, and engagement all improved. In contrast to the 28% retention rate in Year 1, almost all of the participants in Year 2 stayed for the full year, and the two early exiters were replaced. Participants also demonstrated significantly higher overall satisfaction with the Collaboratory experience (orientation evaluations; end-of-year questionnaires; e-mails, 2/21/05 and 4/12/05). Furthermore, analysis of selected postings revealed a higher level of participative and cognitive engagement with content, the facilitator and coaches, and peers.

Retention

FIGURE 1: RETENTION OF PARTICIPANTS IN YEARS 1 AND 2



As Figure 1 suggests, all three school teams remained actively involved throughout the year. However, one team did have some early retention problems, losing two members between the Orientation Institute in August and the first week of Cycle I in September. One teacher dropped out due to time constraints; she was completing an online master's degree in addition to teaching full time (team leader conference call, 10/27/04). The other teacher had to deal with a family crisis that resulted in her leaving teaching altogether for the year (personal conversation with team leader, 1/12/05). The team leader found replacements for both teachers.

The new teachers joined the Collaboratory during Cycle II, and both participated somewhat erratically. They observed and critiqued their teammates' lessons, but they often failed to post their own assignments (assignment completion logs). In the last two cycles, at least one member of each team failed to complete his or her final postings, in which participants were asked to report on their team's debriefing of the lesson videos and respond to final coach feedback on these lessons. This resulted in the 57% completion rate for the final assignment. However, all but one participant posted a final lesson, and 10 of the 14 participants attended the critical friends meeting, indicating that they considered themselves active members of the cohort.

Our findings reveal some improvements in addressing the three key causes for retention problems in Year 1, which were (1) a weak recruitment strategy that limited the number of potential participants and led to confusion about expectations; (2) a lack of pre-existing, cohesive teams; and (3) weak administrative support.

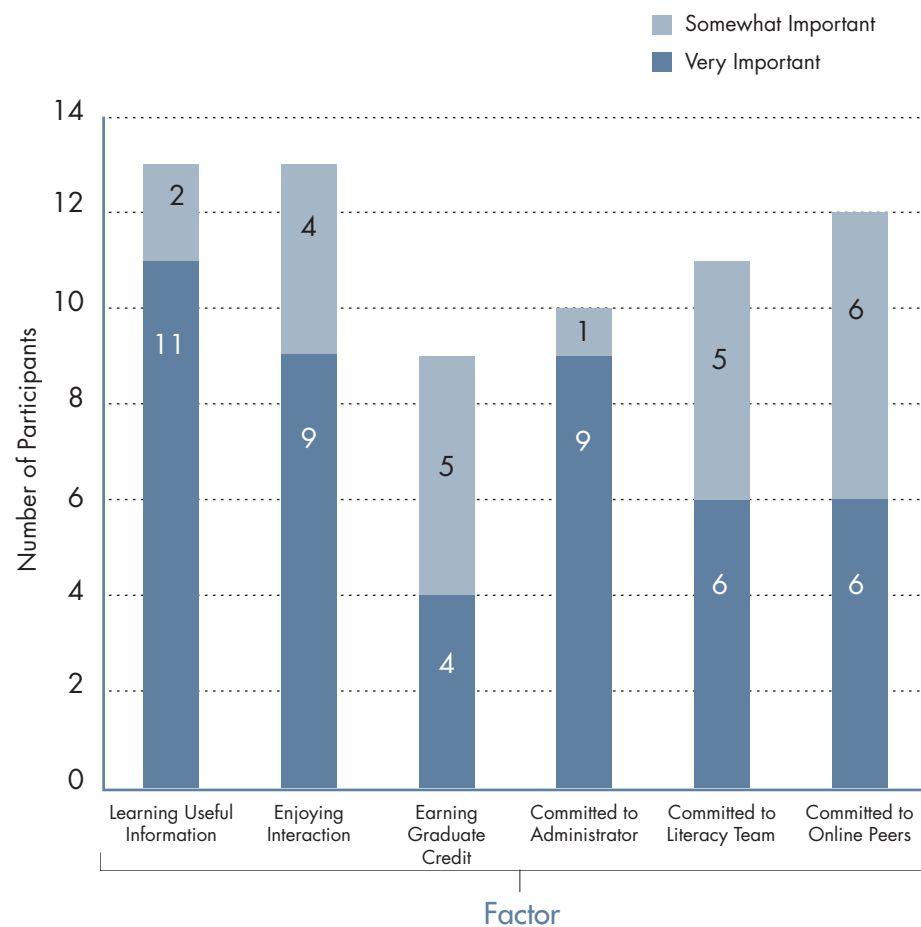
Recruitment strategy. The broader dissemination of Collaboratory information prompted inquiries from throughout the United States, resulting in two teams agreeing to participate. In e-mails and phone calls to the developers, limited professional development funding and competing school priorities were cited as impediments for many schools that initially expressed interest. The third team was recruited through existing Alliance technical assistance work.

Although our recruitment efforts resulted in a smaller number of teams than we had anticipated, the team members did have a clearer understanding of what their participation would entail. A few participants reported some initial misunderstandings about goals and expectations—especially the time commitment—but not to the degree reported in Year 1 (end-of-Cycle I questionnaire).

The online application solicited agreement to the basic requirements of participation and likely reduced confusion. Seven of the 12 original participants who completed the end-of-year questionnaire reported that they “relied heavily” or “relied somewhat” on the online application when making the decision to participate. Nonetheless, the application process did not ensure that all teachers read the information provided. Two teachers reported that they “did not receive information” from the online application or our promotional materials, although both completed online applications. They attributed their confusion about the time commitment to inaccurate information that they had received from their school administrator (end-of-Cycle I questionnaire). Said one, “Our school’s administration chose the teachers who would be involved with the Collaboratory. I had no background info other than [being] asked to participate and to complete an online application” (end-of-year questionnaire).

School teams. Year 2 school teams were more cohesive and better able to support individual teachers' professional learning. In the end-of-Cycle I questionnaire completed in late November of 2004, all 10 respondents rated their interaction with school team members as "very helpful all or almost all of the time" or "helpful much of the time." Furthermore, in the end-of-year questionnaire, 11 of the 13 respondents reported that their feeling of responsibility to their school team was either a "somewhat important" or a "very important" factor in their remaining involved throughout the year (see Figure 2). Almost all respondents also reported having incorporated literacy strategies or resources suggested by their teammates (end-of-year questionnaire). These responses indicate the presence of a more positive team dynamic in Year 2.

FIGURE 2: FACTORS INFLUENCING RETENTION



One possible influence on this dynamic was the revised application process, which suggested that prospective participants work as a team to identify a common set of commitments. Two other possible influences were prior teaming experience and the face-to-face team-building activities incorporated into the Orientation Institute. Two of the three teams had worked together in a similar capacity before beginning the Collaboratory (team applications), and all teams had an opportunity to “gel,” in

the words of one participant, during the orientation (orientation evaluation). In fact, 7 of 11 respondents acknowledged that the orientation “affect[ed] [their] decision to stay involved in the Collaboratory and/or create[d] a sense of commitment to participate fully” (end-of-year questionnaire).

Administrative support. Administrative support was not a significant challenge, partly because of the supporting role played by the team leaders. Each team leader had a slightly different approach to the role, as described below, but all served as advocates and models for their teams.

At one school, the literacy director served as team leader and also participated as an English teacher. Although the developers did not have contact with the school principal, the team leader served as a reliable liaison and a strong supporter of the team (team leader conference calls, e-mails from team leader). In addition, the team reported that its entire school had made a commitment to improving student literacy (team application). Reflecting this commitment, the principal occasionally inquired about their Collaboratory work (end-of-year questionnaire). All Literacy Team members had easy access to video equipment to record their lessons (end-of-year questionnaire). Only the team leader reported receiving extra pay and reduced work responsibilities from the school administration to support his Collaboratory work (end-of-year questionnaire). Although two team members said they had needed extra time and pay, they continued to participate without these perquisites. The positive team dynamic—due in part to the leader’s strong supporting role—factored in their decisions; the same two team members reported that their feeling of responsibility to the team had been a “somewhat important” or “very important” factor in their retention (end-of-year questionnaire).

At the second school, the principal recruited the team members, secured funding for the team’s participation (e-mails from team leader), and occasionally asked some team members about their Collaboratory work (end-of-year questionnaire), but he had little direct contact with the developers. The team leader was a well-respected school veteran who also participated in all of the activities as a teacher. She communicated regularly with the developers and created her own supports for the team, such as setting up a weekly meeting time in the school computer lab (team leader conference call, 11/17/04). However, at this school, the principal also recruited three of the five participants for other important school leadership tasks, and their limited time contributed to a pattern of lateness and incomplete assignments in Cycles II and III (team leader conference call, 2/16/05; assignment logs). Even finding the time to meet as a team proved challenging because of these other commitments. The team leader reported, “I had difficulties scheduling peer observation and team meetings because many of my team members were engaged in school improvement, and other leadership activities” (end-of-year questionnaire). Interestingly, the three original team members all rated the commitment that they had made to the principal as a “very important” factor in their continued involvement. They also rated their feeling of responsibility toward each other as teammates as a “somewhat important” or “very important” factor.

At the third school, the principal served as team leader, recruiting the team, attending the orientation, and participating in most team leader conference calls. He also observed some Collaboratory lessons but did not participate in the team's online activities (team leader conference call, 2/16/05). Because of this limited involvement, the principal was less familiar than the other team leaders with the day-to-day concerns of his team members, and he was sometimes unable to answer questions raised about their progress. However, he provided other forms of support. Literacy Team members at this school received extra pay for their participation, and one reported a reduction in other non-teaching responsibilities during the year. They occasionally submitted assignments late, but overall, their commitment reflected the high standard of involvement set by the principal. All four team members rated their commitment to the principal or other administrator as a "very important" factor in their decision to remain involved throughout the year.

These three distinct patterns of administrator involvement suggest that a highly involved principal is not a necessity for a Collaboratory team's success, but a reliable team leader—and a regular forum for communicating with team leaders—is. However, the difficulties of the second school do underline the importance of administrators' supporting the Collaboratory work in other concrete ways, such as reducing the non-teaching responsibilities of team members. The experience of the third school also suggests that team leaders who participate in all Collaboratory activities are better able to serve as spokespeople for their colleagues' concerns.

Graduate credit. In Year 2, one positive retention pattern continued from Year 1: All participants who had registered to receive graduate credit remained actively involved throughout the year.

Overall Satisfaction

The main sources of dissatisfaction reported by yearlong participants in Year 1 were (1) limited peer feedback due to attrition and (2) technology-related problems, including confusion navigating the online environment and unreliable access to video equipment. Because retention was not a serious problem in Year 2, limited peer feedback due to attrition was largely avoided. Some frustrations with technology remained, although they were less significant than in Year 1. In general, satisfaction with the other elements of the Collaboratory was higher in Year 2, with overall ratings very positive.

Technology-related problems. Technology-related problems were still a serious concern for two participants and an occasional concern for six others, or half of the respondents. Three indicated that these problems were school based, including lack of reliable Internet access. For one school, where few teachers had computers with Internet access in their classrooms, this problem was resolved mid-way through the second cycle, when one of the developers arranged with the regional technology director to provide laptops with Internet access to all team members.

Although the developers found the new online environment, Moodle, more intuitive and user-friendly than SITESCAPE, more than half of the participants still reported occasional confusion about directions for assignments and posting locations (end-of-year questionnaire).

Access to video equipment was not reported as problematic. However, one respondent reported difficulty in finding someone (presumably a teacher from outside the team) who was willing to videotape her lessons and her teammates' lessons (end-of-year questionnaire).

Time commitment. Only three participants described finding the time to schedule peer observations and meetings as a “consistent” challenge; in addition to their Collaboratory responsibilities, these three either served on a school improvement committee or had teammates who did.

Content. Most participants found The Knowledge Loom's Adolescent Literacy spotlight a useful resource for improving their instruction. On a four-point scale in which 4 denoted “very helpful” and 1 “never helpful,” 12 of the 13 respondents to the end-of-year questionnaire rated its helpfulness in their “professional thinking and learning about literacy instruction” as 3 or 4. However, one of the three math teachers selected the response “I have not learned anything I feel I can incorporate,” and another math teacher reported incorporating only one or two ideas from the spotlight (end-of-year questionnaire). These concerns echo the need expressed in Year 1 for more resources on the spotlight dealing specifically with literacy in the math classroom. Science teachers in Year 1 had voiced a similar concern, but the Year 2 cohort seemed to find more useful material than their predecessors had. All four Year 2 science teachers reported having incorporated spotlight ideas into their lessons three or more times (end-of-year questionnaire).

Changes to the Year 1 Lesson Idea assignment (renamed the Problem Scenario and Anticipation Guide assignment) ensured that Year 2 participants read the other main content source, *Adolescent Literacy Resources*; however, feedback was still somewhat negative. Seven of the 13 questionnaire respondents rated the publication's helpfulness as 1 or 2, and eight participants endorsed the suggestion on the questionnaire that we replace or supplement it with “direct excerpts from articles or books that offer practical teaching ideas but don't describe research findings.” Six participants supported the suggestion to replace or supplement the text with “direct excerpts from real research articles.”

Facilitator and coaches. Participants' satisfaction with the facilitator and coaches was higher in Year 2. Twelve of the 13 participants rated the helpfulness of feedback received from both the facilitator and their content-area coach as 3 or 4 (end-of-year questionnaire). Nine reported having incorporated ideas from the facilitator, coaches, or other Collaboratory staff three or more times. However, almost half of the respondents indicated that they would have liked to receive more timely feedback from these online experts.

Face-to-face activities. Participants were most enthusiastic about the usefulness of the face-to-face Literacy Team activities (peer observations, debriefing, and team meetings with video clips), with 9 of the 13 questionnaire respondents rating these interactions as 3 or 4 (end-of-year questionnaire). As one team leader explained, “Team feedback and development was crucial. Our team experience grew richer over cycles and I felt it superceded the online feedback” (end-of-year questionnaire). Other participants were enthusiastic about the online interaction with content-area colleagues, with six rating this as 4 and the remaining seven as 3 (end-of-year questionnaire).

Overall rating. Participants found the Collaboratory a worthwhile, enjoyable experience (end-of-year questionnaire). Ten of the 13 questionnaire respondents “agree strongly” that their participation “helped to improve teaching practice,” and 11 “agree strongly” that it “helped...to address students’ literacy needs” (end-of-year questionnaire). One participant’s enthusiastic feedback at the end of the year was typical of the strong positive response:

Note: In this and all other written quotes from participants, original spelling and punctuation have been preserved. Names have been removed to preserve anonymity.

Our school is committed to professional development and expects staff to put aside an extraordinary amount of time into it. We have had monthly workshops and weekly mtgs improving our practice, yet none of the time we have allocated this year has been as useful to my teaching as the Collaboratory has been. Their fully intergrated model of a yearlong team approach to Literacy has improved the way I teach dramatically. By reading excerpts of the best research on literacy practices, investigating practices in more depth on the Knowledge loom website, experimenting w/strategies in my classroom and then planning a lesson that I get observed teaching and receive feeback from a multitude of colleagues, I have become a better teacher. The colloboratory model is one that we sould seek to emulate in order for our pfeessional development time to be worthwhile and a valuable use of our time. (End-of-year questionnaire)

Engagement With Content

Because of the difficulty in Year 1 with participants completing the *Adolescent Literacy Resources* reading and understanding the connection between this reading and practical teaching concerns, we added a new assignment to the curriculum in Year 2: the Problem Scenario and Anticipation Guide. This assignment combined two new activities, one using a problem scenario to spark interest in the reading and generate reflection on individual practice, and the other using an anticipation guide to activate prior knowledge and provide a purpose for reading. Unlike the parallel Lesson Idea assignment from Year 1, this assignment necessitated completion of the reading, and in fact all teachers did complete it, with only one posting being a few days late.

Drawn from conversations during the Orientation Institute, the problem scenario was a paragraph-long description of a classroom in which a teacher faced a set of challenges related to the main topic of the cycle (e.g., student motivation).

Participants were asked to identify the key issues in the problem scenario before reading and to propose a solution to the problem scenario after reading. The problem scenario activity was based on similar activities used in problem-based learning environments (Derry et al., 2004; Feger, 2004; Zibit, personal communication, 4/28/04).

The anticipation guide is a commonly used adolescent literacy strategy described in *The Knowledge Loom*. This version was a series of controversial statements related to the reading, with two columns following each statement: the first was for teachers to explain their agreement or disagreement with the statement before reading, and the second was for them to explain how the reading affected their position, referring to specific ideas that either changed or reinforced their view.

The Problem Scenario and Anticipation Guide assignment was designed to promote greater cognitive engagement with *Adolescent Literacy Resources* (ALR). Among the six science and social studies teachers, four demonstrated a high level of cognitive engagement (“ALR 4 – Analysis”), analyzing the reading to identify patterns and relationships among different researchers’ findings and between these findings and their own ideas. One teacher went even further, outlining key segments of a lesson plan that incorporated ALR strategies (“ALR 5 – Synthesis/Evaluation”). (See Table 10.)

TABLE 10: COGNITIVE ENGAGEMENT CODES FOR PROBLEM SCENARIO & ANTICIPATION GUIDE ASSIGNMENT

Name of Code*	Number of Postings
ALR 5 – Synthesis/Evaluation	1
ALR 4 – Analysis	4
ALR 3 – Application	-
ALR 2 – Comprehension	1
ALR 1 – Knowledge	-
ALR 0 – No Engagement	-

*Code in boldface is the targeted level of cognitive engagement for the assignment.

The assignment also naturally led into an exchange of teaching ideas that were grounded in the reading. Whereas in Year 1, teachers remained in online “silos” for the Lesson Idea assignment, choosing discrete strategies from the Loom and responding in perfunctory ways to one another’s ideas about these strategies, this assignment asked teachers to focus first on a common set of concerns—and their resulting conversations could barely be contained. In one typical exchange, a science teacher’s posting inspired 15 more postings by the science coach, online science

colleagues, and the teacher herself about strategies that they had tried, from paired reading to the use of non-textbook sources. Although we did require responses to the anticipation guide postings, the number of responses far surpassed the requirements.

Engagement With Facilitator and Coaches

Because we had difficulty in Year 1 encouraging participants to engage with the facilitator and coaches, we made the directions for interaction more explicit for each assignment and also made a few structural changes. For example, to support the strategy experiment activities, we added an extra assignment (Strategy Reply) requiring participants to respond to feedback before experimenting with the strategy. The following week, the directions asked them to report on the strategy experiment (Strategy Report), using prompts that directly requested explanations for their observations (e.g., “What worked well? How do you know?”). We also required the coaches rather than the facilitator to reply to these postings to encourage more concrete, content-specific discussion.

TABLE 11: COGNITIVE ENGAGEMENT WITH COACHES FOR STRATEGY REPLY & REPORT ASSIGNMENTS

Name of Code*	Number of Postings
Facilitator/Coach 5 – Synthesis/Evaluation	1
Facilitator/Coach 4 – Analysis	
Facilitator/Coach 3 – Application	1
Facilitator/Coach 2 – Comprehension	4
Facilitator/Coach 1 – Knowledge	
Facilitator/Coach 0 – No Engagement	

*Code in boldface is the targeted level of cognitive engagement for the assignment.

Participative engagement for both the Strategy Reply and Strategy Report assignments was high. Eleven of the 12 participants completed both assignments, with one Strategy Reply posting being two days late and one Strategy Report posting one day late. Among the six science and social studies teachers, three posted Strategy Replies in which they demonstrated understanding of their coaches’ suggestions and responded to their questions (“Facilitator/Coach 2 – Comprehension”) (see Table 11). One did not complete the Strategy Reply assignment but discussed her coach’s feedback in depth in her Strategy Report. Another responded briefly to a coach’s question in her Strategy Reply (“Facilitator/Coach 1 – Knowledge”) but in her Strategy Report discussed how she had applied some of the coach’s suggestions (“Facilitator/Coach 3 – Application”). The sixth

teacher’s Strategy Reply not only synthesized the coach’s suggestions, but also incorporated ideas that she had gathered from other postings with science peers (“Facilitator/Coach 5 – Synthesis/Evaluation”):

I am using all three of your ideas in my unit on volcanoes....The students wrote their first attempt at summaries today with rewrites being worked on tomorrow. (I took that idea from [Teacher 1] and his abstracts...) We did the Anticipation guide last Friday and from that and class discussion I have figured what they do not know and what they want to learn. I have put together a packet with with keys concepts, ideas, and terms that they will be answering using their books and the articles that they have brought in regarding Mt. St. Helens. ([Teacher 2]/[Teacher 3’s] idea). I will then be dividing the classes up into 5 groups and give them a topic regarding volcanoes which they will first teach to their classmates for rehearsal and then each group will be teaching to either a 2nd or 3rd grade class. ([Science coach’s] idea) The student’s are loving this activity.

Interestingly, the higher level of engagement with online coaches and the more explicit request for explanations of a strategy’s success or failure corresponded with only a slightly higher level of reflection in the Strategy Reports themselves. Most Strategy Reports contained description (“Experiment 2 – Comprehension”) rather than detailed explanation of the reasons for effectiveness or ineffectiveness (see Table 12). Only one teacher’s posting—the same one that included a belated application of the coach’s suggestion—rose to the level of analysis (“Experiment 4 – Analysis”).

TABLE 12: COGNITIVE ENGAGEMENT WITH STRATEGY EXPERIMENT FOR STRATEGY REPORT ASSIGNMENT

Name of Code*	Number of Postings
Experiment 5 – Synthesis/Evaluation	
Experiment 4 – Analysis	1
Experiment 3 – Application	
Experiment 2 – Comprehension	4
Experiment 1 – Knowledge	1
Experiment 0 – No Engagement	

*Code in boldface is the targeted level of cognitive engagement for the assignment.

Engagement With Peers

The developers made a number of changes to improve peer-to-peer engagement, especially to guide the lesson observation and reflection process. First, we added more explicit requirements for responding to peer postings. Second, we designed the weeklong Orientation Institute to build a sense of community and a common literacy language among school teams, content-area groups, and the entire cohort. At the orientation, we also introduced a new set of lesson observation guidelines and a simplified observation template. Acknowledging that lesson observations put teachers in a vulnerable position that requires sensitivity from their peer observers, we modeled the use of the template and had participants practice using it. We also modeled the post-observation debriefing, eliciting a list of tips from the group on how to ensure that these meetings would be supportive and useful. Finally, we created a structure for school teams to provide targeted feedback on lesson videos.

The Lesson Reflection postings indicate that the lesson observation process was generally successful. Ten of the 12 Cycle I participants completed their lesson reflections, with none late. Among the six social studies and science teachers, four showed the highest level of cognitive engagement (“Lesson 5 – Synthesis/Evaluation”) (see Table 13). The fifth teacher’s lesson reflection demonstrated a slightly lower level of cognitive engagement (“Lesson 4 – Analysis”), and only the sixth was at the level of description, rather than detailed explanation (“Lesson 2 – Comprehension”).

TABLE 13: COGNITIVE ENGAGEMENT WITH LESSON IMPLEMENTATION FOR LESSON REFLECTION ASSIGNMENT

Name of Code*	Number of Postings
Lesson 5 – Synthesis/Evaluation	4
Lesson 4 – Analysis	1
Lesson 3 – Application	
Lesson 2 – Comprehension	1
Lesson 1 – Knowledge	
Lesson 0 – No Engagement	

*Code in boldface is the targeted level of cognitive engagement for the assignment.

Teachers integrated peer feedback into their lesson reflections, as opposed to adding it as an afterthought. For example, in the posting below (which demonstrates the levels of “Lesson 5 – Synthesis/Evaluation” and “Peer 5 – Synthesis/Evaluation”), a social studies teacher draws on a peer observer’s feedback to brainstorm adaptations to her lesson plan:

What did you feel were the most effective aspects of the lesson?

I introduced the lesson by having the students write their first name w/ "the Great" following it—they then had to write what made them great—I enjoy having the students reflect on what good qualities they have. After the notes on Alexander, I had the students do paired reading, each pair having a different text based on their reading levels—they seemed to really enjoy this.

Summarize the comments made by your observing colleague.

There is a consistent structure to my class so that students are comfortable knowing what is expected. My quickwrite introduced the lesson well but I could have emphasized it more by having the students share it afterwards. We both contemplated how I could get across the notes/facts about Alexander's life faster so as to focus on the essential question and the skills needed to answer it more. The paired reading w/different texts worked really well—could I model pre reading, during reading and post reading activities more? Was it necessary to do the Historical background report at this time?

What would you change about this lesson if you were to teach it again?

Have the students share what makes them great. Give the students an outline of Alexander's life and have them find the facts based on the reading. Model anticipation of what will the text be about as a pre reading exercise, have students underline important point and circle words they do not know as they are reading, fill in outline as post reading activity. Continue essential question exploration possible as a follow up lesson because of time—have students write why they think historians view Alexander as great—then have (socratic seminar?) discussion about whether they agree/disagree with history's point of view. Finally have them fill out the Freyer model of greatness.

In contrast, a Year 1 lesson reflection posting shows the difference in levels of engagement with peer feedback (“Peer 1 – Knowledge”) and lesson implementation (“Lesson 1 – Knowledge”):

What did you feel were the most effective aspects of the literacy strategies incorporated into the lesson? Why?

Overall, this lesson went well. It allowed for student-centered learning.

What comments did your team mate share related to each section of the rubric after observing the lesson?

[Observing teacher] noted that students were collaborating and actively engaged in the translation or use of the language of anatomy.

What would you change about the lesson if you were to use it again?

I'm happy with the lesson, but because we had a two hour delay on the day it was planned, it was truncated and completed the following day. Fortunately, there was a stopping point in the lesson so it was possible, but I think to obtain the most student learning, it would have been better to complete it in one block.

DISCUSSION

To improve retention, overall satisfaction, and engagement, the developers made a series of design changes to the Year 2 Collaboratory.

First, we modified the recruitment strategy so that we did not merely approach schools with whom we had previous relationships; instead, we shared information about the program with the general public through The Knowledge Loom and Education Alliance Web sites, listserv and e-mail announcements, and conference presentations. We also introduced an online application process; this was an effort to identify a team of participants who are comfortable with technology and to ensure that every prospective participant received the same information about Collaboratory expectations and goals.

In addition, we transformed the orientation process from a series of three-hour visits at separate school sites to a five-day Orientation Institute at Brown with all school teams together. This new orientation format allowed us to model key activities—including the use of The Knowledge Loom Web site and the Moodle online environment—and to provide participants with guided practice in completing the activities. The orientation also incorporated literacy activities designed to build stronger working relationships among school teams and content-area groups.

We restructured the online portion of the Collaboratory so that the popular hands-on curriculum development activities were integrated throughout the year. To improve cognitive engagement, we gave more explicit directions for interaction with facilitator, coaches, and peers, and we altered the wording and substance of certain assignments.

Finally, we changed the support mechanisms in an effort to improve overall satisfaction with the Collaboratory experience. We found a more intuitive and reliable online environment; designated one Alliance staff person, the liaison, as the consistent provider of technical and logistical support for participants; and ensured that all teams had a designated team leader who participated in regularly scheduled group conference calls and direct e-mail exchanges with the developers to share concerns and report on progress. (See Appendix B for a summary comparison of Years 1 and 2.)

Our analysis of the questionnaires, e-mails, notes, online postings, and other documents from Year 1 and Year 2 shows a significant improvement in retention, a higher degree of overall satisfaction among participants who remained throughout the year, and increases in both participative and cognitive engagement demonstrated through postings. Although we do not have direct evidence of the reasons for most of these improvements, our analysis led us to a series of hypotheses, or “plausible interpretations” of the data (Bruner, 1990, p. xiii). Each hypothesis is discussed in the next section. We follow the hypotheses with an accounting of the major limitations of this study. Finally, we describe our plans for addressing the challenges that our analysis revealed.

Hypotheses

- 1 Retention improves when the recruitment and application processes convey expectations directly to each prospective participant and require their active involvement.*
-

The Year 2 participants reported less initial confusion about Collaboratory expectations than the Year 1 participants (end-of-Cycle I questionnaire), and their retention numbers were significantly higher (assignment completion logs). We suspect that the improved understanding of expectations contributed directly to the higher retention numbers and that the changes to the recruitment process were a major factor in reducing initial confusion. Rather than relying only on administrators to find appropriate teachers, discuss the Collaboratory expectations with them, and ensure their yearlong commitment, we required teachers to complete individual online applications after their administrator or a teacher leader recommended them. The online applications asked teachers to read the brochure and agree to a number of conditions for participation, including a two- to three-hour weekly time commitment. This process did not entirely eliminate confusion about expectations, but analysis of the end-of-year questionnaires suggests that it was helpful in identifying participants who understood what the Collaboratory entailed and were committed to completing it.

- 2 Satisfaction and peer engagement improve when the experience begins with a sustained face-to-face orientation in which the year's activities are modeled and practiced.*
-

The three-hour orientations in Year 1 left some participants feeling “overwhelmed” and wishing for a longer, more comprehensive introduction to the Collaboratory (Abt report, p. 5). In contrast, almost all Year 2 participants reported that the five-day Orientation Institute prepared them well for the yearlong commitment (orientation evaluations, end-of-Cycle I questionnaire). Six participants also said that the orientation helped to create a sense of commitment to participate fully in the Collaboratory throughout the year (end-of-year questionnaire).

We view the orientation as a key factor in the improvements in overall satisfaction and engagement from Year 1 to Year 2. In Year 2, we received only a few isolated reports of confusion related to the online environment (team leader conference call, 2/16/05), and 9 out of 10 respondents to the end-of-Cycle I questionnaire reported that the orientation had prepared them “very well” to navigate the environment (end-of-Cycle I questionnaire). Although this improvement could be attributed in part to the more intuitive and stable online environment, it is also likely due to the modeling and practice of online navigation during the orientation.

Participants' lesson reflection postings in Year 2 also demonstrated a higher level of cognitive engagement with peer feedback—and with the lessons themselves. We suspect that this was due in large part to the modeling and practice of activities during the orientation. Eight of 10 respondents reported that the orientation prepared them “very well” for observing peers, being observed by peers, and debriefing with peers after lesson observations (end-of-Cycle I questionnaire). Almost half of participants reported that the orientation helped them to feel more motivated and/or prepared to work as members of a team (end-of-year questionnaire). We suspect that the orientation's team-building activities helped to develop a community, both within and across teams, in which members felt responsible for contributing to each other's learning. Furthermore, we believe that the explicit modeling and practice of lesson observation, debriefing, and reflective posting communicated clear expectations about the level of engagement that was expected.

3 *Cognitive engagement with content improves when participants' specific instructional concerns are integrated into the curriculum.*

In Year 1, the social studies and science teachers' Lesson Idea postings demonstrated no cognitive engagement with the *Adolescent Literacy Resources* text. In Year 2, cognitive engagement for the parallel assignment (Anticipation Guide and Problem Scenario) was almost entirely at the high level of analysis; even more significantly, however, these postings prompted follow-up peer exchanges that were much longer than required. We believe this improvement was partly attributable to a significant curricular change. To improve cognitive engagement with the content, we connected the reading more directly to teachers' practice. In an orientation activity, discussions focused on having teachers describe specific instructional challenges; we wrote the problem scenario for the first 10-week cycle of the Collaboratory by combining their listed challenges with the motivation issues explored in *Adolescent Literacy Resources*. We suspect that seeing their own specific concerns reflected in the problem scenario and connected to issues in the text gave participants an added impetus to complete and reflect on the reading—and to follow up with their peers after they had posted these reflections.

4 *Having a designated team leader who participates in regular conference calls with program staff improves communication and efficient resolution of problems, thus influencing retention and overall satisfaction.*

As developers, we found it much easier to maintain open communication with all participants in Year 2 because teams had designated spokespeople who took part in regularly scheduled conference calls. Thus, concerns that may have developed into major frustrations could be quickly and easily addressed through these calls and e-mail communications. We suspect that improvements in retention and overall satisfaction in Years 2 were due in part to the support provided by the team leaders.

■ Limitations of the Study

The scope of this study was necessarily narrow. Because of the early stage of the Collaboratory project and limited resources for research and development, the developers focused on describing participants' retention, overall satisfaction, and engagement (as demonstrated through online postings) during Years 1 and 2 and on gathering preliminary evidence about the efficacy of the design changes. Some of the limitations of this approach are listed below.

- 1** The study does not provide systematic evidence of change in teacher practice as a result of participation in the Collaboratory. However, pre-participation questionnaires, videotaped lessons, lesson plans, and end-of-year questionnaires could be analyzed in a future study for evidence of how teachers incorporated new literacy instruction strategies into their planning and teaching.
- 2** The study does not gauge long-term effects of Collaboratory participation on teacher practice. The developers did not gather any evidence from Year 1 participants to determine whether they continued to incorporate the literacy instruction strategies or to collaborate with their Literacy Team members or online colleagues. However, such evidence could be gathered in the future.
- 3** The developers could not control many of the variables that may have affected the success of the implementation in each year. These variables include the differences between teachers and schools in Year 1 and Year 2, the replacement of the facilitator and one coach, and the potential improvement in coaching skills of those who coached in both years. This limitation is an issue for any design research (Collins et al., 2004), and it contributed to the tentativeness of our conclusions.
- 4** The study was conducted by the two developers of the Collaboratory, whose biases may have affected the analysis. We sought to minimize our bias by relying heavily on the words of participants themselves to describe and explain satisfaction and retention levels. However, the coding of online postings to measure engagement introduced another level of subjectivity into the analysis, a risk because all three coders were involved in the Collaboratory and invested in its improvement. To minimize biased codings, we established consistent definitions, guidelines, and, where possible, benchmark postings. However, trained coders uninvolved with the Collaboratory would have further reduced the threat of bias.
- 5** There were differences in data collection instruments between Year 1 and Year 2. Although the developers relied on some common forms of data (e.g., online postings, e-mail communications from participants, notes from phone calls and meetings with participants), the central data sources for measuring satisfaction and retention (e.g., Abt report in Year 1 and end-of year questionnaire in Year 2) were not consistent. As a result, quantitative comparisons of satisfaction levels and sources of satisfaction, dissatisfaction, and attrition were not possible.

■ Remaining Challenges

The development of the Collaboratory design is an iterative process. Our analysis of Year 2 revealed a number of challenges that we will seek to address in Year 3. Three of the key challenges and our plans for addressing them are described below.

Challenge 1: Recruiting Teams

Although the developers' marketing efforts in Year 2 attracted two teams that were well prepared and committed to participate, we relied on previous contacts to recruit a third team and were unable to find a fourth or fifth team that could afford the participation fee. For Year 3, we attempted to expand the reach of our publicity and to contact schools and districts earlier so that interested sites had sufficient time to identify the necessary funds. Thus far, this strategy has proved more effective. Our Internet publicity generated the interest of one administrator who was able to fund an entire cohort consisting of five teams from his district. Positive word-of-mouth from one Year 2 team led to recruitment of another district-wide cohort, funded partly by LAB funds and partly by fee-for-service contracts. A third cohort of teams from around the country was recruited through a combination of Internet publicity, e-mails targeting recipients of professional development and/or school improvement grants, and previous relationships with districts or regions. The Year 3 recruiting process shows progress, but the developers seek to improve the reach of their marketing efforts.

Challenge 2: Improving the Promptness and Completion of Postings

Although the postings analyzed for this study showed an improvement in participative engagement from Year 1 to Year 2, late and incomplete postings were still a concern in Year 2. Some problems with lateness and completion are to be expected in any program that works with busy teachers. The end-of-year questionnaire and team leader conference calls identified two main reasons for the lateness and completion problems: (1) significant competing responsibilities, such as school improvement team membership, and (2) school schedules that conflicted with Collaboratory assignments. The developers can address the first by continuing to encourage administrators to reduce the non-teaching responsibilities of participants. However, we may have more influence over the second. Although we had consulted school testing and vacation schedules when planning Year 2, some dates changed and other school events, such as a science fair and exam review days, interfered with participants' ability to schedule lesson observations. We are now exploring ways to introduce more flexibility into the Year 3 schedule so that unanticipated conflicts do not interfere substantially with participants' ability to collaborate with one another.

Challenge 3: Encouraging Higher Engagement

Although the Year 2 postings demonstrated higher levels of participative and cognitive engagement, the developers identified a few assignments that did not solicit the high level of reflection or interaction that we had expected. For example, in the Strategy Report postings, rather than analyzing the reasons for the effectiveness or difficulty of applying a literacy strategy in their classrooms, participants provided basic descriptions of what happened, with very little evidence of reflection. Because of the high level of cognitive engagement demonstrated in other postings, we concluded that we may not have communicated our expectations for this assignment clearly. As a result, in Year 3, we plan to revise the directions, referring explicitly to the level of thinking that each posting should demonstrate, in the language of Bloom's taxonomy.

We will also incorporate discussion of the taxonomy into the modeling of postings during the Orientation Institute and into the guidelines for facilitators' assessment of postings. We found the taxonomy a useful basis for coding the postings, and Warren and Rada (1999) observed that university students could use it successfully to assess each other's posted comments. Although we do not plan to ask participants to assess each other's postings, we suspect that the taxonomy will be a useful guide in crafting their postings—and for the facilitator's assessment of their work.

The developers are planning a number of other small revisions to the curriculum, content, and structure of the Collaboratory, based on our findings. In Year 3, we hope to determine whether these refinements, and the plans described above, have a positive influence on participants' experience. We also plan to investigate how best to adapt the Collaboratory model to fit teacher professional learning needs in other critical areas in addition to adolescent literacy.

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APPENDIX A

Coded Lesson Reflection Postings From Year 1 and Year 2

Lesson Reflection Assignment, Year 1

This assignment was designated as requiring the following types of engagement: “Lesson 4 – Analysis” and “Peer 1 – Knowledge.”

DIRECTIONS

- Plan and teach your lesson, arranging for an on-site Collaboratory colleague to observe and videotape it. Your colleague should follow the observation guidelines/rubric that will be posted on the forum to make helpful comments.
- Meet afterwards to discuss your colleague’s impressions and your own impressions and to consider what you might want to change when you implement the lesson again. Save a copy of your colleague’s completed rubric to bring to the critical friends visit in June.
- Post your lesson, including a short response to each of the following questions:
 - 1 What did you feel were the most effective aspects of the literacy strategies incorporated into the lesson? Why?
 - 2 What comments did your teammate share related to each section of the rubric after observing the lesson?
 - 3 What would you change about the lesson if you were to use it again?

Posting A, Year 1

This posting was coded as demonstrating the following types of engagement: “Peer 1 – Knowledge” and “Lesson 1 – Knowledge.”

What did you feel were the most effective aspects of the literacy strategies incorporated into the lesson? Why?

Overall, this lesson went well. It allowed for student-centered learning.

What comments did your teammate share related to each section of the rubric after observing the lesson?

[Observing teacher] noted that students were collaborating and actively engaged in the translation or use of the language of anatomy.

What would you change about the lesson if you were to use it again?

I'm happy with the lesson, but because we had a two hour delay on the day it was planned, it was truncated and completed the following day. Fortunately, there was a stopping point in the lesson so it was possible, but I think to obtain the most student learning, it would have been better to complete it in one block.

Posting B, Year 1

This posting was coded as demonstrating the following types of engagement: “Lesson 2 – Comprehension” and “Peer–No Engagement.”

Reflection:

I feel that the lesson went very well overall. 3 points that I thought worked excellent was the game in the beginning that really got students angry. The Venn diagram made the comparison very visible. Finally, having the students work in pairs really helped them to read the Magna Carta (a tough primary source) and decipher the meaning. Most students worked very well together. Unfortunately the taping of my lesson did not go so well. The students who came into the classroom on the first day were about twenty minutes late, so the entire introduction game was not recorded. The second day I used a camera on a tripod, however the battery ran out half way through and my closing discussion was not recorded. My teammates have yet to see the video, as soon as they do, I will comment on their critical thoughts. [These comments were never posted.] Finally, several changes I would make right off the bat is that I would have used a KWL chart, as I had planned. I found that some kids knew about the Magna Carta, while others had no clue what it was. I also would have had them come to the board to fill in the Venn diagram instead of me simply taking suggestions from their seats. I believe the kids would have enjoyed moving around the classroom. Overall I felt that the lesson was very successful and the kids got valuable practice reading a difficult primary source

Posting C, Year 1

This posting was coded as demonstrating the following types of engagement: “Lesson 5 – Synthesis/Evaluation” and “Peer 3 – Application.”

Overall the mock press conference went well. All of the students were motivated and actively engaged. The format was somewhat new to them, which inspired them to conduct in-depth research and thorough preparation. After conducting research students wrote position papers in preparation for their roles. Students also used a peer editing form to evaluate a partner's work. Students then revised their first drafts. So, the lesson incorporated collaboration and interaction. A few days before the mock press conference, an intern and myself modeled the simulation for the students. The lesson incorporated reading, writing, speaking, and listening. The role playing process really helped students understand point of view, frame of reference, and historiography. Debriefing afterward enabled the class to step away from their roles, give feedback, and share findings from today's perspective.

My team mate...thought that the lesson was imaginative and different, which may have increased motivation. She also thought that the public speaking aspect motivated students to prepare and perform fairly well. [She] commented that the lesson was student-centered.

The two of us agreed that in the future it may be better to emphasize more the history of the muckrakers so that students would have a greater understanding of what contributions they made. Both of us observed that the students, for some reason, asked far more questions of Carnegie than of Rockefeller or Morgan. So I probably should have asked to see a list of questions from each muckraker to ensure that all three moguls received equal attention. I would also try to encourage students to “live” their roles to a greater extent. No one seized the opportunity of extra credit for “dressing the part.” If I were to use this type of lesson with some of my other classes, I would most likely have to adapt it.

Lesson Reflection Assignment, Year 2

This assignment was designated as requiring the following types of engagement: “Lesson 4 – Analysis” and “Peer 1– Knowledge.”

DIRECTIONS

- 1** Complete your lesson plan, using the lesson template under Collaboratory Resources.
- 2** Meet with your observer to discuss your goals for the lesson (optional).
- 3** Teach your lesson between October 20 and October 29, 2004. As you teach, one teammate observes, using and completing the Revised Lesson Observation Guide, and someone else tapes the lesson. You will also have an observer role as one of your teammates teaches. (Remember that it’s best to have someone other than the observer videotape the lesson.)
- 4** Engage in a post-lesson meeting with the team colleague who observed you. See Tips for Post-Observation Conversations, under Collaboratory Resources. Keep a copy of the completed Revised Lesson Observation Guide for Part #5, below.
- 5** Complete a reflection on your lesson:
 - What did you feel were the most effective aspects of the literacy strategies incorporated into the lesson? Why?
 - What comments did your teammate share related to each section of the lesson observation guide? Include a few of their comments about the strengths and challenges/observations mentioned.
 - What would you change about the lesson if you were to use it again?

Posting D, Year 2

This assignment was coded as demonstrating the following types of engagement: “Lesson 2 – Comprehension” and “Peer 1 – Knowledge.”

What did you feel were the most effective aspects of the literacy strategies incorporated into the lesson? Why?

I felt that the entire project was worth spending the extra time on because the students had almost complete ownership in the project. They prepared the books, they shared their books with a group of students much younger than themselves, they decided how their books should be evaluated, and they evaluated them.

What comments did your teammate share related to each section of the lesson observation guide? Include a few of their comments about the strengths and challenges/ observations mentioned.

They really liked the idea of the students leading all aspects of the completed project. I realize that having 11th and 12th graders is helpful in that respect, but I was really impressed with the final part of the project in particular. The first graders seemed to really enjoy and take an active part in what was going on as well.

What would you change about the lesson if you were to use it again?

I regret that we didn't video a little bit of some of the other stages of the project such as producing the books, the class setting up the scoring guides for peer grading, and the classes grading the books. The part that was videoed doesn't do the rest of the project parts justice.

Posting E, Year 2

This assignment was coded as demonstrating the following types of engagement: “Lesson 4 – Analysis” and “Peer 2 – Comprehension.”

[My colleague] observed me during this introduction to Land & Soil Resources. Today was the student’s second exposure to an anticipatory guide. This time I broke them into three groups of eight students per group. I quickly figured out real quick that that size of group was too large. In our post-lesson discussion, [my observing colleague] pointed out that also. It was easy for some of the students to be having their own discussion while the student recording the ideas was only getting the ideas from the students directly around them. I chose the groups for simplicity and time.

I felt like the students actually have a good idea about the basics of our soil and land resources. They did not know what desertification, nutrient depletion, and land reclamation meant. These are all areas that we will cover during this unit.

Personally, I feel like that students have liked these anticipatory guides. First of all it gives them a chance to tell me what they already know and secondly it lets them find out what we will be covering in the unit.

After the lesson was over I realized that I had also not posed the essential question to them directly. The question, “What can I do to protect our local and soil resources?”, is our focus throughout this unit. I want to make sure that they are aware that they can be protecting their land and soil even as seventh graders. This is also a good way to bring science into their everyday lives. The idea of the question was there throughout the lesson, but I did not pose it them directly.

At the end of this unit each student will be presenting a written plan to our local newspaper as to how they can protect their local school grounds. (My other 7th grade class, which is my lower level group, will be making posters to be placed around campus.)

Posting F, Year 2

This assignment was coded as demonstrating the following types of engagement: “Lesson 5 – Synthesis/Evaluation” and “Peer 2 – Comprehension.”

1. What did you feel were the most effective aspects of the literacy strategies incorporated into the lesson? Why?

I felt that the most effective aspects of the lit strategies were the motivation the students received from knowing they decided what criteria would be used to grade their work. Also I think the students really enjoyed the opportunity to perform a skit to display their knowledge rather than taking a test or doing a report. I think the creative aspect allowed many of them to “stretch their wings”. It gave several of the quieter students an opportunity to express themselves and my more studious students had to be more creative in their approach to school work, which I have noticed tends to be a little hard for them. I was

able to tell the students had not only learned the previous lessons but really understood how they would be used in the scientific world.

2. What comments did your teammate share related to each section of the lesson observation guide? Include a few of their comments about the strengths and challenges/ observations mentioned.

Strengths:

I was observed by [my observing colleague]. Over all, the comments made by [her] were positive. She was able to identify evidence for each instructional objective. In relation to objective # 2 [she] wrote "Most of the skits had a problem based activity and students were able to give solutions or {explained} how to solve the problem." Evidence for the Literacy objectives was also observed by [the observing colleague]. She wrote "Students worked effectively as a group. Choice seemed to have been given (the skits were different)... Students had to know the key terms and the scientific process to be able to write the skits.... Excellent use of the scientific method framework"

Challenges:

[The observing colleague] noted that in the beginning of the lesson I had instructed the students that they would be guessing what type of scientist each classmate was portraying, and this was not followed through. As I discussed with her, the students began to explicitly state what type of scientist they were pretending to be so, I felt that was not necessary to have the class "guess" what had already been told to them.

Another challenge observed was my lack of an "end" to my lesson. [The observing colleague] wrote "...The closure to the lesson was not as effective as it could have been... The teacher started to have students clean up before recapping..." The lesson extended to the following day. All the students were not able to present on the day we video tapped. I knew we were running out of time so my thought was to wrap up when everyone was finished presenting.

3. What would you change about the lesson if you were to use it again?

There are three things I would change about this lesson.

1) I would work on a rubric that was not as complicated. It was rather long with 10 sections.

2) I would make sure that I reviewed/ recapped my lesson before the students left for the day. Even if I will revisit the lesson on another day. As [the observing colleague] indicated to me all lessons should have a clear beginning, middle and end.

3) I would have a more structured outline for some of my classes. I gave everyone a very general outline and allowed them to choose everything about their skits. A few of the groups in my other classes did not do as well as the rest. I think they needed more structure.

APPENDIX B

Changes Between Collaboratory Year 1 and Year 2

ISSUE	YEAR ONE	YEAR TWO
<p>Recruitment</p>	<p>The process was mostly top-down: Developers recruited school administrators who had pre-existing relationships with The Education Alliance. Developers provided administrators with a list of key conditions to support successful Collaboratory participation (<i>Keys to Success</i>), then relied on them to recruit teaching teams.</p> <p>PROBLEMS: Administrators often identified teachers at the last minute and provided inaccurate information about the Collaboratory. Identified teams were not in place prior to the orientation. In many schools, literacy was not pre-identified as a priority. Developers had no information about participants prior to the orientation.</p>	<p>Developers conducted broader dissemination about the Collaboratory through e-mail solicitations and online announcements. School administrators who expressed interest were required to identify a pre-existing school team. The process required completion of an online team application, followed by completion of online individual applications.</p> <p>PROBLEMS ADDRESSED: Completion of the online applications demonstrated an ability to function collaboratively and encouraged early communication between administrator and participants about the Collaboratory. Only schools with acknowledged literacy priorities applied. Developers had the participants' names, e-mail addresses, and literacy-related goals prior to the orientation.</p>
<p>Orientation</p>	<p>Developers presented a three-hour orientation workshop for each school team at their home site in August and September. Orientation consisted of a brief overview of the Collaboratory and several hands-on activities that provided practice with the online tools and resources.</p> <p>PROBLEMS: Various problems arose depending on the site, but overall, the length of the orientation session did not allow for sufficient exposure to Collaboratory purpose, expectations, online resources, and the interactive environment. Incomplete orientation activities carried over into initial online work, causing some lateness with the first assignments. Level of participation and quality of responses did not meet developers' expectations.</p>	<p>Developers offered a five-day Orientation Institute at The Education Alliance in August. Teams met one another, their online facilitator, and Alliance staff face-to-face. Content-area coaches engaged with participants several times by phone to support orientation activities. Online tools and resources were demonstrated and then integrated into hands-on activities for extended practice. All aspects of online and on-site assignments and interactions were modeled and then practiced.</p> <p>PROBLEMS ADDRESSED: Participants had enough time and practice to gain comfort using online resources and experienced first-hand the type of participation expected. Participants demonstrated a higher level of timely, reflective participation that closely matched the interactions modeled during the orientation.</p>

<p>Structure of Online and Face-to-Face Activities</p>	<p>Online discussions from September to May were organized into two segments—Part I: Literacy Seminar (12 weeks) and Part II: Curriculum Lab (18 weeks).</p> <p>The Adolescent Literacy Support Framework grounded the work. Participants investigated the Framework through The Knowledge Loom Web site in Part I and reviewed concepts through assigned readings in the publication, <i>Adolescent Literacy Resources</i>, in Part II.</p> <p>Part I: Literacy Seminar was 12 weeks long. During the first two weeks, it focused on team vision. The remaining 10 weeks were divided among components of the Framework and experimenting with self-selected strategies supported by the facilitator, peers, and, to a lesser degree, the coaches.</p> <p>Part II: Curriculum Lab was four four-week cycles. Each cycle focused on review of one component of the Framework through assigned readings from <i>Adolescent Literacy Resources</i>. Participants then developed and taught a content-specific lesson in each cycle. Team members were required to observe one peer lesson each cycle and meet as a Literacy Team for one hour at the end of each cycle to reflect on the effectiveness of the literacy strategies integrated into the lesson. These activities were supported by feedback from coaches, peers, and, to a lesser degree, the facilitator.</p> <p>PROBLEMS: Separation between Literacy Seminar and Curriculum Lab activities interfered with an ongoing sense of practical application of literacy instruction strategies, contributing to attrition. Numerous participants did not complete the assigned <i>Adolescent Literacy Resources</i> readings because information seemed more analytical and less hands-on than the previous Knowledge Loom readings.</p>	<p>Online discussions from September to May were organized into three 10-week activity cycles.</p> <p>The Adolescent Literacy Support Framework grounded the work. Participants investigated the Framework through The Knowledge Loom Web site and <i>Adolescent Literacy Resources</i> during three 10-week cycles. Each cycle focused on one component of the Framework introduced through a problem scenario and anticipation guide. Problem scenarios were drawn from real-world challenges that participants had expressed during the orientation and online discussions.</p> <p>Parts I & II of Year 1 were blended into three 10-week cycles. Each cycle integrated reading about and experimenting with research-based literacy strategies (as in the Literacy Seminar) with curriculum development, application, and review (Curriculum Lab). Lesson planning was supported by feedback from the facilitator, coaches, and peers. Team members were required to observe one peer lesson each cycle and meet as a Literacy Team for two hours at the end of each cycle to reflect on the effectiveness of the literacy strategies integrated into the lessons.</p> <p>PROBLEMS ADDRESSED: The 10-week cycles fostered a more natural integration of literacy strategies into day-to-day teaching. Anticipation guide and problem scenarios situated the conversation in a real-world context, activated prior knowledge, and provided a purpose for completing assigned readings, while concretely demonstrating literacy instruction strategies. Integrating Knowledge Loom content with <i>Adolescent Literacy Resources</i> better grounded practice in theory. Longer, more directed meetings allowed for collegial sharing and team goal setting.</p>
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<p>Support Mechanisms</p>	<p>Ongoing class discussions were conducted in the asynchronous online environment, Sitescape. Collaboratory developers responded to technical problems and questions in an ad hoc fashion through e-mail. Alliance staff fielded questions that participants posed in a designated "Question and Answer" folder on Sitescape. School administrators were asked to support participants according to <i>Keys to Success</i>, the document that they had received during recruitment.</p> <p>PROBLEMS: Technical problems with Sitescape contributed to participants' confusion and frustration about where to find content and post assignments. Designated "Question and Answer" folder on Sitescape was rarely used. Reliance on individual e-mails to report and resolve technical problems was time-consuming and inefficient. Administrators were removed from day-to-day Collaboratory activities, and in some cases they did not provide the needed resources for videotaping and observing peer lessons.</p>	<p>Ongoing class discussions were conducted in the asynchronous online environment, Moodle. An Alliance staff member, designated as Collaboratory liaison, responded to all participants' technical and logistical questions. Her exchanges with participants were posted on Moodle in a "Question and Answer" discussion forum.</p> <p>Designated team leaders participated in periodic conference calls with developers and the liaison regarding concerns and progress. The team leader could be an administrator or senior-level teacher who was a full Collaboratory participant and also served as liaison with the administrator.</p> <p>PROBLEMS ADDRESSED: Moodle provided a more stable, intuitive environment that supported easy asynchronous interaction. The liaison centralized the "Question and Answer" information in a designated Moodle forum. Team leaders served as an active contact point for team members, Collaboratory staff, and local administrators. Conference calls ensured that administrators were more involved with day-to-day Collaboratory activities and therefore readily provided resources required for success. The calls also ensured that Collaboratory staff were more aware of team issues that might affect success.</p>
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