III

Assessment's Role in Transforming
a Grass-Roots Initiative
into an Institutionalized Program:
Evaluating and Shaping Learning
Communities at Iowa State University

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Mary E. Huba, Shari Ellertson, Michelle D. Cook, and Douglas L. Epperson

Iowa State University (ISU) was founded in 1869 after Iowa became the first state to accept the terms of the 1862 Morrill Land Grant Act. Iowa State is a doctoral-extensive, public research university with more than 23,000 undergraduates and a total student body of nearly 28,000. Located in Ames, Iowa, the university offers bachelor's degrees in 100 areas, one professional degree (veterinary medicine), and more than 100 majors for graduate degrees.

Learning community planning began as a grass-roots effort in 1994, and the first learning communities were implemented in the 1995–96 academic year. Since then, learning communities have experienced substantial growth, sparked by a three-year internal grant program started in 1998. Learning communities on campus are varied. They can be categorized as course-based, residential, or both course-based and residential, with approximately one-third of all programs including a residential component. In nearly every case, students self-select into the learning communities. Additional information about learning communities at ISU can be accessed at www.iastate.edu/~learncommunity.

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> **Examples of Learning Communities at ISU**
>
> **Cross-Cultural Learning Community**
> - Residential and course-based learning community for twenty students: ten from the United States and ten international or U.S. students whose first language is not English.
> - The purpose is twofold: (1) increased understanding and appreciation of human diversity and (2) preparation for a global career.
> - Students take Music 102–Introduction to Music Listening (3 credits), Liberal Arts and Sciences 130–Cross-Cultural Learning Community Seminar (1 credit), and University Studies 150–Dialogues on Diversity (1 credit).
>
> **Health and Human Performance (HHP)**
> - Two separate course-based learning communities, one for freshmen and the other for transfer students in the department.
> - The purpose is to help students make a successful transition to college, establish a support network for learning, teach strategies for academic success, and assist in career exploration through field trips, speakers, and careful course selection.
> - First-year students take Health Studies (or Exercise Science) 250–Health and Human Performance Orientation (1 credit), Zoology 155–Anatomy and Physiology Lecture (3 credits) and Sociology 134–Introduction to Sociology (3 credits).
> - Transfer students take the one-credit orientation course and have separate learning community meetings.
>
> **Biological Education Success Teams (B.E.S.T.)**
> - Residential and course-based learning community for students of the biological sciences, with a service-learning component.
> - The purpose is to facilitate acclimation to the biological sciences while promoting social and academic integration.
> - Students take the following courses together: English 104, 105, or 105H–First-Year Composition (3 credits), Math 181–Calculus and Differential Equations for the Life Sciences (4 credits), Biology 102–Opportunities in Biology (.5 credits), Biology 201–Principles of Biology 1 (3 credits) with Laboratory (1 credit), Chemistry 177–General Chemistry (4 credits) with Laboratory (1 credit).

In the late 1990s, Iowa State University (ISU) began an ambitious and extensive learning community program, focused primarily on first-year students. The university president provided a three-year internal grant of $1.5 million to fund the project with the expectation that program effectiveness would be assessed.

The assessment effort developed with broad participation from many constituencies. ISU is fortunate to have two graduate programs, Higher Education and Psychology, in which both faculty members and graduate students are interested in studying the learning community reform effort. In addition, other faculty and staff from around the university are committed to assessment. When a partnership among these individuals was formed, assessment took shape as a scholarly university-wide collaboration, and the team effort deepened and strengthened the work. In order to assure credibility for assessment within the culture of a research university, the assessment team designed evaluation studies to be as rigorous and methodologically sound as possible, especially because they could not use an experimental approach with random assignment to groups.

In this chapter, we will describe the learning community initiative at Iowa State, paying particular attention to the role of assessment in evaluating and shaping its development. We will begin by describing what we mean by the term "learning community" at ISU, and we will discuss how learning communities began and evolved on campus. In the area of learning community assessment, we will describe goals, achievements, and challenges. We will conclude by discussing the ways in which we anticipate our assessment program changing over time.

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Characteristics of Learning Communities at Iowa State University

Learning communities at ISU are varied and unique, developing from specific student needs and the interests and creativity of faculty and staff in our many colleges and departments. Their variety reflects the grass-roots origin of our learning community program and the decentralized culture of the university. At ISU, there is no core curriculum. General education requirements in four broad areas (communication, natural sciences/math, social sciences, and humanities) are determined by the colleges and departments. The only common requirements for all undergraduates are first-year composition, a library skills course, and six credits in the area of diversity and internationalization.

Learning communities are categorized as course-based, residential, or course-based residential. In course-based programs, students enroll in the same sections of two or three common courses with an English composition course as a frequent element. In some of the course-based communities, participating faculty members link courses by integrating their curricula and using their joint time flexibly. Communities with a residential component provide students the opportunity to live together or near each other in the residence halls. Approximately one-third of the learning communities at ISU include a residential component.

Most communities focus on first-year students, but some sophomore and upper-level communities have been developed. In nearly every case, students self-select into the learning community. Characteristic components of many learning communities are service-learning, social activities, study groups, and field trips. In addition, peer mentors are key elements of many learning communities at ISU. In 2002–03, 133 undergraduates served in the peer mentor role.

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Each learning community has a formal "learning community coordinator," a faculty or staff member who serves as a liaison to the overall learning community initiative as well as a contact person for current and prospective learning community students. A coordinator's responsibilities may also include securing learning community courses and teachers, promoting the learning community, recruiting students, writing funding proposals and annual reports, managing individual learning community assessment, facilitating communication among learning community teachers, supervising undergraduate peer mentors, determining goals and long-range plans for the learning community, developing and teaching courses or seminars in the learning community, and overseeing day-to-day details of the learning community.

About one-third of learning communities (fifteen out of forty-six in 2002–03) are large enough to have separate units (or subdivisions) within them called teams. For example, the College of Business is considered to have one learning community, but each of the 120 participating students belongs to one of the college's twelve learning teams. From the student's viewpoint, the learning team is the learning community. In fall 2002, there were 119 teams within the forty-six learning communities at ISU.

The Development of Learning Communities at ISU
The University Backdrop for Learning Community Development

Learning communities began at ISU in the 1990s, a decade in which the university experienced an expanded campus-wide emphasis on improving teaching and learning. One indication of the increased emphasis on teaching and learning was the emergence of two faculty development initiatives in the early 1990s. The first was the Center for Teaching Excellence, created on campus to provide faculty and administrators with information about innovative instructional techniques and research about effective teaching. The Center offers educational opportunities such as seminars, workshops, consultations, and grants in order to improve the instructional environment. Its current mission is to promote learning and the scholarship of teaching on campus (Iowa State University Center for Teaching Excellence 2001).

The second faculty development program, Project LEA/RN (Learning Enhancement Action/Resource Network), was developed as a grass-roots effort by faculty in the Colleges of Education and Engineering. Project LEA/RN organizes faculty in small groups to reflect on teaching, learning, and modifying their practice in the classroom (Licklider, et al. 1997).

Another indication of an expanded teaching-learning emphasis at ISU in the 1990s was the development of student outcomes assessment. This learning-related initiative began in earnest at Iowa State in 1994 when all academic programs were required to develop and implement outcomes assessment plans. In the same year, the assessment of student learning received campus-wide visibility and coordination with the creation of a Student Outcomes Assessment Coordinator and Committee.

Three additional important events in the late 1990s provided further evidence of ISU's increased emphasis on teaching and learning. One was the development and approval of a new promotion and tenure policy that emphasized the importance

of the scholarship of teaching (Iowa State University 1999). The second was the creation of the position of Vice Provost for Undergraduate Programs to, in part, provide leadership for learning-related initiatives on campus. The third was the approval of a new five-year university strategic plan at the end of the decade (Iowa State University 2000). The plan was developed to guide the university from 2000 to 2005, and it highlighted the importance of enhanced learning on campus rather than improved teaching.

Initial Learning Communities

In this environment, the learning community initiative began as a grass-roots effort**.** An early pioneer in the initiative was the Department of Residence. According to Doug Gruenewald, Assistant Director of Residence for Academic Services, the Department of Residence became interested in learning communities as a way to support students academically.

> My department became interested in increasing our support for the academic mission of the university in the early 90s. We felt we were doing a great job supporting students socially, personally, and developmentally, but we weren't doing enough to support them academically. We became aware of Freshman Interest Group (FIG) programs at other institutions, and we started investigating ways we could develop something similar. We also tried to develop an "academic culture" in all the residence halls. This involved an increased focus on academic programming and a change in how we recruited, organized, and trained staff. (Personal communication, February 6, 2002)

At the same time, some academic programs (biology, business) and academic initiatives (the Honors Program, Women in Science and Engineering) were independently exploring the benefits of including a residential component in their programming. When communication between these programs and Department of Residence staff began, the concept of learning communities took form. In 1995-96, the first residential learning communities began when all of these programs incorporated a living component into their activities.

Another learning community that evolved in the residence halls was "The Design Exchange," a program that began in 1997 to improve the first-year experience for new students in the College of Design. According to Mark Chidister, former "Design Exchange" coordinator and associate dean of the college,

> The three main factors that led to the creation of "The Design Exchange" were disturbing one-year persistence rates, a strong sense that we could improve the freshman experience for new design students, and Doug Gruenewald's visit from the Department of Residence to explore possibilities for collaboration. We were concerned that, by the beginning of the second year, about half of the students who started in the college had transferred elsewhere on campus or had left the university. (Personal communication, January 31, 2002)

As initiatives such as the Design Exchange gained in popularity across campus, the learning community initiative grew rapidly. As Table 1 shows, both the number of learning communities and the number of participating students almost doubled between 1998 and 2001.

The systematic expansion of learning community efforts began in January 1998 when thirteen individuals representing student affairs, academic affairs, and each of the seven undergraduate colleges attended a national learning communities conference. At the conference, they took advantage of the opportunity to plan for the future, and their discussions led to the subsequent formation of a Learning Communities Working Group on campus.

Table 1
Number of Learning Communities and Participants by Year

	Year				
Group	1998	1999	2000	2001	2002
Learning Communities [1]	23	36	38	47	46
Participants [2]	1,114	1,780	1,838	2,103	2,139

1. In many large learning communities, students meet in smaller groups called learning teams. For example, in 2002, fifteen of the forty-six learning communities were divided into learning teams.
2. This number includes all students, not just first-time, full-time freshmen, who participated in a learning community for fall semester.

Throughout the 1998 spring semester, the Working Group utilized funds allocated from the provost's office to conduct site visits, sponsor a learning community workshop, develop a publication for use at orientation, and promote assessment and writing-across-the-curriculum efforts. The group also held a two-day Working Group retreat, resulting in a white paper that outlined the vision, objectives, outcomes, and needs for learning communities at Iowa State. The university president, Martin Jischke, further stimulated learning community expansion in the summer of 1998 when he responded to this document by allocating $1.5 million to the learning community initiative over a three-year period. The intent was to develop pilot programs, assess their impact, and formulate plans for the future.

At this point, an administrative team was established to oversee the learning community program. The team consisted of the Vice Provost for Undergraduate Programs, the Vice President for Student Affairs, the director of the Center for Teaching Excellence, and the Assistant Director of Residence for Academic Services. These individuals established an administrative infrastructure to coordinate and nurture the expanding network of grass-roots communities.

The Learning Community Infrastructure

The learning community infrastructure developed by the administrative team consisted of several elements: a committee structure, graduate student staffing, an annual institute, and a process for awarding funds to individual learning communities. Although it has developed over time, this basic infrastructure has

continued to the present day. Annual modifications have brought about greater focus and efficiency as well as more complete staffing of both committees and graduate student positions. We will describe the components of our infrastructure as they exist at the present time.

Figure 1. Infrastructure of Learning Communities at Iowa State University
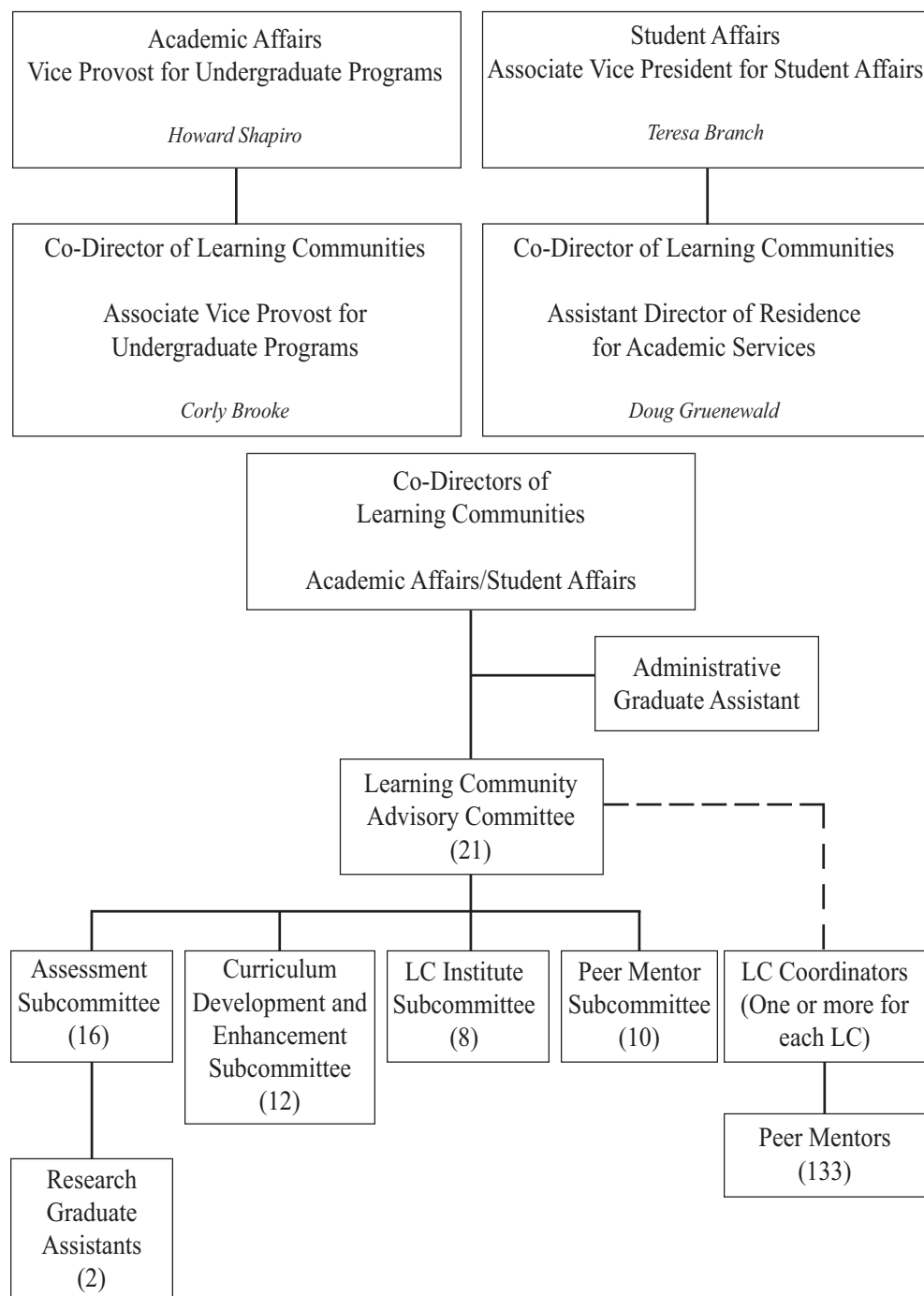
Committee Structure

Corly Brooke, Director of the Center for Teaching Excellence, and Doug Gruenewald, Assistant Director of Residence for Academic Services, have chaired the Learning Community Advisory Committee from its inception. This twenty-one-member committee is currently a broad-based volunteer group of administrators, faculty, student affairs staff, and graduate students who provide leadership and support for new and existing learning communities. Committee members and additional faculty and staff serve on four active subcommittees to address the following issues: assessment (n = 16), training and development of peer mentors (n = 10), curriculum development and enhancement (n = 12), and preparation for an annual on-campus institute (n = 8). All told, at the present time, nearly fifty individuals per year support the learning community initiative through their involvement in the subcommittees. With its involvement of faculty, staff, graduate students, and undergraduate students, the committee structure reflects the collaborative nature of our learning community initiative itself.

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Graduate Student Staff

Two doctoral students in the Department of Educational Leadership and Policy Studies, as well as a master's student from the Department of Statistics, are currently employed to assist with learning community administration and assessment. One graduate assistant participates in all four subcommittees, assists with organizational tasks, and serves as a liaison among the administrative team, the Learning Community Advisory Committee, and the subcommittees. The other two graduate assistants collaborate with the co-chairs of the Assessment Subcommittee in carrying out the subcommittee's tasks.

Annual Institute

Another key element of ISU's learning community effort is the Learning Communities Institute, an annual, two-day, on-campus conference held immediately after the spring semester concludes in May. More than 150 faculty and staff members, administrative leaders, and graduate students gather to share success stories, reflect on the campus's learning community efforts, attend presentations and discussions, and plan for the future of learning communities, both individually and collectively. Each institute includes nationally recognized experts and leaders as keynote speakers.

Disbursement of Funds

A substantial portion of the original funds allocated by the university president for learning community development was disbursed to individual communities. An annual competitive process for proposal review was developed, and this process continues today. Each November, interested learning community coordinators submit proposals to fund initiatives for the following academic year. The entire university community is eligible and encouraged to submit proposals. Annual reports are required of learning communities that receive funding. Each report summarizes a learning community's activities, including assessment.

Formalization of Learning Communities

By the end of the initial three-year funding period, our learning community assessment program, which will be discussed below, was able to demonstrate enhanced university retention for participating students. As a result, permanent funding for learning communities was established in summer 2001. At that time, the grass-roots learning community initiative entered the formal university structure with the creation of the position of Associate Vice Provost for Undergraduate Programs. The person filling this position, Corly Brooke, and the Assistant Director of Residence for Academic Services, Doug Gruenewald, were formally named co-directors of learning communities. They were given the ongoing responsibility of providing continuing institutional leadership for learning communities, thus continuing the strong collaboration between Student Affairs and Academic Affairs.

Development of Learning Community Assessment

Assessment has been a central component of learning communities since their inception. Many early leaders of the learning community initiative were professional educators who recognized the important role of assessment in facilitating the development and continuous improvement of a new program. In addition, the campus had initiated its student outcomes assessment program just prior to the beginning of learning communities, and awareness of the institution's increasing emphasis on assessment was heightened.

Because of the strong residential component in many early learning communities, the Department of Residence was initially responsible for overall learning community assessment. This responsibility was transferred to the Assessment Subcommittee of the Learning Communities Advisory Committee when it convened in 1998.

The Assessment Subcommittee of the Learning Community Advisory Committee—typically about twelve to fifteen individuals—has provided leadership for learning community assessment on campus since 1998. Beyond representatives from key offices such as the Department of Residence, the Office of the Registrar, and Institutional Research, subcommittee membership is open to any interested individual. Two faculty members with expertise in assessment and evaluation co-chair the subcommittee, and several members have served as coordinators or teachers in a learning community. The committee meets about five times each semester.

The first task of the subcommittee was to develop a conceptual framework and plan for the future. The learning community assessment program has two components—an overall university-wide assessment component for the entire learning community initiative and a component that addresses individual learning community assessment. The overall component was designed to focus on summative evaluation, demonstrating accountability both to the president, who was funding the initiative, and to other stakeholders. The individual learning community component was designed to focus primarily on formative evaluation, gathering information for learning community improvement. The subcommittee's role is to support and strengthen both of these components of our assessment program.

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At the university level, we have continually asked, "What is the effect of learning community participation on first-time, full-time freshmen?" Our methodology has included student surveys, studies of academic performance, and retention analyses.

Student Surveys

The variety of learning communities had become so great that we suspected their scope extended well beyond the goals measured by the initial survey.

The initial survey. When the initial overall assessment effort began in the Department of Residence, the Academic Environment Survey (Whalen, et al. 1998) was developed to assess some of the early goals of the learning community movement on campus: awareness of university resources, satisfaction with college, knowledge of career options, multicultural understanding, and collaboration both among students and with faculty. For two years, students in learning communities completed the survey at both the beginning and end of their learning community experience, and data were analyzed to determine change. However, few useful findings resulted from the 1998 and 1999 administrations, and this led the Assessment Subcommittee to evaluate the appropriateness of the survey. We decided that there were several reasons to redesign the instrument.

First, we concluded that the survey was too general to be useful in assessing the effectiveness of learning communities as a whole. The variety of learning communities had become so great that we suspected their scope extended well beyond the goals measured by the initial survey.

Second, during the period of time in which learning communities had been developing, other interventions to support entering students had been established on campus. For example, the goals of "New Student Days" were similar to some early learning community goals—acclimation and transition to campus, including familiarity with campus resources. As a result, in some respects, the survey was no longer assessing unique features of learning communities.

Third, a control group had been included in the analyses, but its composition was less than ideal. This group was actually a collection of all the control groups established by many individual communities, along with the control group identified by the Department of Residence for its residential communities.

Finally, we decided that the survey should focus more on what students were learning in learning communities and less on general attitudes and experiences.

The second survey. The desire to address broader outcomes of learning community participation, including student learning, led us to investigate what individual learning communities were trying to accomplish. Accordingly, we undertook a study of their intended outcomes and assessment strategies. The intended learning outcomes from the 2000–01-funded learning community proposals were compiled from existing documents and grouped into common themes or categories. As shown in Table 2, seven classes of outcomes were identified: communication skills; group/team problem solving; knowledge and skills related to the discipline; global, multicultural awareness and skills; orientation and transition skills; study skills; and retention/GPA. The seven classes of outcomes shaped the development of the subsequent survey. The

assessment strategies from learning community proposals funded in 2000–01 were also examined in order to understand the variety of quantitative and qualitative approaches that were being used in each category. See Table 3.

Table 2
Intended Learning Outcome Categories and Examples

Category	Examples
Communication Skills	• Participants will be able to communicate clearly and work effectively with others in the many disciplines of horticulture. • Participants will be able to demonstrate effective written communication of discipline specific content.
Group/Team Problem	• Participants will be able to develop analytical and solving evaluative strategies as approaches to solving problems in academic and real-world problems. • Participants will be able to work effectively in a team situation in defining and solving problems.
Knowledge and Skills	• Participants will increase their knowledge of political and women's issues and develop career interest in public service, public policy, and administration. • Participants will gain an awareness of career choices related to the study of foreign language.
Global, Multicultural Awareness and Skills	• Participants will heighten their sensitivity to moral, social, and humane values that mold our land. • Participants will develop appreciation and acceptance of cultural differences.
Orientation and Transition Skills	• Participants will make connections with other first-year students, their peer mentor thus having more connections with their major and the university. • Participants will interact with faculty and staff from their department on a more frequent basis.
Retention and GPA	• Participants will define, formulate, and implement goals that will govern and regulate their academic success during their tenure at ISU. • Participants will achieve a 2.33 GPA or better in their first semester coursework.

Table 3
Quantitative and Qualitative Methods Used to Assess
Individual Learning Communities

Type	Method
Quantitative	• Grades/performance in specified courses • GPA (learning community participant, peer mentor) • Student persistence/retention • Ongoing longitudinal study of cohort • Success in admission to professional programs • Survey • Departmental course evaluations • Student participation in planned learning community activities • Ongoing formative evaluation to determine skills, attitudes, knowledge, and progress • Summative evaluation to assess overall impact of project and components
Qualitative	• Open-ended written evaluations • Student journals, writings, or papers • Focus groups • Interviews of learning community participants • Interviews with faculty mentors • Input, interviews, and field notes of faculty teaching learning community students • Interviews with industrial mentor or external clients • Evaluations of learning community components (i.e., orientation course, field trips, seminars, peer mentors) • Create "portfolios or desired resumes" periodically evaluate and develop • Observation of student meetings or activities • Survey to "get thoughts on what is needed and desired"

With a greater understanding of what learning community coordinators were trying to achieve and assess in their learning communities, the Assessment Subcommittee co-chairs and graduate assistant developed a new survey, the ISU Undergraduate Education Survey (Epperson et al. 2000). Several items were written to assess students' perceptions of their abilities in the following areas: career awareness, knowledge of the discipline, teamwork, time management, critical thinking/problem solving, written communication, oral communication, leadership, and diversity. A series of items on the pretest also evaluated the

importance students placed on fifteen experiences such as interactions with faculty members or participating in different types of activities. On the posttest, students were asked to evaluate their opportunities to pursue these experiences.

Other items assessed students' anticipated (pretest) or actual (posttest) use of time in a variety of activities such as studying alone, studying in groups, or leadership activities. Two open-ended pretest items required brief statements about what students were most looking forward to and what they were most worried about during the semester. Posttest questions asked all students about their most positive and negative academic experiences, and learning community students were asked to comment on the most satisfying and disappointing aspects of their learning communities. Learning community students also were asked to evaluate their community's peer mentors.

This survey was administered at the beginning and end of fall semesters 2000 and 2001 using a pretest-posttest design and in fall 2002 using a posttest only design. Recipients were first-time, full-time freshmen, including the target group—students who were enrolled in learning communities—as well as the remaining non-learning-community students who served as a control group. Through this process, almost the entire freshman class received a survey.

Survey results. We found that, at the beginning of fall semester, learning community and control students were more similar than they were different. The aspects of college life that they most anticipated—doing well academically and meeting new friends—were also their greatest worries. Results from some unique items on our 2000 survey indicated that, when learning community and control students began their studies, they expected to spend about the same amount of time in classes and labs; studying alone; participating in recreational, social, and leadership activities; and talking with instructors outside class. They gave about the same importance rating to a variety of factors that promote learning and contribute to persistence in college.

By the end of fall semester, the two groups were different in many ways. In all three years of the survey, we found that learning community students were more likely than control group students to report:
- earning high grades
- having professors with high expectations
- understanding the nature of their anticipated major
- having experiences that helped them reach their goals
- receiving prompt feedback about their progress

Learning community students were more satisfied with their opportunities to:
- interact closely with faculty
- receive support and advice from faculty
- participate in clubs, organizations, and government
- participate in study groups
- practice their skills
- apply learning to real-world problems

Learning community students spent more time:
- studying in groups
- participating in community service/volunteer work

Learning community students reported greater satisfaction with:
- the overall quality of their classmates
- their overall experience at ISU

For the first two years of the survey, the interpersonal connections made by learning community students did not extend to other types of connections that might have been expected from the learning community experience. However, this finding reversed itself in fall 2002. In that year, learning community students were more likely than control group students to:
- see connections among classes
- see connections between personal experiences and class learning
- be more satisfied with opportunities to interact with people from different cultural backgrounds

In 2001 and 2002, we conducted two-way (group by time) analyses of variance for items addressing students' perceptions of their abilities in the learning outcome areas of oral communication/leadership; time management; teamwork; written communication; knowledge of university, discipline, and career; and diversity. We found no consistent evidence suggesting that learning community students may have experienced greater learning gains over the semester in these areas when compared to control group students.

Ongoing challenges of survey research. Administering the survey has led to continuing challenges that have caused us to modify our administrative procedures each year. For example, although we succeeded in identifying a clearly defined control group (all non-learning-community students), we initially found it difficult to achieve a respectable return rate from this group, causing us to experiment with the length of the survey and a variety of survey delivery and return methods. Second, considerable resources are needed to administer the survey and to analyze, interpret, and summarize the findings. Because we observed a general consistency in our survey findings from year to year, even after covarying for pretest differences, we were able to omit the pretest in fall 2002. When the findings from that administration continued to be consistent, we concluded that an annual survey at the university is not really needed, although we have yet to determine the frequency that would be optimal.

Studies of Academic Performance
We found the survey results to be helpful in understanding first-year students' *perceptions* of both their first semester experiences and the outcomes associated with their experiences. However, we also wished to determine whether learning community participation was related to their *actual academic performance*. Thus, we compared the average first-term GPAs of learning community participants and non-participants in the four cohorts. The results are shown in Table 4.

Table 4
First-Term GPAs for First-Time, Full-Time Freshmen by Year and Learning Community Status

	Learning Community			Control			Statistical Significance
Entry Year	M	SD	n	M	SD	n	
1998	2.93	0.80	1080	2.52	0.93	2,720	**
1999	2.87	0.82	1603	2.52	0.92	2,419	**
2000	2.87	0.82	1491	2.48	0.93	2,800	**
2001	2.84	0.84	1687	2.56	0.91	2,853	**

** $p \leq .01$

For each cohort, the adjusted average first-term GPA of learning community students was statistically significantly higher than that of control group students.

As can be seen, for each cohort, the first-term GPA of first-time, full-time freshmen who participated in learning communities was three- to four-tenths of a unit higher than that of non-participants. In each case, this difference was statistically significant ($p \leq .01$).

Previous analyses of our data for first-time, full-time students indicated that our learning community students had a higher average ACT Composite score and a higher average high school rank than non-participants. This raised the possibility that our first-term GPA findings may have simply represented higher achievement by better-prepared students. To evaluate this hypothesis, we compared the first-term GPAs again, this time using ACT and high school rank as covariates, thereby statistically controlling their effects. For each cohort, the adjusted average first-term GPA of learning community students was statistically significantly higher than that of control group students. These results support the supposition that learning community participation leads to enhanced academic performance.

We look forward to determining whether first semester learning community participation is related to academic performance beyond the first term. In order to achieve this goal, we will have to consider the appropriateness of a variety of dependent variables. This is because even an apparently straightforward measure like cumulative GPA includes confounding factors such as grades for college credits earned during high school. Furthermore, we will have to identify measures of achievement that are appropriate within the decentralized structure of our institution in which even general education is the responsibility of departments. Nevertheless, we are encouraged by our initial findings to pursue this important area of study.

Retention Analyses

Because of the president's $1.5 million allocation in 1998 to support the development of learning communities over a three-year period, we felt that our assessment should address "bottom-line" accountability issues related to funding:

Did the expenditure pay off? Were the results worth the cost? We accomplished this goal through a series of retention studies.

Initial retention studies. In collaboration with the offices of the Registrar and Institutional Research, Doug Epperson, one of our Assessment Subcommittee co-chairs, calculated the one- and two-year retention rates of first-time, full-time students who participated in learning communities and those who did not. He has subsequently extended the analyses to include new cohorts, as well as the three- and four-year retention rates of initial cohorts.

As indicated in Table 5, in each cohort, first-time, full-time freshmen who participated in learning communities enrolled in classes at ISU the following year at a 7–9 percent higher rate than those who did not participate. The two-year retention rate for the 1998, 1999, and 2000 participants is about 13 percent higher than that for non-participants. The three-year retention rate for the 1998 and 1999 cohorts shows an 11–13 percent advantage for learning community students, and the four-year rate for the 1998 cohort exceeds that of the control group by 14 percent. By the fourth year, 41 percent of learning community students in the 1998 cohort had graduated from ISU, compared to only 25 percent of the control group. We found these results to be impressive evidence of learning community effectiveness.

The two-year retention rate for the 1998, 1999, and 2000 participants is about 13 percent higher than that for non-participants.

Table 5
Raw Retention Rates of First-Time, Full-Time Freshmen by Year and Learning Community Status

Entry Year	Group	Number of LCs*	Number of Freshmen	1-Year Retention	2-Year Retention	3-Year Retention	4-Year Retention
1998	LC	23	1,080	91%	86%	81%	80%
	Non-LC		2,720	82%	73%	68%	66%
1999	LC	36	1,603	90%	84%	80%	
	Non-LC		2,417	82%	72%	69%	
2000	LC	38	1,491	90%	83%		
	Non-LC		2,798	81%	70%		
2001	LC	47	1,690	88%			
	Non-LC		2,908	81%			

*LC = Learning Communities

As mentioned previously, however, learning community students at ISU have higher average ACT and high school ranks than control students. Because of this, we used hierarchical logistic regression analyses to test the statistical significance of differences in retention rates after controlling for ACT composite score and high school rank. Adjusted retention rates, after partialing out the variance associated with ACT composite scores and high school ranks, are presented in Table 6. As can be seen, we found statistically significant one-, two-, three-, and

four-year retention effects, even after controlling for academic ability measures. These findings indicate that the learning community benefit cannot simply be explained by the academic ability of participating students. Based on all these analyses, we concluded with confidence that first-semester learning community participation at ISU has convincing and long-lasting effects on retention.

Table 6
Adjusted Retention Rates[1] of First-Time, Full-Time Freshmen by Year and Learning Community Status

Entry Year	Group	Number of LCs[2]	Number of Freshmen	Adjusted 1-Year Retention	Adjusted 2-Year Retention	Adjusted 3-Year Retention	Adjusted 4-Year Retention
1998	LC	23	1,080	89%	83%	78%	76%
	Non-LC		2,720	83%	74%	70%	68%
1999	LC	36	1,603	88%	82%	77%	
	Non-LC		2,417	83%	74%	71%	
2000	LC	38	1,491	88%	79%		
	Non-LC		2,798	82%	72%		
2001	LC	47	1,690	86%			
	Non-LC		2,908	82%			

1. High school rank and ACT were statistically controlled

2. LC = Learning Communities

> *Based on all these analyses, we concluded with confidence that first-semester learning community participation at ISU has convincing and long-lasting effects on retention.*

Epperson was also able to provide the administration with a conservative estimate of the financial benefit of learning communities at Iowa State based on the adjusted retention rates. He did this by identifying the number of students represented by the additional percent retained through learning community participation and then multiplying this number by the cost of tuition. As he indicated in his 2000 report,

> . . . increased retention also translates into increased revenue for the university, and this increase in revenue can be estimated. For example, we can estimate the number of students who were retained at ISU because of learning community participation and the increase in tuition revenue that resulted. In this scenario, ISU gained resident tuition ($2,786 each) from forty-seven students in 1999-2000 and from 125 students in 2000-01 ($2,906 each) . . . In addition, ISU gained non-resident tuition ($9,346 each) from eighteen students in 1999-2000 and from forty-eight students in 2000-01 ($9,748 each). The total estimated tuition gain alone over those two years totals $1,130,324. Additional gains can be estimated by adding in revenue from other sources (e.g., fees, residence hall revenue, bookstore revenue, etc. (para. 17)

By applying this approach to the three years that the university invested $1.5 million in learning communities (1998-99 through 2000-01), the university realized $2.5 million in tuition savings associated with the higher retention rates of learning community participants, a 167 percent return on the original investment.

Designing our retention study so that it would be in compliance with accepted national standards for retention studies raised a number of questions. Would we use the registrar's database or would we use the Institutional Research Office's database? By what date and through what process would we determine learning community membership? Who would carry out the statistical analyses to control for initial differences between participating and nonparticipating students? When calculating retention, how would we count students who participated in more than one learning community? Would we count deceased students? Would analyses be completed early enough in the fall semester to be available when general university retention data were released and discussed?

These topics were standard items on our Assessment Subcommittee meeting agendas during the first three years of our work. Each time we thought we had them completely resolved, another nuance would emerge to be addressed. Nonetheless, we now have a method that works reasonably well, and we will continue to strive to improve it.

An expanded retention study. Although we were pleased with the results of the retention studies, we were left wondering what components of the learning community experience accounted for the positive results. As mentioned previously, learning communities vary widely on campus in terms of content, format, and key components (for example, the use and role of peer mentors). They also vary widely in terms of the intentionality with which they structure learning community experiences. For example, some learning communities are carefully designed with clear intended outcomes, planned curricula related to outcomes, and a well-developed assessment plan. Others are implemented within a loosely formulated, less intentional framework. In order to identify which learning community characteristics are related to retention, we have begun an Expanded Retention Study (see Table 7) that we plan to complete in 2003-04.

The Expanded Retention Study is a study of learning communities themselves, rather than a study of learning community students. As mentioned above, many of our learning communities are large enough to have subdivisions within them called learning teams, and thus, the unit of analysis in the Expanded Retention Study is the team. In the study, we are using a variety of team characteristics to predict team success as measured by retention, participants' perceptions/satisfaction, and academic achievement. The team characteristics that we are measuring are team structure, the nature of the learning experience in the team, the instructional emphasis of the team, and characteristics of students in the team.

As shown in Table 7, each of these broad categories has several measures within it. For example, the nature of the learning experience is measured by hours spent in initial community building, degree of active learning, degree of structured teamwork, number of hours of social activities, number of social events, and number and effectiveness of peer mentors. Some of the variables in

Although we were pleased with the results of the retention studies, we were left wondering what components of the learning community experience accounted for the positive results.

the study are measured using data in existing records, and some are measured by learning community coordinators' perceptions recorded on surveys.

Table 7
Design of Expanded Retention Study with Team as Unit of Analysis

Type of Variable	Variable Name	Measure
Dependent	Retention	Percent Retention to Sophomore Year Percent Retention to Junior Year Percent Retention in the Major Percent Retention to Graduation
	Participants' Satisfaction	Average Posttest Overall Satisfaction with ISU Average Overall Learning Community Satisfaction
	Achievement	First-Term GPA
Independent	Team Structure	Residential Nature of Team Percent in Residence Hall (Not Team Residence) Percent Residing Off-Campus Team Size Amount of Faculty Contact Outside Class Clarity of Intended Learning Outcomes Nature of Outcomes Assessment Intentional Use of Special Physical Resources Duration of the Learning Community
	Nature of Learning Experience	Hours Spent in Initial Community Building Degree of Active Learning, Including Interaction with Faculty and Other Students Degree of Structured Teamwork, In and Out of Class, Including Study Groups Number of Hours of Social Activities Number of Social Events Number of Peer Mentors Effectiveness of Peer Mentors as Rated by Students Effectiveness of Peer Mentors as Rated by Coordinators

Instructional Emphasis	Study Skills/Time Management
	Knowledge of Discipline, Career Choices, and University Resources
	Written Communication
	Oral Communication/Leadership
	Critical Thinking/Problem Solving
	Teamwork
	Diversity
Student Characteristics	Average ACT Score
	Average High School Rank
	Percent Male
	Percent Minority
	Percent International
	College of the Majority of Participants

We believe it is important to catalog what we have learned from our collective research efforts, especially because this type of scholarly activity will undoubtedly be increasing on campus.

Summary of Existing Research Findings on Campus

In addition to creating new data through surveys and studies of academic performance and retention, an important role of the Assessment Subcommittee is to understand and profit from the results of research conducted by other individuals and groups on campus. Learning community assessment and research is taking place in several departments on campus. In our College of Education, we have a Higher Education program in which several students have completed theses or dissertations on the topic of learning communities. A number of graduate students in departments such as English and Psychology have also done their research in this area.

In addition, several faculty and staff have written papers or made conference presentations about their own findings in assessing their learning communities. Titles of all the scholarly work we have identified are available at www.iastate.edu/~learncommunity, and we have recently completed a summary of their findings. Overall, we have documented twenty-seven learning community publications, more than sixty national and regional presentations, and fifteen theses/dissertations that have arisen from ISU learning community work. This list is not exhaustive, as we are continually learning about new scholarly work that has stemmed from learning community involvement at ISU.

We believe it is important to catalog what we have learned from our collective research efforts, especially because this type of scholarly activity will undoubtedly be increasing on campus. ISU has joined the Carnegie Academy Campus Program which is designed to promote campus conversations about the scholarship of teaching and learning. Furthermore, our faculty are now required to document scholarship in teaching and learning when they submit their materials for promotion and/or tenure. We also need to determine how we can best disseminate local findings to learning community coordinators so that they can use relevant information to plan and improve their own efforts.

Summary of Strategies to Strengthen University-level Assessment

Since 1998, we have implemented two surveys and utilized different methods for administering them and for establishing a control group. To varying degrees, we have found survey results to be generally useful in understanding learning community effects.

Through our studies of academic performance and retention, we have been able to provide administrators with powerful data to support decision-making about learning community continuation. We hope that our expanded retention study will help us understand the learning community factors that promote persistence at the university and other important outcomes. Finally, we hope to continue to learn about learning community effectiveness from several studies of learning communities on campus, from graduate student theses and dissertations, and from reports developed in individual learning communities or teams.

Strengthening Individual Learning Community Assessment through Faculty/Staff Development

In addition to strengthening overall learning community assessment, it is also imperative that our Assessment Subcommittee work to strengthen individual learning community assessment. The focus at the individual community level is on assessing for improvement i.e., gathering information to improve not only student learning in the community but also the effectiveness of the community's curriculum and experiences in facilitating student learning. In order to assist learning community coordinators in developing effective assessments, we embarked on a program of faculty and staff development, using both direct and indirect methods.

Direct Methods of Faculty/Staff Development

Direct methods of faculty/staff development have included the development and dissemination of best practices for learning community assessment, brown-bag discussions, workshops, and individual consultation.

We identified the need for a set of best practices to share with learning community coordinators, following our review of learning community assessment practices in 2000. This study was described in an earlier section, and its results are shown in Tables 2 and 3. Because the review uncovered many instances in which there were few or poor links between the learning outcomes proposed by coordinators and their proposed assessment strategies, the subcommittee prepared the Guidelines for Best Practice in Learning Community Assessment shown in Table 8.

Through our studies of academic performance and retention, we have been able to provide administrators with powerful data to support decision-making about learning community continuation.

Table 8
Guidelines for Best Practice in Learning Community Assessment
(Iowa State University Learning Community Assessment Subcommittee,
2002)

1. Identify the intended learning outcomes of the learning community experience.
- Cognitive outcomes related to achievement (e.g., increased communication skills)
- Affective outcomes related to student development (e.g., increased tolerance, decreased anxiety, increased career maturity, etc.)
- Social outcomes that create a supportive learning environment (e.g., increased sense of belonging)

2. Clarify how the intended outcomes of the learning community experience will help students reach the intended outcomes of the academic program.

3. Design learning community experiences to help students achieve intended outcomes.

4. Identify a control group, if possible.

5. Decide what types of measures will assess the intended outcomes (e.g., examination of student work, surveys, student reflections, etc.) Develop a realistic plan for collecting data from both learning community students and control students.

6. Collect background data on students (e.g., demographic information, learning styles) to find out:
- Who participates in learning communities
- How they respond to the learning community experience

7. Gather feedback about the effectiveness of the intervention itself. Student perceptions of the learning community experience can help interpret other assessment findings and provide information to guide program improvement.
- Assess student satisfaction with the experience
- Assess the effectiveness of important *components* of the learning community (e.g., peer mentoring)
- Consider the use of focus groups, interviews, or student reflections in journals or portfolios to find out what the experience meant to students. This approach may increase your understanding of the learning community and point out variables you haven't already identified.

8. Monitor the long-term effectiveness of the learning community by collecting retention and GPA data for both learning community students and controls.

9. Use the results. Hold a team meeting involving everyone on the learning community teaching/delivery team to look at the results and consider improvements that can be (a) incorporated in the future or (b) conveyed to future faculty, staff, and peer mentors who teach in the learning community.

The guidelines reflect our belief that it is critically important for individual learning community leaders to develop clear intended outcomes for their communities and to determine their effectiveness in reaching them. This emphasis is especially important on a campus where learning communities are so varied. We believe strongly that the learning outcomes developed by leaders should help students achieve the general education and/or discipline-specific learning outcomes of their academic programs. In addition to traditional cognitive outcomes, intended outcomes of a learning community should also include outcomes that are affective or social in nature. Learning community assessment strategies should provide coordinators with useful information about how effective their learning community is in reaching intended outcomes. Coordinators also need useful information about the effectiveness of various components of the community (peer mentors, field trips, course linking, etc.) in order to make changes leading to improved learning. Finally, it is important for coordinators to discuss and use results, sharing them with important stakeholders.

The Guidelines for Best Practice document is posted on the ISU Learning Community website, a platform for communicating information to the larger campus community. Other assessment tools and resources are also available on the website, including assessment procedures; policies and information on ISU human subjects; information available from the Registrar's Office; current and previous copies of the ISU Undergraduate Education Surveys (pretest and posttest); retention, survey, and subcommittee reports. In addition, the list of ISU-generated publications, presentations, and theses/dissertations is provided.

Other ongoing direct methods of faculty and staff development are brown-bag discussions and workshops sponsored by the assessment subcommittee and organized with the help of the graduate assistants. Topics for these sessions have been selected to address needs identified by learning community coordinators and communicated through Institute evaluations, learning community reports, and individual comments or requests for information. Topics have included assessment terminology and guidelines, current campus assessment efforts, Human Subjects compliance in learning community assessment, forming and utilizing control groups, using qualitative methodology in learning community assessment (e.g., classroom assessment techniques such as the Group Instructional Feedback Technique (Angelo, and Cross 1993) or focus groups), and creating surveys and assessment tools.

Learning community assessment strategies should provide coordinators with useful information about how effective their learning community is in reaching intended outcomes.

Additional workshops are held at the annual Learning Community Institute. We use this on-campus conference as an opportunity to disseminate assessment data and present educational sessions.

Participation in the discussions and workshops reflects the learning community initiative itself in that faculty, staff, and graduate students attend the sessions. About fifteen to twenty participants attend each workshop, and the response to these ongoing learning opportunities has been positive.

The final method of direct delivery of faculty and staff development is individual consultation. The assessment subcommittee reviews and provides feedback on individual learning community assessment plans for any coordinator who submits a plan to the committee. The response to this method has been modest, though very effective for the learning communities using it. Also, one of our graduate assistants does outreach and consultation on an individual basis for learning community coordinators who request assistance.

Participation in the discussions and workshops reflects the learning community initiative itself in that faculty, staff, and graduate students attend the sessions.

Indirect Method of Faculty/Staff Development

Indirect faculty/staff development is accomplished through structural changes to the format of the request for proposal (RFP) and annual report forms. After we disseminated our Guidelines for Best Practice, we recommended that the co-directors change the RFP form so that coordinators have to consider the best practice principles in designing their assessment plans. Through a review of annual reports, the assessment subcommittee discovered that the questions asked on the annual report form elicited little useful information about what an individual learning community had learned through its assessment. In other words, there was a disconnect between what we were encouraging communities to do (with the Guidelines for Best Practice) and what we were asking them to report. Thus, we also recommended structural changes to the annual report form.

Now, both the RFP and annual report forms request information about a learning community's assessment program that is consistent with our Guidelines for Best Practice. Asking coordinators to answer assessment questions both at a community's inception and at the time of the final report requires coordinators to be intentional about their assessment efforts. We believe that changes to the proposal and reporting forms will influence how learning community coordinators view and structure their assessment plans because of a focus on the Guidelines for Best Practice, from proposal stage to reporting.

Summary of Strategies to Strengthen Individual Learning Community Assessment

Overall, we hope to engage learning community faculty and staff in assessment by encouraging consideration of assessment at all stages of learning community development (from RFP to annual report). We also strive to involve them in ongoing education through discussions, faculty/staff workshops, our annual Learning Community Institute, and individual consultations. It is our belief that a multi-modal approach to assessment with faculty and staff will strengthen individual learning communities and ultimately the overall learning community movement at Iowa State.

Impact of Learning Community Assessment on the Organizational Culture

Learning community assessment has had several important effects on the organizational culture of Iowa State University. First, and most important, because our assessment results documented important outcomes, the administration established permanent funding for a program that began as a grass-roots initiative. The permanent funding allowed leadership for learning communities to become part of the university's organizational structure.

Second, strong collaborative partnerships between Academic Affairs and Student Affairs take place in learning community assessment, as they have in the learning community initiative in general. These partnerships have helped to create a campus-wide culture centered on student learning.

Third, stakeholders beyond the assessment subcommittee have embraced the idea of assessment as a key component of program development and improvement. Participating faculty and staff have become more aware of the importance of being intentional in their work. We have encouraged them to formulate intended outcomes, to design learning community experiences that lead to outcomes, and to assess the degree to which outcomes have been achieved.

In addition, all of the subcommittees of the Learning Community Advisory Committee have incorporated an assessment component into their work, with innovative projects and research stemming from each of them. For example, one subcommittee has begun to study the effect of peer mentoring on learning community participants, as well as on the peer mentors themselves. Another subcommittee has explored the reward structure for faculty participation in learning communities by investigating the attitudes of department chairs toward faculty involvement in learning communities. Furthermore, the institute subcommittee consistently provides opportunities during the on-campus conference to keep all constituencies up to date on assessment results, enabling them to reflect on findings and to make informed, data-driven decisions leading to program improvement.

Finally, the ultimate goal of any evaluation is to enhance understanding of the program being assessed. Our studies have clearly shown that learning communities at ISU are about helping students make connections—with other students, with faculty, and within their major. Students who make connections through their learning communities report more involvement in experiences that promote learning, they achieve better grades, and they indicate greater satisfaction with their college experience than students who do not participate in learning communities. These positive experiences lead to greater persistence at the institution, even to the fourth year and graduation.

Future of Learning Community Assessment

Encouraging learning communities to emerge at the grass-roots level has been an effective model at Iowa State University. The grass-roots approach has spurred creativity and launched many innovative programs that otherwise may never have been developed. Our communities have been founded on good ideas rather than on rules for what counts as a community. Not all good ideas work,

. . . strong collaborative partnerships between Academic Affairs and Student Affairs take place in learning community assessment, as they have in the learning community initiative in general. These partnerships have helped to create a campus-wide culture centered on student learning.

however, and because of this, we have relied on our assessment program to help us be more effective in designing and modifying our learning communities.

We initially formulated two goals for assessment—assessing for accountability and assessing for improvement. Because of uncertain funding in the early years, we began with a greater emphasis on assessing for accountability, although we deliberately established a firm foundation for assessing for improvement. Now that our learning community initiative has become part of the formal university structure, our most important assessment task is to focus on the role of assessment in enhancing learning, and we plan to do this by strengthening assessment in individual communities.

Nonetheless, we will not abandon our efforts at university-wide assessment of learning communities. On the contrary, we hope to determine how frequently we should update our university-wide survey results. We will also need to consider questions related to survey administration, including the use of ever-changing technologies.

We will continue to study retention, and we intend to be able to explain our retention effects more completely. We plan to become more sophisticated in linking the data we have to other databases such as the Cooperative Institutional Research Program's freshman survey or the results of our participation in the National Survey of Student Engagement. We also intend to continue our studies of the relationship between learning community participation and academic achievement. Finally, we intend to develop a local database of results from the many different learning community studies that have been done on campus.

As we pursue these tasks, however, we must keep our focus on our most challenging task— developing greater knowledge of the particular. We need to expand our knowledge about what is happening in individual learning communities so that we can help improve the experiences within them. We need to assist coordinators in thinking operationally about their desired learning outcomes and developing assessments that yield information for improving learning. We need to find out how useful the findings from the current ISU Undergraduate Education Survey have been in helping coordinators plan or evaluate their own community interventions. We also need to learn whether findings from the Expanded Retention Study will have implications for individual communities, and if so, how can we help coordinators use them. We need to learn how our previous faculty and staff development efforts—brown-bag lunches, workshops, and the Learning Communities Institute—have affected individual learning communities, and we also need to discover even more effective ways of continuing to promote good practice in assessment.

It is important that our assessment subcommittee build on our previous achievements and address all of these issues as we move into the future. In doing so, our goal should be to support deliberate decision-making leading to improved student learning. Our challenge will be to provide direction and structure to learning community coordinators without stifling their creativity or promoting uniformity. Innovation and variety have been hallmarks of our ISU learning communities, and through assessment, we should attempt to preserve the communities' unique grass-roots character, even as we enhance their quality.

It is important that our assessment subcommittee build on our previous achievements and address all of these issues as we move into the future.

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