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Washington Center's Online Student Survey Validation Study: Surfacing Students' Individual and Collective Understanding of Their Learning Community Experiences

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Abstract

This article reports on findings from a mixed-methods validation study of the *Online Survey of Students' Experiences of Learning in Learning Communities*. In the quantitative part of the study, we found strong correlations among survey items related to faculty behaviors, student behaviors, and critical thinking. Factor analysis yielded four primary factors: faculty behaviors that support quality learning for all students; student behaviors that foster responsibility for their own learning; student behaviors that support collaborative learning; and, student and faculty behaviors that together create an academic learning community. For the qualitative part of the study, we worked with LC programs at four institutions to investigate whether students think about the survey items in the same way we do. These findings—and an in-depth analysis of student responses at one campus—led to unexpected outcomes and new insights regarding LC assessment, specifically what students are learning from one another. In response, we developed a companion tool to the online survey, the *Peer-to-Peer Reflection Protocol*. We conclude by addressing the potential of this guided discussion protocol to surface students' experiences of individual and collaborative learning.

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Introduction

By winter 2014, students from 62 institutions had contributed nearly 20,000 usable responses to Washington Center's *Online Survey of Students' Experiences of Learning in Learning Communities*. Four years of findings from this survey are a matter of public record.[1]

Highlights from survey administrations from 2009-10 to the present reveal the broad contours of learning community (LC) practice: most LC classrooms encourage student engagement and many LC students are learning the moves associated with integrative learning. For instance, students surveyed during the 2012-13 academic year [2] report that they often or very often are encouraged to ask questions (89%), discuss assigned work (86%), and participate in class activities (86%). To a lesser extent but still noteworthy, students often or very often "work at connecting or integrating ideas, strategies, and skills form classes/disciplines included in their LC" (77%) and "reflect on how these connections lead to new insights or understanding" (75%). Other findings indicate that, compared to their integrative learning, students report fewer opportunities for collaborative learning: students often or very often "peer review their own or others' work in class" (62%) and very often "work with classmates outside of class on course assignments, homework, or projects" (52%).

Not every participating institution's survey results replicate these national findings. The value of this field-based survey is that it situates students' experiences of learning in LCs on any individual campus within the broader context of LC pedagogy and practice.

Insofar as this online survey assessment informs professional development for LC programs as well as directions for the LC field, how valid is it?[3]

Over a six-month time frame beginning in fall 2012, we investigated this question, using both quantitative and qualitative methods. Findings from this mixed-methods approach confirm the validity of the online survey—good news all around. But some outcomes surprised us and led to a deeper investigation of a foundational assessment question: what kinds of learning do learning communities make possible? We realized that, as a field, we do not have an

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[1] https://www.evergreen.edu/washingtoncenter/survey/surveyfindings.html

[2] See posted July 2013 report, *Survey of Students' Experiences of Learning in Learning Communities: Highlights from the 2012-13 Survey Administrations.*

[3] Validity refers to the quality of being logically or factually sound. In the case of this validation research, validity is the degree to which the survey instrument assesses the concepts the research is attempting to measure.

assessment tool that surfaces the deeper collaborative learning[4] we want students to experience and that, according to our validation study findings, many do.

This article begins with a brief background on the origins of the online survey, including what constitutes a "learning community," given the survey's purpose. We then move to an account of the validation study and the findings at each step in the process, from the correlations and factor analysis results to the qualitative analyses we conducted to find out what students think about when they respond to survey items.

Our analysis of these student responses—245 in total from LC programs at four very different community colleges and universities—prompted us to reconsider both the individual and collaborative dimensions of learning in LCs. We discuss these findings in conjunction with insights from colleagues who facilitated campus conversations at the four schools: California State University–Sacramento, Holyoke Community College, Skagit Valley College, and Sonoma State University. To give readers a more nuanced description of this part of the validation study, we offer an in-depth analysis of the Holyoke Community College conversations. The summary finding and six emerging themes from Holyoke, along with our analysis of student responses to the validation study from the three other schools, led to the development of a companion tool to the online survey, the *Peer-to-Peer Reflection Protocol* (see Appendix A).

We conclude by considering this new facilitated-discussion protocol in relation to collaborative learning and the assessment challenges it poses.

Framework for the Online Student Survey

From its inception, the *Online Survey of Students' Experiences of Learning in Learning Communities* has been a field-based initiative. Designed to collect national and campus-based data about the "what" and "how" of substantive learning in learning communities, the survey focuses almost exclusively on students' experiences of learning in LC classrooms. We resisted the pressure to extend this focus when early drafts of the online survey were being reviewed at regional meetings and the national LC conference in fall 2008.

The genesis of the survey led to this single-minded focus. Campus teams who were co-researchers in Washington Center's two-year *National Project on Assessing Learning in Learning Communities* (Lardner & Malnarich, 2008/2009) wanted a simple-to-administer quantitative measure to use along with the Collaborative Assessment Protocol for examining student work[5] that Veronica Boix-Mansilla had adapted for the project based on her team's research on

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[4] In *Learning Better Together*, Vincent Tinto (2003) describes collaborative learning as "students learning together."

[5] https://www.evergreen.edu/washingtoncenter/resources/integrativelearning.html

interdisciplinarity (Boix-Mansilla, 2005; Boix-Mansilla & Dawes Duraising, 2007; Boix-Mansilla & Gardner, 2003). Campuses' use of this structured conversation protocol led us to rethink the relationship between interdisciplinary and integrative learning as well as the importance of disciplinary grounding (Lardner & Malnarich, 2008/2009). We also discovered the power of collectively examining student work in the context of curricular and assignment development. Even for veteran teaching teams, the quality of LC work advances in stunning ways (Dunlap & Sult, 2008/2009). Still, examining student work for evidence of integration proved to be time-consuming and too specific for program-level assessment purposes, unless additional assessment strategies tied to LC program and general education learning outcomes are in place (Pettitt & Muga, 2008/2009).

By the end of the national project, participants recognized that LC classrooms needed to become places where students could develop the integrative habits of mind associated with integrative learning, a characteristic identified as one of four essential learning outcomes for undergraduates by the Association of American Colleges and Universities (AAC&U) in its 2007 report, *College Learning for the New Global Century*. Our generative and non-hierarchical understanding of integrative learning was influenced by *A Statement on Integrative Learning* (2004), co-authored by AAC&U and the Carnegie Foundation for the Advancement of Teaching. This one-page account of integrative learning appreciates the diversity of students in higher education— from pre-college classes to professional programs—similar to the diversity of students served by the LC programs involved in the national project. As the statement points out,

> Integrative learning comes in many varieties: connecting skills and knowledge from multiple sources and experiences; applying theory to practice in various settings; utilizing diverse and even contradictory points of view; and, understanding issues and positions contextually. Significant knowledge within individual disciplines serves as the foundation, but integrative learning goes beyond academic boundaries. Indeed, integrative experiences often occur as learners address real-world problems, unscripted and sufficiently broad to require multiple areas of knowledge and multiple modes of inquiry, offering multiple solutions and benefiting from multiple perspectives. (n.p.)

However, as colleagues from La Guardia Community College's team noted, LC faculty were often good at "parallel play"—linking classes by theme—but not real integration (Burg, Klages, & Sokolski, 2008/2009). Cerritos College colleagues put it this way: "interdisciplinary integration needs to be grounded in

the disciplines, which means that it is necessary to reinforce those specific aspects of knowledge and thinking skills relevant to the integration" (Lardner & Malnarich, 2008/2009, p.13). Of the many productive shifts Boix-Mansilla (2008/2009) named as a consequence of this national project, teams appreciated that designing and assessing for intentional integration introduces a rigorous novice-to-developing-to-advanced trajectory into LC professional development. If we want our students to be able integrative thinkers, ongoing faculty conversations about how we scaffold opportunities for practice within the LC program and across departments becomes critical (Lardner & Malnarich, 2009).

Given the challenging work of designing integrative assignments that address public issues without diluting the disciplinary building blocks of integration, colleagues wanted a quick way to find out if students were being invited to practice integrative learning as compared to engaging in parallel play. The *Online Survey of Students' Experiences of Learning in Learning Communities*—a quantitative measure developed by Washington Center in collaboration with Skagit Valley College's Director of Institutional Research—was designed to meet this need. Survey results, combined with findings from the Collaborative Assessment Protocol, would give LC programs the means to gauge students' experiences of integrative learning *and* improve teaching teams' effectiveness. In this sense, generating professional development for campuses and the field is in the survey's DNA.

The adoption of a broad definition of LCs makes the online student survey accessible to a spectrum of LC programs.[6] For survey respondents, three choices are given for "type of learning community": either "a common cohort of students enrolled in two or more classes who attend these classes together (e.g. minimally all students in class A are in class B)" or "a cohort enrolled in a learning communities program in which students share a common experience, such as a single course, seminar, and/or integrative project," or "other." These fields, which students fill out before taking the survey, require guided instruction. Students also select one descriptor from a range of LC courses: pre-college (developmental) classes; pre-college and college-level classes; college level classes only; or "other." Given the variety of curricular and co-curricular LCs across the country, these categories represent a consensus among practitioners of who ought to take the survey.

This entry checkpoint meets the bare-bones definition of LCs in play for thirty years (Smith, MacGregor, Matthews & Gabelnick, 2004, p. 20). Stripping LCs of essential components that have made them a "high-impact practice" (Brownell & Swaner, 2009; Kuh, 2008) makes sense, given the purpose of the survey. We know that to do LCs well requires more than organizing students into

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[6] The online student survey is available for use but is not in the public domain. See *Guidelines for Participation* at https://www.evergreen.edu/washingtoncenter/survey/guidelines.html.

cohorts. When visiting an LC classroom we ought to notice a mix of practices including opportunities for integrative and interdisciplinary learning, pedagogies of active engagement and reflection, knowledge construction through collaborative meaning making, and co-curricular elements, such as those associated with active civic engagement. But the point of a *minimal* definition for LCs is to find out if students in LC classrooms in all their various renditions— linked or clustered classes, coordinated studies, freshman seminar or interest group LCs, and living-learning communities—are experiencing the quality of learning that is encouraged by the pedagogical moves associated with LCs.

In other words, the purpose of this online survey is very particular. Few questions veer from students' experiences of learning. Survey items are clustered into four topics, and the prompts reflect this concentration:

1. Students' engagement in classroom activities (13 items)
   In my learning community, I…
2. Instructors' activities that support learning (13 items)
   Teachers in my learning community…
3. Students' perceptions of gains in their understanding and abilities (10 items)
   My participation in this learning community helps me develop my ability to…
4. Students' perceptions of cognitive activities in LC vs. other courses (7 items)
   In my learning community, compared to other classes, I spend more, less, or about the same amount of time…

Content items in the first two sections draw on research on learning and effective teaching (Bransford, Brown & Cocking, 1999), insights from Washington Center's assessment project, and work on integrative learning by the AAC&U and the Carnegie Foundation for the Advancement of Teaching (Huber, Hutchings & Gale, 2005). Content items in the last two sections draw on established surveys universities and community colleges use to assess students' perceptions of their learning and engagement.[7] Based on LC coordinators' recommendations made after the first field test of the survey, we added a comparison component to the fourth section.

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[7] http://nsse.iub.edu/html/about.cfm; http://www.ccsse.org/aboutsurvey/aboutsurvey.cfm

Early vetting of the survey in classrooms in which students were doing integrative assignments led us to choose language accessible to students at all levels in their studies and to stick to the word *integrate*.

Now that the survey is being used across the country by very different schools whose LC programs are also very different—from those well-established to those just beginning—we asked, how valid is the *Online Survey of Students' Experiences of Learning in Learning Communities*?

Online Student Survey Validation Study

For the online survey validation study, we used a mixed methods approach that resulted in both quantitative and qualitative data analyses. The quantitative data—both correlations and factor analysis—addressed the question: *What are the relationships between the survey items?* The qualitative data addressed the question: *Are students thinking about the survey items in the way we expect?*

This concern with what is on students' minds when they click *very often*, *often*, *sometimes,* or *never* extends early qualitative work we did with Skagit Valley College students before releasing the online survey for a field test in fall 2009. In that instance, Skagit students' "think-alouds" when reading survey items alerted us to the perils of using teachers' talk and to the idiosyncratic ways campuses might refer to LC practice.

These think-aloud protocol results, as well as the feedback from faculty and administrators from the 11 institutions who participated in the survey field test, helped to establish the initial content validity and face validity of the survey. Content validity refers to whether survey items are appropriate to the area of study; face validity is concerned with how a measure or instrument appears "on the face of it." In other words, does the survey seem like a reasonable way to gain the information desired? Does it seem well-designed?.

After three years of survey administrations, we revisited the question of survey validity. At the end of spring term 2012, the survey database consisted of 9,318 responses from students in both two- and four-year institutions across the country and three outside of the U.S. These students were enrolled in a variety of LC courses and levels between the winter/spring 2010 term and winter/spring 2012. A summary of institution and program characteristics is provided in Table 1. This dataset was used in the quantitative portion of the validation study described below.

Table 1
Characteristics of Learning Communities by Institution Type

Learning Community Characteristic	Two-Year (%)	Four-Year (%)
Type of Learning Community		
Common cohort enrolled in 2+ classes	82.8%	79.7%
Cohort sharing common experiences	14.7%	19.9%
Other	2.5%	.4%
Level of Learning Community Courses		
Pre-college (developmental) classes	15.7%	1.8%
Pre-college and college level classes	24.5%	4.9%
College level classes only	59.0%	92.7%
Other	.8%	.6%

Quantitative Analyses

The multi-level approach used to examine survey validity and the relationships between the survey items included correlations and factor analysis.

Correlation Analysis

For those unfamiliar with correlations as a statistical tool, *correlation analysis* is used to examine the degree to which responses to survey items vary together. Correlations can be either positive or negative. If scores on one variable increase when the score on another variable increases, there is a positive relationship between the two variables. If, on the other hand, one variable increases while the second variable decreases, there is a negative relationship. Correlations range from -1 to +1. A correlation of 0.00 would mean there is no relationship between the two variables—an unlikely result. Generally, a correlation of +0.70 is considered a strong positive linear relationship, while +0.50 is moderate, and +0.30 indicates a weak but positive linear relationship. Negative linear relationships follow a similar numerical pattern.

The correlation analysis for this study included all responses in the database and all 43 survey items, resulting in a very large correlation matrix that displays correlations between all of the survey items. All correlations among the variables were positive. Rather than a re-creation of the entire matrix, Table 2 presents the results that show moderate and strong correlations among selected survey items related to faculty behaviors, student behaviors, and critical thinking. While correlations do not denote causality, the results of the analysis suggest some important relationships between faculty behaviors and student behaviors. For example, the second section of Table 2 shows that when students work on integrating ideas, strategies, or skills from the classes or disciplines included in the LC, not surprisingly, they are also likely to reflect on how these connections lead to new insights or understanding.

Table 2
Correlation Matrix, Selected Survey Items*

Student Behaviors	1	2	3	
1 Work with other students to examine complex issues during class	--			
2 Peer review my and other students' work during class	.503	--		
3 Work with other students on group projects during class	.511	.516	--	
Faculty Behaviors	**1**	**2**	**3**	
1 Work on connecting or integrating ideas, strategies, or skills from classes (or disciplines) included in this learning community	--			
2 Reflect on how these connections lead to new insights or understanding	.681	--		
3 Use what I am learning to contribute to another class	.479	.535	--	
Critical Thinking	**1**	**2**	**3**	**4**
1 Synthesizing ideas, experiences or theories	--			
2 Evaluating information, methods, and arguments	.550	--		
3 Integrating ideas, strategies and skills from multiple sources	.502	.564	--	
4 Applying theories or concepts to practical problems or new situations	.498	.523	.579	--

*All correlations are positive and significant at the .01 level (2-tailed).

Not included in this table, but noteworthy, is the finding that the survey item about the degree to which faculty "Make all students feel comfortable about participating in class activities" was moderately correlated with seven different survey items related to student engagement and learning, including: "Encourage students to ask questions" (.65), "Encourage students to discuss assigned work in class" (.57), and "Help students establish productive work groups" (.53). The importance of establishing a comfortable learning environment was also demonstrated by the moderate relationships between this item and students' reports that faculty "Encourage me to explore my ideas" (.54), "Talk to me about my ideas" (.52), "Help me use my background knowledge and life experience to learn new things" (.51), and "Demonstrate how to integrate concepts and skills from different classes in a meaningful way" (.51).

Factor Analysis

For readers who may also be unfamiliar with factor analysis, *factor analysis* is a statistical technique used to identify a small number of factors from a large number of variables—in this case, survey items. Essentially, the factor analysis simplifies the correlation matrix. In this study, exploratory factor analysis was employed to identify the primary factors that explain the correlation matrix. The results from the factor analysis constitute "loading" scores for the variables included in the analysis. A factor loading is basically the correlation of a variable with a factor.

Only 32 of the 43 survey items were included in the validation study factor analysis. Due to their content-specific nature, four items in the section regarding students' perceived gains in understanding and abilities (quantitative reasoning, speaking, writing, and critical thinking skills) were excluded from the factor analysis. And seven survey items related to students' perceptions of cognitive activities in the LC versus other courses were strongly correlated only with other items in this section, so these items were also excluded from the factor analysis.

As shown in Appendix B, four factors emerged from the analysis. The loading scores for the survey items and the associated factor ranged from moderate (0.435) to high (0.784). As a research team, we identified the four factors as:

1. Faculty behaviors that support quality learning for all students,
2. Student behaviors that foster responsibility for their own learning,
3. Student behaviors that support collaborative learning, and
4. Student and faculty behaviors that, together, create an academic learning community.

These four factors reflect key dimensions of students' experiences of learning in LCs consistent with the original concepts used to create the survey.[8] These factors can be used by researchers and practitioners to provide credible summary data to administrators, the campus community, trustees, and other stakeholders. For instance, a college would be able to compare benchmarks over time and/or in relation to other similar institutions as illustrated in Table 3.

Table 3
Benchmark Data for Community College X and All Two-Year Institutions, Fall 2010 & Fall 2011

	Community College X		All Two-Year Institutions	
	Fall 2010	Fall 2011	Fall 2010	Fall 2011
Faculty behaviors that support quality learning for all students	3.63	3.79	3.49	3.56
Student behaviors that foster responsibility for their own learning	3.32	3.43	3.26	3.32
Student behaviors that support collaborative learning	2.85	2.91	2.90	3.00
Student and faculty behaviors that, together, create an academic learning community	3.64	3.88	3.48	3.53

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[8] The factor analysis represents a *statistical* relationship between the survey items whereas the survey categories and the associated survey items represent an a priori *conceptual* relationship.

In summary, the findings from the quantitative analysis, including both the correlational data and the factor analysis, underscore the validity of the online student survey. The evidence indicates that the survey measures what it was designed to measure in terms of the relationship between faculty and student behaviors, integrative learning, and critical thinking.

Qualitative Analysis

For the qualitative portion of the validation study we wanted to know what experiences of learning came to mind when students responded to survey items. Given our aim to develop a simple-to-administer quantitative measure that could be used to complement the Collaborative Assessment Protocol for examining student work, we were particularly interested in items focused on integrative learning.

Often the best way to learn what students think is to ask them. Fortunately, we were able to work with faculty and staff from LC programs at two four-year schools in California, Sonoma State University and California State University (CSU)–Sacramento, and from two community colleges, Skagit Valley College in Washington and Holyoke Community College in Massachusetts, to solicit direct feedback from students.

While all these LC programs have stood the test of time, ranging from 20 years to 45 years, they proved to be diverse in terms of structure, history, and the student population served. For instance, the two four-year LC programs are quite different: CSU Sacramento's program focuses on providing transitional support for educationally and economically disadvantaged students from college entry to their senior levels; the Hutchins School of Liberal Studies at Sonoma State University is a virtual "school within a school," offering a theme-based, interdisciplinary general education program over four years. In contrast, the two community college LC programs have much in common: team-taught paired courses, integrated coursework, and a significant portion of first-generation college students. Still, Skagit Valley serves a mainly rural population in the northwestern part of Washington and has 5,800 students, while Holyoke has 12,000 students and is an urban institution that serves both small towns and the largest city in western Massachusetts. (See Appendix C for an overview of each of the four LC programs, the number of study participants, and selected student quotations.)

At each of the four campuses, a three-step process for soliciting student feedback was used. Students first took the *Online Survey of Students' Experiences of Learning in Learning Communities*. We then asked students to respond in writing to six items from the online survey most related to integrative learning as described in Table 4.

Table 4
Six Survey Items Included in Qualitative Study

Part I. In my learning community, I:

1. Work on connecting or integrating ideas, strategies, or skills from classes (or disciplines) included in this learning community
2. Reflect on how these connections lead to new insights or understanding
3. Use what I am learning to contribute to another class

Part II. Teachers in my learning community:

4. Demonstrate how to integrate concepts and skills from different classes in a meaningful way
5. Assign work that asks me to connect concepts and skills from different classes to reach new understandings and/or applications

Part IV. In my learning community, compared to other classes, I spend more, less, or about the same amount of time:

6. Integrating ideas, strategies, and skills from multiple sources

The directions provided to students asked: "For each of the survey questions below, provide one or two examples or occurrences in your learning community that came to mind as you were responding to the question." Students did not know beforehand that they were going to do this reflection exercise. After students had completed this second step, faculty members (or a designee) facilitated a discussion with students based on their responses and recorded highlights of this discussion. Both the individually written responses and the discussion highlights were sent to the research team.

Following an initial review of students' written responses, it was clear that we needed to know more about the LC assignments, courses, and course-levels students were referring to as they described their learning experiences. Consequently, telephone interviews between the research team and the participating institutions were conducted to clarify program purpose and student characteristics. The interviews included the following questions:

1. What was the purpose of the LC?
2. Can you tell us a little bit about the LC? Title? Courses? Theme, common issue or question? Student learning outcomes?
3. What credit level was the LC? College-level? Pre-college? Both?
4. Is there anything about your LC students that would help us better understand their responses? Academic preparation? Socio-economic status? English language? Other?
5. Would you share the syllabus and/or integrated assignments with us?

These conversations provided a rich background about the programs and students involved in the qualitative study and helped the research team better understand the context for student responses.

Students' Written Responses to Prompts about Integrative Learning

The original intent of the validation study was to verify that students understood the survey items as the survey designers had intended. At all four campuses, students had specific learning situations in mind when responding to survey items focused on integrative learning. Their written responses map onto the varieties of integrative learning described in *A Statement on Integrative Learning* (2004).

Especially interesting is the emphasis students place on the importance of collaborative learning as a site for integrative learning. In response to the prompt, *In my learning community, I work on connecting or integrating ideas, strategies, or skills from classes (or disciplines)*, almost every student named "working with others on projects." Examples included "developing a study guide for geology together," "creat(ing) a community service project to benefit the community," and "setting up study groups"—all LC assignments. A few students wrote about more specific connections: "ethnicity and economics," which led to new insights about the "economics of racism"; "culture and rituals in anthropology," which helped to make sense of "students' cultural identities"; and, "problem-solving skills," which could be applied to an "engineering class."

For students in this study who navigate the academy with relative ease, as well as those who are more advanced in their studies, the "seminar" is most often named as the site where robust integrative learning occurs. Students' comments include the following insights: "Being able to research and read about a ton of different things, but then bringing it all together is something really special about our program. We challenge, question, and connect ideas all the time"; "I constantly come to new realizations about what we talked about in class/seminar"; "Synthesizing ideas leads to new discoveries. Connecting classes has helped me realize truths about myself and the world around me." And, as one student indicates, integrative learning within a seminar context doesn't require a teacher's oversight: "Our seminars are focused around integrating ideas and strategies and we do it ourselves without the teachers telling us how to pull all the information together as they do in other classes."

In response to whether *I use what I am learning to contribute to another class*, almost all students new to higher education and academic culture wrote about integration as the application of study skills and strategies learned in a student success class to all classes—something students were expected to do. They described using test-taking and reading strategies, communication and writing skills, time management, study group methods, and presentation skills in the context of various general education courses. One student reported, "I really didn't focus on integrating ideas, strategies, and skills because I never thought about it," underscoring the intentionality necessary to make connections from one class to another. For those students in a four-year, interdisciplinary, theme-

oriented program, integration was both horizontal and vertical: "At the end of every lower division course and senior seminar we had to write a summative paper about our experience and tie together many things. After writing these 'intellectual journey' papers I would see how the ideas worked off one another and were reflected in my own life. …In most other classes I rarely synthesized any ideas; only learning cursory knowledge of single topics." Other students referred to specific lower-division classes that they drew on for their senior capstone project.

Despite differences in the "what" of learning, when asked to *reflect on how the examples of connected or integrated learning led to new insights or understanding*, a majority of students described "how" the experience of working together revealed the limits of their own experience and knowledge. As one student in a program designed for students new to college learning noted, "Team work and accepting other people's ideas and thoughts are helpful and important. If I'm going to stick with only my thoughts or ideas, I may not realize my mistakes and/or improve or move forward. This teamwork and accepting others' ideas can contribute to any classes." Another student in the same class wrote: "These connections help us see the perspective of other people and help us discover new things: what's believed now can lead to something new in the future; team work is a need, not an option." A number of similar comments reflected these students' first encounter with what *A Statement on Integrative Learning* (2004) describes as "utilizing diverse and even contradictory points of view."

More seasoned students highlighted the benefits of working together in this way: "You listen to people who think differently from you and use that to build your knowledge and understanding of the world." Another wrote, "The different ideas and viewpoints of other classmates provide for a very diverse conversation that allows for the entire group to realize ideas they would have not otherwise." And a third observed that "respecting and understanding others' point of view helps you learn and think about your own beliefs and even sometimes change them." One student, excited about learning from others, simply noted: "more involved (intellectually)."

While students' responses did not follow a version of the faculty shorthand for designing integrative assignments ("I will integrate ___ with ___ to understand/do ___"), they clearly had examples of integrative learning in mind when they did the online student survey.

New Insights About Collaborative Learning

An unexpected outcome of the qualitative part of the validation study has been the wealth of students' observations about their learning regardless of LC structure. Their accounts mirror curricular approaches associated with LCs "at

their best" as detailed by Smith et al. (2004, pp. 20-21). For instance, students referenced experiential learning and practice, intentional community building, and constructivist classroom experiences. In the latter case, as Smith et al. noted, when LCs are designed as part of an educational reform effort, students' classroom experiences will be very different from those in traditional classrooms, primarily based on shifting assumptions about the nature of knowledge and the consequent implications for teaching and learning.

Simply put, within the LC classroom the *theory* that knowledge is socially constructed is implemented through the *practice* of collaborative learning: the focus is on who is in the classroom (not just the nature of the curriculum), and on the curriculum as a means to encourage connected, relational, and constructed knowing. Smith et al. also observed that, with respect to changing views of knowledge and learning, "learning communities provide a significant arena for putting those theories into practice" (p. 22)—as evidenced, we would add, by the four LC programs in the validation study.

The student writing exemplified how shifts away from traditional approaches to education have been implemented in their LC from the students' perspective. For example, one student described the changes as a result of an active, contextualized learning environment: "I learned how to work with others instead of always working by myself all the time. I learned how to grow outside of me." Another student wrote about the process of constructing knowledge through inquiry (rather than simply acquiring it): "One great thing I've learned…is to question everything. I've learned not just to accept things that are presented to me without questioning it. I now do this with everything in my life, not just in my classes and courses, but in life." Another student described a changed sense of self as a result of the LC experience: "In this class, I have migrated from a generally uninformed green capitalist to a tentative eco-socialist."

Students also wrote about how they used the abilities developed in their LC in other aspects of their education: "I use my math and writing skills for other classes. When my teacher gave us an article about how to learn math and how you can be successful, I thought about how I could use those skills and practice outside of math." Finally, one student illustrated both the process of inquiry and the importance of learning with peers: "I have learned to form opinions and question what I have grown up accepting. Upon entering college there is a moment when you don't know whether to trust your parents' judgment for the rest of your life or make your own choices. Through the seminar process I feel as if I have transitioned through this problem with the support of my peers."

Despite differences in LC programs, students describe their experiences in the classroom and the nature of their learning in some very similar ways. They reference components associated with exemplary classrooms and high-impact

practices: active engagement and reflection, opportunities for integrative learning, and collaborative learning and meaning-making. In students' written responses to the six survey items and even more so in follow-up facilitated discussions, the multiple references made to what students learn from their peers is striking.

As compared to more traditional educational settings, opportunities for students to learn collaboratively from one another are typically part of an LC pedagogical design. However, rarely do LC instructors explicitly assess collaborative learning in ways that help students see how their individual learning adds up to something greater when they collaborate. What do students collectively say about this aspect of their learning experience? And what do they identify as the necessary conditions for establishing a collaborative learning community, where knowledge is shared, developed, and applied as a collective enterprise?

In the Holyoke Community College case study that follows, students delved into the collaborative aspect of their LC learning experience during the facilitated discussions. We turn to highlights from these conversations after briefly introducing Holyoke's LC program, including how it has used the online student survey in its work.

Holyoke Community College Case Study

As one of the eleven colleges to field test the *Online Survey of Students' Experiences of Learning in Learning Communities,* Holyoke Community College (HCC) has continued to administer the online survey every semester to approximately 500 first-year and second-year students enrolled in 25 LC classes. These two-course learning communities feature interdisciplinary subject matter, collaborative learning pedagogy, team teaching, and the collaborative assessment of integrative learning and disciplinary grounding. Like many other institutions, Holyoke's LC program is an alternative to traditional college general education course offerings.

The LC program at HCC uses its survey results to assess whether LC classes are meeting both the program's expected student learning outcomes, such as constructing knowledge using two or more disciplines, and most of the college's general education outcomes. Since HCC first administered the online survey in fall 2009, the LC program has also used survey results to develop a set of evolving professional development practices for teaching teams to strengthen student engagement in LCs and improve student success.

Known for its work on making learning visible in LCs (Mino, 2013), HCC has been using documentation—the practice of observing, recording, interpreting, and sharing the processes and products of teaching and learning through a variety of media—to deepen student learning and improve LC teaching (Given, Kuh, LeeKeenan, Mardell, Redditt & Twombly, 2010). Both this work and the

validation study share a common aim: to make visible "what" students integrate and "how."

For the Holyoke administration of the validation study, 50 students from six different LCs at the first- and second-year levels did the written survey and then participated in discussions facilitated by the LC program coordinator over a one week period. Students' written responses to the six survey items have been clustered into three findings related to integrative learning, connections between classes, and faculty behaviors as indicated previously in Table 4.

In response to items related to *integrative learning*, the majority of students reported learning how to think, read, write, research, and engage in conversations critically, while considering multiple perspectives and using multiple sources, including: ecological, historical, feminist, literary, philosophical-ethical, scientific, social-scientific, and social justice perspectives. "An LC teaches you that there are different perspectives," said one student, who added, "There are different ways to learn, to teach, and to think." Other responses indicated that students were developing critical habits of mind while being exposed to multiple perspectives in LC classrooms. The majority of students also reported learning to "complicate matters" in their attempts to understand the "underlying issues and driving forces" behind events, including: capitalism as a political-economic system and its impact on the environment, women, immigrant groups, and the poor; the social, economic, political, and historical dynamics of oppression; the philosophy and practice of sustainability; and history as connecting the past with the self and the world today. Perhaps more importantly, students recognized the limitations of their current knowledge and perspectives, and reported experiencing a profound shift in their understanding of themselves and their relationship to others and the world around them. For example, many students expressed the feeling that change is possible, that their newly acquired habits of mind require "doing" as well as knowing, and that they can be agents of change in their own communities: "We worked on a social action project which involved a research paper on a subject/topic where we could make a difference. We also had to act on making change...I realized I could make a difference and plan to continue the 'action' part of my project when this class is over."

In response to items related to *connections between classes*, students reported transferring their integrative knowledge and skills to other classes and their personal lives: "I would say I carry what I am learning not only to other classrooms, but everywhere I go. No matter the track, I feel the [LC] class makes you a better person." Students also reported higher levels of motivation, effort, and accomplishment as they integrated their learning in LCs as compared to their other classes. One student wrote:

In my learning community, I actually spend much more time with homework assignments, readings, and projects assigned primarily because the learning approach is stimulating and more thought-provoking. So much so that I want to spend more time on each subject. My personal motivation to succeed is higher. I self impose a higher standard on myself.

In response to items related to *faculty behaviors*, students perceived faculty to be integral to their developing integrative abilities, but it was the collaborative approach to assignments that resulted in deeply integrative learning experiences for almost all students. This shared view is reflected in the following response:

The interdisciplinary approach to learning helps us to reach new understandings and applications because it forces students to think as a member of a community with some sense of belonging that drives our desire to work together and to help each other learn.

Students described a variety of integrative assignments in their LCs, including: application exercises, reading response papers, synthesis papers, reflective journaling, TVEAs (topic, viewpoint, examples, and analysis exercises), an end-of-semester integrative research project and presentation, and service learning projects. Many of these integrative assignments involved out-of-class experiences, such as field trips to local renewable energy sites, a social action project to "make a difference" in their community, a service learning project with a not-for-profit community organization serving teen mothers, a research project on immigration in the city of Holyoke, or integrative science labs conducted off-campus. Students engaged in these experiential learning activities reported deeply integrative learning experiences when learning connects the LC classroom and the community.

Some students did have difficulty understanding the precise differences between the survey questions and often parroted back the questions in the answers, i.e., rephrasing the question in general terms without reporting specific examples or illustrations of the kinds of integrative learning they engaged in. The facilitated discussion, however, produced rich data regarding students' collective perceptions of their integrative learning experiences in LCs. For example, in response to the fourth item of the protocol—"Teachers in my learning community... Demonstrate how to integrate concepts and skills from different classes in a meangful way"—one student from the *Carbon-Free Energy: Fantasy or Future* LC wrote: "Talking about how each of us can make a difference in our lives through the things we've learned." Compare this response to the increase in evidentiary details in the notes from the facilitated discussion:

Along with the usual academic instruction, the professors initiated student involvement in the classroom, field trips, and what the students referred to as peer teaching. The students described their LC class as student-centered and interactive. For example, students presented their final research projects (consisting of a research paper and PowerPoint presentation) on topics as they emerged from the text over the course of the semester. In this way each student became an in-class authority on that topic—able to use relevant texts to interact knowledgeably with teachers and the rest of the class.

The capacity to deepen and extend insights, first written about on one's own and then examined in the company of others during the facilitated discussions, wasn't completely unexpected. Many LC students are experienced in seminaring and thus practiced at what Mercer (2000) describes in *Words and Minds* as "thinking together" or "exploratory talk," one form of collaborative learning:

> …partners engage critically but constructively with each other's ideas. Relevant information is offered for joint consideration. Proposals may be challenged and counter-challenged, but if so reasons are given and alternatives are offered. Agreement is sought as a basis for joint progress. Knowledge is made publicly accountable and reasoning is visible in the talk. (p. 98)

As the LC coordinator met with successive groups of students, it became increasingly clear that exploratory talk, or the *facilitated discussion itself,* promoted the collective construction of knowledge, thus refining, deepening, and transforming students' understanding of their learning experience in LCs. When students engaged in the facilitated discussions, they were more articulate than in their written responses. The facilitated discussions encouraged further elaboration with examples and complicated students' reported experiences by allowing for the "interrogation" of individuals' contributions, i.e., probing, reflecting, and follow-up questioning. In these conversational give-and-takes, a similar practice emerged to that described by a student when talking about their classroom experience: "In LCs we engage, discuss, and build on each others' ideas. LCs challenge me to go beyond. I need to be challenged." This focus on creating collective knowledge added breadth and depth to the learning of individual students as well as the group.

Not to be overlooked or underestimated, students' sense of community seems to be foundational to this exploratory talk as well as all other integrative learning activities in LCs. Mercer and Dawes (2008) elaborate:

In exploratory talk, then, a speaker "thinks aloud," taking the risk that others can hear, and comment on, partly-formed ideas. Engaging in exploratory talk is therefore rather a brave thing to do, and tends not to happen unless there is a degree of trust within a discussion group. (p. 67)

As so often happens in LCs done well, what we were witnessing in the facilitated discussions is the interplay between the growth of collective knowledge and of individual knowledge, with each supporting the other, or, as Bielaczyc and Collins (1999) point out, we were noticing the existence of a community identity that became visible as the discussion progressed: "By working toward common goals and developing a collective awareness of the expertise available among the members of the community, a sense of 'who we are' develops" (p. 275). As one student reminded us: "A learning community is a group of people who share common emotions, values, or beliefs, and are actively engaged in learning together."

In summary, six themes emerged from an analysis of Holyoke students' responses to the validation study's questionnaire, as evidenced by both the written responses and facilitated discussions:

1. Students are learning critical habits of mind in LC classrooms.
2. Students are changing their minds, themselves, and their communities.
3. LC students' new knowledge, developing skills, new perspectives, and emerging sensibilities are being transferred to other classes and their personal lives.
4. Faculty can be powerful models of integrative dispositions, habits, and scholarship.
5. A collaborative approach to integrative assignments results in deeply integrative learning experiences.
6. LC students engage in more integrative learning, receive more encouragement to do so, are motivated to do more work overall, and accomplish more in comparison to their other classes.

The most significant finding to surface from the validation study at HCC was that collaborative learning activities and classroom conversations (either through student-led discussion and/or seminars) promoted the *collective construction of knowledge*, that is, students making meaning together, thus deepening students' understanding of the subject matter, themselves, and the world around them.

At Holyoke, facilitated discussions added a dynamic element to the validation study. The face-to-face exchange with peers turned out to be even more

generative than writing a response to a prompt on one's own; students considered, then collectively built on, the insights of others.

Follow-up phone interviews with colleagues from the other campuses suggested that this part of the validation study might have broader implications for the LC field. Our research team grew to appreciate that students' reflective writing about integrative learning, in tandem with a facilitated discussion, created opportunities for collective reflective inquiry not only at Holyoke, but at the other campuses as well, especially in relation to collaborative learning. With this in mind, we wondered whether the collaborative dimension of LC learning could be more easily surfaced if we designed a protocol to organize collective reflective inquiry for the LC field's use.

A New Companion Tool to the Online Student Survey

From the perspective of protocol design, what could we learn from students who participated in the validation study? Re-reading the stack of student responses revealed a pattern that we used to develop the *Peer-to-Peer Reflection Protocol*.

Using an initial selection of online survey questions that focused on integrative learning, the written part of the validation study invited students to think about their experiences of learning in LCs through a particular lens—and they did. However, two of the six prompts generated the most thoughtful and prolific writing on the part of over 200 students from all four schools:

In my learning community, I:
1. Work on connecting or integrating ideas, strategies, or skills from classes (or disciplines) included in this learning community.
2. Reflect on how these connections lead to new insights or understanding.

Taking a cue from students' written narratives, we based the first step of the two-step *Peer-to-Peer Reflection Protocol* on the above two prompts (see Appendix A). This first part of the protocol—referred to as the "post-survey written reflection exercise"—still asks students to provide one or two examples or occurrences that came to mind when they answered this part of the online survey.

The second part of the protocol, the "facilitated discussion," uses the format of a structured conversation. Its purpose is explicit: "to provide an opportunity for students to develop a collective understanding of their learning community experience by considering both the individual and collaborative nature of learning in LC classrooms." This facilitated discussion has three steps. In the first, *Introducing the Process*, the facilitator reviews the facilitator role and each step in the reflective discussion. In the second, *Discussion Agenda*, facilitation for each point is briefly detailed: (1) listening round; (2) making connections; (3)

wondering; and (4) uncovering complexity. In the last step, *Appreciating Students' Contributions to the LC Campus Program*, students are thanked for sharing their insights with classmates and for their contributions to improving the LC program on campus.

The discussion agenda in the second part of the protocol is grounded in a different "reading" of students' written responses than that done for the validation study. For instance, when students' responses from all four schools are read in one sitting, it is evident that despite the particularities of students' experiences and comments, they are clearly part of a specific learning community. Each response, while unique, "fits" within a larger set of responses informed by common learning touchstones. The student who wrote, "I feel more patient with life," did so after commenting on the self-discipline learned through LC project work; another, referring to "the gift" of getting a job at a writing center, acknowledged that "when you keep practicing writing, you inevitably get better at it," a reference to a writing-intensive LC. This interplay between the individual and community struck us as a critical entry point: everyone needs to hear the uniqueness of each classmate's learning experience before noting connections or common themes. Hence, in the facilitated discussion, a "listening round" begins the conversation, followed by "making connections."

The next step of the discussion agenda—"wondering"—recognizes that some students' accounts of learning leave us wanting to know more: "I learned to understand that what I believe now will, and can change in the future. I can accept that at times others may influence my beliefs." Other students' responses touch on aspects of their learning experience that are less visible and present opportunities for "uncovering complexity"—the last discussion agenda point. For instance, one student cited a specific author to illustrate how integrating ideas led to new insights: "David Suzuki's argument about [the] human tendency to become so micro-focused on [the] smallest details, rather than [the] full picture, opened my mind up way beyond [the] confines of one subject and one idea." Then, after describing a series of connections generated by the Suzuki insight, the student concluded: "Although not all the connections are immediate, when they come to me they stick, until a new idea or piece of information comes to me and the process happens again." This student's account opens the door to a collaborative examination of the moves involved in developing integrative habits of mind and the nature of this activity: Is the activity solitary and/or collaborative? Is it dependent on each student as meaning maker and/or part of a community's negotiated understanding?

If we are to arrive at "uncovering complexity," the conversation with students needs to be both exploratory and intentional. In this regard, we applied a lesson from Washington Center's national assessment project: use a protocol to structure a conversation. Along with our campus co-researchers for that project,

we discovered that the Collaborative Assessment Protocol, introduced by Boix-Mansilla, kept our collective attention focused on evidence of disciplinary grounding and integration in students' writing. Without the protocol, we wandered off into interesting yet ultimately less productive conversations, given the national project's aims.

The structure of the *Peer-to-Peer Reflection Protocol* focuses on the individual and collaborative nature of learning in LCs. Like any newly-minted tool, it needs to be field-tested. We invite LC programs to use it as a companion tool to the online student survey or, with obvious modifications, to use it as a stand-alone assessment tool. Through its use—and refinement of its prompts over time—we hope that, as a field, we will discover more about students' individual and collective experiences of collaborative learning.

Conclusion: The Missing Piece in LC Assessment

The mixed-methods validation study of Washington Center's *Online Survey of Students' Learning in Learning Communities* began as a "good housekeeping" endeavor: How valid are the online survey's findings? It turns out that it meets all the requirements of a standard validation study and that students do have examples of integrative learning in mind when they respond to survey prompts. But, as we moved into the qualitative part of our research study, we were struck by an anomaly: while LCs are associated with *collaborative learning*, LC assessment of student learning, in keeping with assessment practices in general, elicits *individual* not *collective* responses. The online student survey is no exception.

We wouldn't have noticed this curious phenomenon—and its implications for LC practice—if we had simply stopped the study after collecting and analyzing individual students' written responses to online survey prompts. But, when these responses became the basis for facilitated discussions at four very different LC programs, the constructivist collaborative dimension of LCs became more visible in the context of students' "thinking together" and their "exploratory talk" (Mercer, 2000). Similar to how collaborative learning is portrayed in the LC literature, students referred to instances associated with peer-group learning (most examples) and to the social construction of knowledge as a negotiated consensus among knowledgeable peers (far fewer examples).

Still, as one colleague has pointed out, there are inherent complexities in trying to measure and assess constructs like "collaborative learning." What counts as "evidence" of collaborative learning will differ based on LC practitioners' understanding of this longstanding and much emphasized feature of educational innovation and LC practice (see Goodsell, Maher, & Tinto, 1992).

In *What is Collaborative Learning*? (1992), Barbara Leigh Smith and Jean MacGregor introduced collaborative learning as a counterpoint to the fragmented and routinized character of undergraduate education; collaborative learning was characterized as a means to revitalize teaching and learning through social and intellectual engagement and mutual responsibility. They defined collaborative learning as "an umbrella term for a variety of educational approaches involving joint intellectual effort by students or by students and teachers together. In most collaborative learning situations, students work in groups of two or more, mutually searching for understandings, solutions, or meanings shared by theorists, or creating a product" (p.10). Smith and MacGregor's account included a series of assumptions about learning from its active and constructive nature to its richly contextualized nature, from the value of diversity in a student body to learning's affective and subjective dimensions. Their account also summarized collaborative learning approaches from cooperative learning to problem-centered instruction, peer teaching, discussion groups and seminars, and learning communities—the latter regarded as the most promising place to practice collaborative learning because a learning community "intentionally reconfigures the curriculum" (p.18).

Today few contemporary LC classrooms follow the model of year-long interdisciplinary coordinated studies. And a younger generation of LC practitioners may be less knowledgeable about the debates of the mid-1990s that made LCs less an intervention strategy for student success and more a strategy for educational reform and institutional change.

In the field today, collaborative learning is typically embraced as a series of classroom practices equated with group work and strategies for encouraging active engagement in the learning process rather than as a way to destabilize the authoritative voice of the teacher through the deliberate "social construction of knowledge." In contrast, the more radical rendition of collaborative learning not only moves the sage off the stage but also draws on fundamentally different assumptions about the nature of knowledge compared to traditional higher education practice. Bruffee (1993), for instance, has far more in mind than pedagogical strategies: "Collaborative learning assumes…that knowledge is a consensus among members of a community of knowledgeable peers—something people construct by talking together and reaching agreement" (p.3).

In his discussion, Bruffee references Thomas Kuhn's account of knowledge in *The Structure of Scientific Revolutions* (1962), noting that it is "intrinsically the common property of a group or else nothing at all." He wanted educators to think about college and university education as a "process of cultural change" and themselves as "agents of cultural change." He writes: "to serve effectively as agents of cultural change, teachers have to organize students to learn collaboratively." Traces of this version of collaborative learning surfaced in the qualitative portion of the validation study; less radical notions surfaced in the

quantitative portion of the validation study (see Appendix B, "Student behaviors that support collaborative learning") and were detailed through written responses and during facilitated discussions.

Certainly, current items in the online student survey that reference collaborative learning provide useful data for LC programs and teaching teams. And, as a consequence of the validation study findings, we have thought about adding a new section: "Students in my learning community…" with a range of choices that reflect what we learned from students' experiences of collaborative learning during the validation study. We may still do this.

But we think that field testing the *Peer-to-Peer Reflection Protocol* will yield quite different results: for students it is an opportunity to explore the social and constructivist nature of learning and knowledge in one another's company; for LC programs and teaching teams it is an opportunity to appreciate the deep and intricate connections between LCs done well and transformative learning. In particular, though, we hope that the field's use of this simple to administer *Peer-to-Peer Reflection Protocol* will encourage scholarship on the collaborative dimension of learning in contemporary LCs as experienced and theorized by students and educational reformers alike.

References

Association of American Colleges & Universities. (2007). *College learning for the new global century*. Washington, D.C. Retrieved from http://aacu.org/leap/documents/GlobalCentury_final.pdf

Association of American Colleges & Universities and the Carnegie Foundation for the Advancement of Teaching. (2004, March). *A statement on integrative learning*. Retrieved from http://www.evergreen.edu/washingtoncenter/intlearning/intlearningresources.html

Bielaczyc, K., & Collins, A. (1999). Learning communities in classrooms: A reconceptualization of educational practice. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theories* (Vol. II, pp. 269-292). Mahwah, NJ: Lawrence Erlbaum Associates.

Boix-Mansilla, V. (January/February 2005). Assessing student work at disciplinary crossroads. *Change: The Magazine of Higher Learning, 37*(1), 14-21.

Boix-Mansilla, V. *(December 2008/January 2009).* Productive shifts: Faculty growth through collaborative assessment of student interdisciplinary work. *Journal of Learning Communities Research, 3*(3)*,* 21-26*.*

Boix-Mansilla, V. & Dawes Duraising, E. (2007). Toward a framework for assessing students' interdisciplinary work: An empirically grounded framework proposed. *The Journal of Higher Education, 78*(2), 215-237.

Boix-Mansilla, V. & Gardner, H. (2003). *Assessing interdisciplinary work at the frontier: An empirical exploration of "symptoms of quality."* Cambridge, MA: Harvard Graduate School of Education, Project Zero.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.

Brownell, J. & Swaner, L. (Spring 2009). High-impact practices: Applying the learning outcomes literature to the development of successful campus programs. *Peer Review*, *11*(2), 26-30.

Bruffee, K. (1998). *Collaborative learning: Higher education, interdependence, and the authority of knowledge* (2nd ed.). Baltimore, MD: Johns Hopkins University Press.

Burg, E., Klages, M. & Sokolski, P. Beyond "parallel play": Creating a realistic model of integrative learning with community college freshmen. *Journal of Learning Communities Research, 3*(3), 21-26.

Dunlap, L. & Sult, L. *(December 2008/January 2009).* Juggling and the art of the integrative assignment**. *Journal of Learning Communities Research, 3*(3), 63-75.

Given, H., Kuh, L., LeeKeenan, D., Mardell, B., Redditt, S. & Twombly, S. (2010). Changing school culture: Using documentation to support collaborative inquiry. *Theory Into Practice*, *49*, 36-46.

Goodsell, A., Maher, M. & Tinto, V. (1992). *Collaborative learning: A sourcebook for higher education*. University Park, PA: National Center on Postsecondary Teaching, Learning, and Assessment.

Huber, M., Hutchings, P., & Gale, R. (Summer/Fall 2005). Integrative learning for liberal education. *Peer Review, 7*(4), 4-7.

Kuh, G. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter.* Washington, DC: Association of American Colleges and Universities. Retrieved from http://www.neasc.org/downloads/aacu_high_impact_2008_final.pdf

Kuhn, T. (1962). *The structure of scientific revolutions.* Chicago, IL: University of Chicago Press.

Lardner, E. & Malnarich, G. (Dec. 2008/Jan. 2009). Assessing integrative learning: Insights from the national project on assessing learning in learning communities**. *Journal of Learning Communities Research, 3*(3), 1-20.

Lardner, E. & Malnarich, G. (September/October 2009). When faculty assess integrative learning: Faculty inquiry to improve learning community practice. *Change: The Magazine of Higher Learning, 41*(5), 28-35.

Mino, J. (2013). Link aloud: Making interdisciplinary learning visible and audible. *Learning Communities Research and Practice*, *1*(1). Retrieved from http://washingtoncenter.evergreen.edu/lcrpjournal/vol1/iss1/4

Mercer, N. (2000) *Words and minds: How we use language to think together.* London: Routledge.

Mercer, N. & Dawes, L. (2008). The value of exploratory talk. In N. Mercer & S. Hodgkinson, (Eds.), *Exploring talk in school.* London: Sage.

Pettitt, M. & Muga, D. Templates and rubrics: Connecting outcomes, assignments, and assessment in interdisciplinary learning communities. *Journal of Learning Communities Research, 3*(3), 109-126.

Smith, B., MacGregor, J., Matthews, R. & Gabelnick, F. (2004). *Learning communities: Reforming undergraduate education*. San Francisco, CA: Jossey-Bass.

Smith, B. & MacGregor, J. (1992). What is collaborative learning*?* In A. Goodsell, M. Maher, & V. Tinto, *Collaborative learning: A sourcebook for higher education*, (pp. 9-22). University Park, PA: National Center on Postsecondary Teaching, Learning, and Assessment.

Tinto, V. (2003). Learning better together: The impact of learning communities on student success. *Higher Education Monograph Series*, *1*(8).

Appendix A: Peer-to-Peer Reflection Protocol

This peer-to-peer reflection protocol is a companion tool to the *Survey of Students' Experiences of Learning in Learning Communities*. Its aim is to provide LC Programs with a method which invites students—in the company of peers—to further explore their experiences and perceptions of integrative learning as well as collaborative learning.

Designed to be used *after* students do the online survey, the protocol builds on individuals' anonymous survey responses. It has two distinct and related parts. The first is a written reflection exercise based on a section from the online survey which focuses on integrative learning. The second uses what students' write as a starting-point for a facilitated, exploratory conversation where the intent is to deepen students' *collective understanding* of their learning community experience.

Peer-to-Peer Reflection Protocol (PRP) for Exploring Students' LC Learning Experiences

Part I – Post-Survey Written Reflection Exercise
1. Once the online survey has been administered, distribute the handout in the box below which asks each student to provide examples or situations which support their rating of two questions from the survey most related to integrative learning. *This post-survey written reflection exercise can be done in the same class or in a time-frame which suits the LC Program. You will want to add additional spacing after each prompt; the handout should be around one and a half to two pages in length.*

Directions: For each of the survey questions below, provide one or two examples or occurrences in your learning community that came to mind as you were responding to the question.

In my learning community, I:

    a. *Work on connecting or integrating ideas, strategies, or skills from classes (or disciplines) included in this learning community*
    b. *Reflect on how these connections lead to new insights or understanding*

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2. After all students have had a chance to write responses, facilitate a discussion with students based on their responses and insights (see page 2). This can be done in the same class or in a time-frame which suits the LC program. *We recommend that facilitation be done by a member of the teaching team or someone knowledgeable about the LC class.*

3. You may want to note down or record highlights of the discussion for future in-class use and/or professional development conversations.

Part II – Facilitated Discussion

The purpose of this part of the protocol is to provide an opportunity for students to develop a collective understanding of their learning community experience by considering both the individual and collaborative nature of learning in LC classrooms.

1. Introducing the process

The facilitator reviews the role of the facilitator, i.e. to make sure the conversation stays focused on each step in the reflective discussion: 1) listening round; 2) making connections; 3) wondering; and 4) uncovering complexity.

2. Discussion agenda

Listening round: One by one, without interruption, students share examples or situations from their written responses in a round robin fashion.

Making connections: Once everyone has shared their responses, the facilitator asks students to point out any connections or common themes given the range of experiences and situations.

Wondering: Students are invited to raise questions or name anything they are curious about in relation to the kind of learning their fellow students are describing.

Uncovering complexity: The facilitator invites everyone present to share any thoughts they have about "what lies beneath the surface" [1] of their experience.

3. Appreciating students' contributions to the LC Campus Program

The facilitator thanks students for sharing their insights with classmates and their contributions to improving the LC program on campus.

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[1] This expression is from Cultures of Thinking, Harvard Project Zero: http://www.ronritchhart.com/COT_Resources.html.

Appendix B: Summary of Items and Factor Loadings[1]

Loading	Factor Name and Items
Faculty behaviors that support quality learning for all students	
.729	Encourage me to explore my ideas
.719	Encourage students to ask questions in class
.714	Encourage students to discuss assigned work in class
.705	Make all students feel comfortable about participating in class activities
.704	Talk to me about my ideas
.674	Help me use my background knowledge and life experiences to learn new things
.672	Demonstrate how to integrate concepts and skills from different classes in a meaningful way
.667	Help students establish productive working groups
.659	Show me how to evaluate the strengths and weaknesses in my work as a basis for improvement
.635	Make the goals and vocabulary of learning communities clear
.606	Assign work that asks me to connect concepts and skills from different classes to reach new understanding and/or applications
.578	Encourage me to seek out other resources on campus (library, math center, writing center, learning center, student services, financial aid, etc.)
.539	Encourage me to plan the next steps in my education with a counselor or advisor
Student behaviors that foster responsibility for their own learning	
.755	Take responsibility for my own learning
.734	Be successful in future courses and programs
.730	Persist when faced with academically challenging work
.682	Identify the learning strategies that are most effective for me
.624	Connect my learning in school to problems and issues in my local community and the world
.525	Work effectively with others to complete assignments/projects
Student behaviors that support collaborative learning	
.784	Work with other students on group projects during class
.708	Peer review my and other students' work during class
.634	Work with other students to examine complex issues during class
.609	Present my work, or work done as part of a group, to the class
.533	Work on reading, writing and/or problem-solving assignments during class

	Student and faculty behaviors that create an academic learning community
.726	Participate in class discussions or seminars
.704	Ask questions in class
.582	Reflect on how these connections lead to new insights or understandings
.545	Work on connecting or integrating ideas, strategies, or skills from classes (or disciplines) included in this learning community
.488	Discuss ideas from this learning community with family members, co-workers, or other students, etc.
.435	Use what I am learning to contribute to another class

[1]Method: Thirty-two (32) survey items selected. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in seven iterations.

Appendix C: Overview of Qualitative Validation Study Institutions

California State University, Sacramento (CA)

The California State University *(CSU) Educational Opportunity Program* (EOP), established in 1969, is designed to increase the access, academic success, and retention of educationally and economically disadvantaged students. CSU Sacramento's EOP offers transitional student support through a 5-week summer bridge, a fall LC, a spring LC focused on career success, and an ARISE Project for sophomore through senior level scholars. Other programs provide additional academic and social support such as the College Assistance Migrant Program (CAMP) for students from migrant and seasonal farm worker backgrounds.

Study Participants: 142 students from three different LCs.

Notable Student Quotes:
- *These connections lead me to feel more comfortable when talking in front of the class. It also helps me understand different aspects of really common things. I kind of saw these things from different perspectives.*
- *I understand what college is all about, and how the system works. I became more and more independent on how to study for test.*
- *I learned how to work with each other instead of always working by myself all the time. I learned how to grow outside of me. By doing/using team work, and learning how to communicate with others because I'm usually a quiet and shy person who just listen and don't talk at all.*

Holyoke Community College (MA)

For two decades Holyoke Community College (HCC) has offered two-course interdisciplinary LCs featuring interdisciplinary subject matter, collaborative learning pedagogy, team-teaching, and integrated assessment. HCC offers 25 LCs each year to approximately 500 first-year and second-year students as an alternative to traditional college general education course offerings.

Study Participants: 50 students from six LCs at the first and second year levels.

Notable Student Quotes:
- *A learning community is a group of people who share common emotions, values, or beliefs, and are actively engaged in learning together.*
- *I would say I carry what I am learning not only to other classrooms, but everywhere I go. No matter the track, I feel the [LC] class makes you a better person.*
- *In this class, I have migrated from a generally uninformed green capitalist to a tentative eco- socialist.*

Skagit Valley College (WA)

Skagit has been offering curricular learning communities since 1986. Students' participation in LCs has been a requirement for the transfer degree since 1993. Most college-level LCs are paired, fully-integrated, team-taught courses with both faculty in the classroom at all times. Classes in developmental LCs are typically offered back-to-back, with overlapping integrative assignments.

Study Participants: 7 students from a developmental math and reading LC pair.

Notable Student Quotes:

- *I use my math and writing skills for other classes. When my teacher gave us an article about how to learn math and how you can be successful, and I thought about how I could use those skills and practice outside of math.*
- *Story problems seemed to be everyone's nightmare so it was great doing a group project and also having to write out our steps.*
- *Group project when teachers were both gone.*

Sonoma State University (CA)

Established in 1969, the interdisciplinary, theme-oriented *Hutchins School of Liberal Studies* offers lower division students an alternative general education program, and upper division students a major in Liberal Studies leading to a Bachelor of Arts (BA) degree. Hutchins also offers a minor in Integrative Studies, a 4-year blended program leading to a BA, and a Multiple Subject Teaching Credential. Seminars are a key feature of all Hutchins programs.

Study Participants: 46 students at various levels in their Hutchins studies.

Notable Student Quotes:

- *All of our final projects, papers, etc. contain some element of extending/expanding on a topic. Often times you can synthesize other course material with Hutchins assignments, owing to the freedom within the assignment. If you cannot synthesize your education, perhaps you missed out on your higher education.*
- *I have learned to form opinions and question what I have grown up accepting. Upon entering college there is a moment when you don't know whether to trust your parents' judgment for the rest of your life or make your own choices. Through the seminar process I feel as if I have transitioned through this problem with the support of my peers.*
- *One great thing I've learned in Hutchins is to question everything. I've learned not just to accept things that are presented to me without questioning it. I now do this with everything in my life, not just in my classes and courses, but in life.*