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STUDENT OUTCOMES: THE IMPACT OF VARYING LIVING-LEARNING COMMUNITY MODELS

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This study explores the effect of three distinct living-learning community models on a variety of student experience and academic performance outcomes. Central to the analysis is an investigation of whether there are differences in outcomes for learning communities with different missions and structures, all three of which fall into the "Linked Course" learning community design. Even in the least coordinated, most basic, learning community model, students show more positive outcomes (first semester GPA, retention, first-year experience) than nonlearning community students. The fact that simple structures that facilitate student interaction around academic work (even without coordinated faculty involvement) have a positive effect for students of all preparation levels provides encouragement to campus leaders with limited resources who are working to develop methods for improving the undergraduate educational experience on their campuses.

KEY WORDS: residential learning communities; evaluation; outcomes.

INTRODUCTION

Developing and implementing and intentional learning community (LC) has emerged as a popular method for improving the quality of the undergraduate experience at a range of higher educational institutions. LCs have a long history in higher education, dating from the 1920s when Alexander Meiklejohn introduced the "Experimental College" at the University of Wisconsin in reaction against the increased disciplinary specialization and fragmentation of the undergraduate curriculum (Smith, 2001). The Experimental College had an integrated curriculum designed to help students actively explore the values and idea of democracy and was intentionally designed to facilitate faculty-student interaction (Love, 1999; Matthews, Smith, MacGregor, and Gebelnick, 1997; Smith,

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2001). According to Smith, "The Experimental College tried to build community and create a seamless interface between the living and learning environment" (p. 2). While the Meiklejohn experiment was short-lived, the concept was appealing to many, and over the decades, others have gone on to develop variations on his model at other institutions (Matthews et al., 1997).

LCs' most recent renaissance has its roots in the 1980s, when a host of reports emerged that criticized the quality of the undergraduate experience in American higher education and called for substantial reforms (Matthews et al., 1997). During this same period, higher education institutions faced significant financial constraints, which focused administrative attention on methods for maintaining undergraduate enrollment, particularly through improving student retention and persistence (Love, 1999).

The potential of LCs to address these pressures was supported by the work of Alexander Astin and Vincent Tinto, both of whom focused on the factors that affect student success and persistence (Lenning and Ebbers, 1999). Tinto's (1993) theory of student departure suggests that students are more likely to remain at an institution if they have opportunities to become connected to the life of the institution, in both their social and academic lives, through a process of academic and social integration. Astin's (1993) multi-institutional study of the student, faculty, and institutional factors that affect student success also highlights the importance of encouraging students' active engagement in the life of the institution. In his study, the quality and quantity of students' interactions with peers and faculty around both social and academic activities were the most important factors in facilitating this engagement.

Both of these theories suggest clear links with the LC concept, and both researchers have suggested the promise of LC models (Astin, 1993; Tinto, 1998). Lenning and Ebbers (1999) explain this link:

> The "involvement" model [Astin] and the "student departure" model [Tinto] provide theoretical and conceptual reasons why student learning communities should impact college students positively, and much research supports both models. The models suggest that learning communities should increase students' development, achievement, and persistence through encouraging the integration of social and academic lives within a college or university and its programs, and through quality interaction with peers, faculty members, and the campus environment. (pp. 49–50)

While still somewhat limited in scope (Tinto, 2000), the research on the effects of LC involvement to date support the notion of their positive influence in promoting student integration and engagement, as well as academic success and persistence. A number of syntheses of the available research on LC effects have found positive results across a variety of studies. For example, in their systematic review of the literature on college impact from 1967 to 1990, Pascarella and Terenzini (1991) looked specifically at the role of residential-learning communities on a range of student outcomes and found that students in these pro-

grams show "significantly larger gains in intellectual orientation than students in traditional curricular programs" (p. 245). While they acknowledge that the number of studies were relatively few, the results of the studies show that "living-learning communities have a significant positive effect on a number of student outcomes, including: student gains in autonomy and independence, intellectual dispositions and orientations, and generalized personal development" (p. 261). However, when interactions with peers and faculty are controlled, the positive effects of living-learning communities diminish substantially. According to the authors, these results suggest that living-learning communities exert their positive effects "through the interpersonal relationship they foster or facilitate between major socializing agents—other students [and] faculty members" (p. 262).

More recent reviews of the research on the effects of LC participation find similarly consistent and positive results. One comprehensive review (Lindblad, 2000) comes out of the work of the Washington Center for Improving the Quality of the Undergraduate experience. The author reviewed 63 studies conducted over 11 years (1988–1999). According to Lindblad, these studies indicate that students in LCs show greater institutional commitment, greater intellectual development and opportunity to analyze and integrate ideas, greater tolerance for difference and appreciation for pluralism, and demonstrate higher persistence and academic performance as measured by college grade point average (GPA). Lindblad also acknowledges the limitations of available studies, suggesting a number of areas where additional attention is needed, including more research on the full range of learning community models implemented on campuses. In another review of LC results, Lenning and Ebbers (1999) identified 16 types of student outcomes where positive LC effects have been found. These outcomes include: academic performance (as measured by GPA), retention, institutional satisfaction, greater engagement in learning, and increased quality and quantity of learning.

A few individual studies should also be mentioned. Tinto, Love, and Russo (1994) conducted a study of first-year students' experiences in LCs at three public higher education institutions (two community colleges and one 4-year university) using both quantitative indicators (student surveys, student performance, and student persistence) and qualitative indicators (site visits, class observations, interviews). They found that LCs helped students develop a "supportive community of peers," which helped them bridge their social and academic needs (p. 17). In addition, students in LCs were more socially and academically engaged, felt they had a more positive learning experience, and showed better persistence rates. These results were true for both remedial and nonremedial students.

Cheseboro, Green, Mino, Snider, and Venable (1999) developed a survey to study the effects of a variety of institutional contexts and LC models on student outcomes. In their review of the literature they echo the findings outlined above,

summarizing the findings by highlighting that LCs appear to result in improvements in three areas: student retention, student achievement, and student degree progress. They also conducted their own research on student outcomes related to LC enrollment, piloting their survey with a group of students enrolled in LCs and a group not enrolled in LCs at Indiana State University. Their results show a number of other positive LC effects consistent with findings from other studies: LC students report more interaction with both peers and faculty, and show greater involvement in the social and academic components of their institution.

Taken together, the variety of available studies and numerous reviews of these studies report consistently positive results from LC involvement. These positive student outcomes include improved student performance, persistence, and increased academic engagement, general satisfaction, and personal development.

While this evidence provides compelling support for the implementation of LCs, there is still much work that needs to be done in understanding the success of the full range of LC models that actually appear on university campuses. For the most part, the results to date have focused on the most complex LC models that feature a coordinated curriculum and intensive faculty involvement (Lindblad, 2000). The Tinto et al. (1994) study focused exclusively on these types of LCs and, in her review of previous studies, Lindblad (2000) found that over half of the 63 studies she reviewed focused on these more complex and coordinated LC models.

The reality, however, is that a much fuller range of LC models exist. The literature acknowledges this range of formats, and a number of authors have developed criteria for identifying these varied models. Some work from a model of five categories of LCs (listed from the least coordinated to the most connected):

1. Linked Courses (two courses independent of each other, but with common students),
2. Learning Clusters (courses linked by content),
3. Freshmen Interest Groups (courses linked by theme),
4. Federated Learning Communities (faculty as the linchpin), and
5. Coordinated Studies Programs (where all the students' course credits are associated with an integrated, theme-based, interdisciplinary curriculum designed through intensive faculty collaboration) (MacGregor, Smith, Matthews, and Gabelnick, n.d.; Snider and Venable, 2000).

These models can be either residential LCs or not. Lenning and Ebbers (1999) use a different framework, identifying four types of learning community models:

1. Curricular LCs (where curriculum coordination serves as the link),
2. Classroom LCs (where all learning community activity is organized at the individual course level),
3. Residential LCs (where activities occur within residence hall communities), and
4. Student type LCs (where students are brought together based on common characteristics).

Love and Tokuno (1999) provide another set of categories. In their view, LCs can reflect any or all of the following:

1. a common cohort of students taking the same class,
2. interdisciplinary teams of faculty teaching courses around a common theme,
3. students forming study groups and socializing together, and
4. collaborative class activities and assignments.

The fact that a great variety of models are all referred to as LCs, and the reality that they are likely implemented with varying degrees of success, raise a number of evaluation questions requiring attention. For example: Do less elaborate models actually constitute LCs? As the three different categorizations of LCs above suggest, LCs (as implemented on campuses) can reflect a range of resources and efforts—from rather humble opportunities for students to make their own connections across their courses with little faculty involvement to models with deep curricular and faculty coordination (like the coordinated studies model described above, which has received the most research-based attention). Not all who study LCs believe that all of these varied models actually "count" as LCs. Citing Matthews (1994), Lenning and Ebbers (1999) say that "in their most beneficial form, faculty carefully plan the membership, format, linkages, and programming for the learning community" (p. 16). They go on to quote Matthews:

> Learning communities are not merely block programming, an administrative convenience that facilitates registration and use of rooms. Rather they are conscious intellectual structures that teachers create, and students participate in, to share a high quality and enduring educational experience. . . . There are as many variations on the models of learning communities as there are institutions willing to participate. All, however, strive to provide an intense and supportive environment for intellectual growth and development. (p. 16)

It may indeed be the case that these more intensive models, with deep faculty involvement, are more effective in enhancing students' experience and improving student outcomes. The very limited research on LC model comparisons suggests this may be the case (Lenning and Ebbers, 1999; Tinto et al., 1994).

Although, ideally, the coordinated model may be preferred, the financial reality on many campuses is that this model is difficult to support, and institutions have instead developed more modest LCs. Do these more modest models still achieve the goals of the LC concept: facilitating student academic and social integration (particularly through increased faculty-student and student-student interaction) and improving academic performance? Because most of the research on LCs has been done on the more elaborate LCs (Lindblad, 2000), we know very little about the impact of these more modest LC attempts. It is therefore important to focus research on these less elaborate models to determine the extent to which they facilitate the core LC goals, which are fairly clearly realized in the "high end" models.

The particular role of a *residential* component in LC effectiveness also requires further investigation. Much of the research on LCs in recent years has focused on models adapted in institutions without residential components. In these cases, the LC provides the most intensive opportunity for students to interact with each other in substantive ways. In a residential environment, the impact of LC participation may be minimal as students already have a variety of opportunities to interact. However, Tinto et al. (1994) suggest that it might be particularly difficult for students to integrate the social and academic elements of their lives in residence halls, where the social side of college life is often pitted against the academic side. They say that particularly in large institutions, students "find that learning is a highly individualistic, often alienating, experience" (p. 10). Therefore, it seems useful to pursue the role LCs can play in facilitating academic and social integration in a residential learning environment.

In addition to pursuing the relative effect of more modest LC models and residential models, further investigation is needed on the success of the full range of LC implementations. Some of the most positive and widely disseminated results on the impact of LCs appear to emerge from studies that do not necessarily include a full sample of the LCs on the campuses studied. For example, in the extensive work of Tinto et al. (1994), the researchers describe their selection methodology as follows: "In each institution, we selected a sample of learning community classes that in the view of the program staff *best captured the intent of their program*" (p. 3; emphasis added). The question emerges: Would the results of this study have been different had the full range of LCs been analyzed? Again, are the generally positive effects of LCs found in the literature driven somewhat by the selection of those with the most attentive implementation and not the full range of learning communities that actually exist on campus?

Finally, the role of student self-selection into LCs remains an issue in understanding their impact. In many cases, not all students on campus are involved in LCs, and students are not randomly assigned to the ones that do exist. In studies where this is the case, and controls have not been put into place, the

positive findings may be the result of students' own academic preparation and determination. For example, it is possible that students who are most motivated to succeed take advantage of the LC opportunities and, as a result, retention and academic performance rates for LCs are better because of individual student selection—not the program components themselves. Some recent studies (Snider and Venable, 2000) are particularly attentive to these concerns. However, much more work is needed in pursuing these issues.

Lenning and Ebbers' (1999) summary of the findings of one study provide the qualifications needed for understanding current LC results and suggests where future research must lead.

> Although we do not have complete assurance that the different models [in this study] were implemented with equal effectiveness or that the student groups were comparable on all potentially relevant variables, the results suggest that well-done, more concentrated, longer-term approaches to learning communities that involve faculty as active, intentional participants are more effective than others. (pp. 53–54)

Therefore, we have consistent and compelling evidence that *some* LC models and implementations work very well to foster student academic and social integration and facilitate student academic success and persistence. However, the actual value (or impact) of any particular LC design (particularly those that are more humble in resources) on any specific campus may vary substantially from these general findings and may be affected by factors that have not yet been adequately controlled in all studies.

To answer the questions raised above, the present study explores the relative impact of three LC models, each with different missions and slightly different structures, while controlling on a number of potentially influential variables. The three models represent the full range (and implementation) of LCs on our campus, therefore avoiding the selection bias found in other studies of the LC effect.

To determine effectiveness, this study draws from the frameworks developed by Tinto and Astin to explore the extent to which these more modest learning communities facilitate student social and academic integration into the university environment as well as foster their engagement in their own learning. The study uses outcome and experiential measures similar to those used in other studies of the impact of LCs. These include student persistence, academic performance, and a number of indicators of students' academic and social integration and engagement including: quality and amount of peer interaction, amount of interaction with faculty, development of positive learning behaviors, involvement in campus activities, level of institutional commitment, and positive perceptions of the academic climate. With this range of outcomes, this study explores not only the primary *student success outcomes* (academic performance and persistence) but also explores the *experiential outcomes* often associated with

LC involvement and makes it possible to determine differences between LC involvement and noninvolvement, and *among* LC models.

LEARNING COMMUNITIES AT THIS UNIVERSITY

The present study is conducted at a large (18,000 undergraduate and 5,000 graduate students) moderately selective public Research I University in the northeast. Our university provides an ideal environment in which to study some of the questions raised previously. We have supported a number of residence hall living-learning communities for over 25 years, and each year we enroll about a third of the first-year students in them. These living-learning communities include:

1. *Residential Academic Program (RAP):* RAP has been a presence on campus for over 20 years. It serves as the model on which our more recent variations are based. RAP students live in a common residence hall and enroll in a common freshman-writing course. In addition, they choose from a range of general education courses, some of which are taught in the residence hall. These general education courses are often large lecture courses with small discussion sections, led by Teaching Assistants, which are reserved for RAP students. RAP is open to all first-year students on a first-come, first-served basis. Each year there are over 700 first-year students enrolled in RAP, one half of which are undeclared.
2. *Talent Advancement Program (TAP):* TAP is a variation of RAP that was first implemented over 10 years ago. It is a selective LC that invites students with specific majors to enroll in an LC program designed by their major department. TAP enrolls over 300 students each year in these programs, covering 13 majors (3 applied, 3 social sciences, 6 science/math, and 1 humanities). TAP students take at least two courses together and participate in a freshman seminar designed to introduce them to the work of the faculty. Most of these TAPs have faculty coordinators who work closely with students in the program.
3. *Honors College Learning Community:* Starting in fall 1999, the campus added an additional LC experience specifically for students admitted into the university's new Honors College. In this model, students sign up for one of a variety of small thematic LCs and co-enroll in two honors general education courses per semester of participation. For the most part, these courses are small and faculty taught.

All three of the models studied fall in to the Linked Course (and least coordinated) cluster in the general categorization of LC models (Snider and Venable, 2000), and in Lenning and Ebbers' (1999), residential LC category. However,

neither of these sets of criteria adequately reflects the variability within these three programs.

The first of these differences is in the criteria used to admit students into the programs. Two of the LCs (TAP and Honors) are selective in their admission process; RAP, is open to students on a first-come, first-served basis. In addition, one model (TAP) is reserved specifically for students in selected majors, while Honors and RAP enroll a mix of declared and undeclared students.

The structures of the programs also vary. All three models draw the foundation of their design from the RAP model, which means that students live together in a common residence hall and take at least two classes together. TAP and Honors, however, offer additional tailored options for their students. Each TAP program has a faculty sponsor who, to varying degrees, shepherds students through their TAP year. Many TAPs also have major-specific seminars where faculty from the specific discipline meet with students. In general, students in TAP and Honors enjoy more direct faculty involvement and may have more of a sense of a group identity through a shared major or through shared enrollment in the Honors College. In addition, Honors students are more likely to have more small classes.

Therefore, a more nuanced method for categorizing these programs is needed to understand the variability across models. Tokuno has developed a method for mapping learning communities on a continuum across a number of relevant dimensions (Love and Tokuno, 1999). Tokuno's framework includes five dimensions (student collaboration, faculty collaboration, curricular coordination, shared setting, interactive pedagogy), and LCs can be ranked as low, medium, or high on each dimension. Love and Tokuno suggest that the more developed the LC is on each dimension, the greater benefits that will accrue for student participants. Although not included in Tokuno's framework, the issue of shared identity has also emerged in the literature as an important component of LCs (Matthews et al., 1997). As suggested previously, it also serves as a key difference across the three LC models under investigation here. As a result, this dimension is also included in the framework. Using this synthesis of the LC structural dimensions, Fig. 1 indicates where each of the three LCs under analysis in this study fall on the continuum of each of these six dimensions.

Using these categories, it becomes clear that there is variety across the three LCs, although all three spring from the same basic model. While all three models are similar on level of curricular coordination (low) and shared setting (high), TAP has a stronger focus on faculty and student collaboration, and TAP and Honors LCs both provide a stronger focus on group identity. Because the programs have no pedagogical coordination, the type of pedagogy used is completely dependent on the individual instructors' styles and preferences. Note that the RAP program falls in the Low Focus category more frequently than the other two programs, illustrating its position as the least coordinated and structured of the three models under study here.

Dimension	Low Focus	Medium Focus	High Focus
Student Collaboration	RAP/HONORS	TAP	
Faculty Collaboration	RAP/HONORS	TAP	
Curricular Coordination	TAP/RAP/HONORS		
Shared Setting			TAP/RAP/HONORS
Group Identity	RAP		TAP/HONORS
Interactive Pedagogy	◄	Varies by Instructor	►

FIG. 1. LC dimensions fostered by program structure.

A cursory analysis of one important outcome, persistence, suggests the valuable role these three LCs play on this campus. Table 1 shows the retention rates for LC participants and nonparticipants across two recent first-year student cohorts, both in the aggregate and separated by learning community model. While in the aggregate, the one-year retention rate for students in learning communities is consistently higher, the disaggregated set of retention rates provides a more complete picture of the effect of learning communities on student persistence emerges.

For the 1999 cohort, the TAP and Honors program retention rates are higher than that for the RAP program, although all three are higher than the rate for non-LC students. Similar patterns are found in the 2000 cohort, where both Honors and TAP rates are higher than those for RAPs, although all three are again higher than those for students not in a learning community. These patterns are not necessarily surprising, however, given that the Honors and TAP programs are selective learning communities that enroll some of the most well-prepared students on campus. The rates for these two programs clearly inflate the LC retention rates when the rates for all LC communities are aggregated together.

TABLE 1. One-Year Retention Rates by Learning Community (LC): All First-Time First-Year Students (in percentages)

	No LC	In a LC	TAP	RAP	Honors
1999 Cohort Percent Retained	81.4	87.8	89.7	85.4	93.7
(N)	(2,201)	(1,169)	(315)	(644)	(210)
2000 Cohort Percent Retained	81.5	88.6	89.7	87.0	92.3
(N)	(3,104)	(1,138)	(297)	(650)	(191)

As these differences in retention rates suggest, when a campus supports more than one LC model on campus, answering the question, "Do learning communities 'work' on our campus?" becomes a complex question. One cannot assume that all models have similar effects, nor can one assume the results will be completely consistent from year to year.

To provide more in-depth answers to the "Do learning communities 'work'?" question on our campus, we conducted a multilensed analysis of the impact of the learning communities that serve our students. The comparative study looks at students at specific junctures in their first year, reflecting the input, experience, and output components that Astin (1991) highlights as critical to consider in any assessment of institutional effectiveness, and analyzes the effects of the different LC models on a set of student success outcomes (academic performance and one-year retention) and on student experiences directly related to the underlying goals of LCs: improved social and academic integration and student engagement. This study makes it possible to identify the specific and unique contributions of these different LC models and can help inform the development of additional living-learning communities. The study also has broader significance because it makes it possible to evaluate the relative success of the three living-learning models within a common institutional context. This perspective is unusual because campuses often support only one type of living-learning model, which makes it impossible to assess different approaches within a similar context. Finally, this study looks at all of the academic LCs on campus, not just a selective few that represent the best implemented versions of the models.

METHODOLOGY AND DATA SOURCES

As indicated earlier, this study explores the extent to which these three LC models are successful in supporting student success after controlling for students' entering characteristics. This is done with two different sets of indicators. The first set focuses on direct measures of student academic success at an institution: first semester performance and one-year persistence. The second set focuses on specific aspects of the student experience that are related to successful academic and social integration and engagement. These include measures of student interaction with peers and faculty members, students' involvement in their own learning and in extracurricular activities, and their general perceptions of the institutional environment and institutional commitment.

The comparison of the living-learning experiences focuses on the following questions:

1. Do non-LC students and RAP, TAP, and Honors LC students differ in preparation at entrance? (Because program participation is voluntary, a consideration of these inputs is crucial to a complete understanding of the impact of the programs).

2. What effect does enrollment in one of these LCs have on students' academic performance and one-year retention (after controlling on entering characteristics and preparation), as compared with students not in an LC?
3. At the end of the first semester, do the students' experiences with social and academic integration differ in significant ways across these four groups?

The investigation has relied on two data sources, described below, to capture information about students at different points during their first year on campus:

1. *Longitudinal student database information* to document students' entering characteristics and academic preparation and to track their academic performance and enrollment patterns over the course of the first year.
2. *End-of-first-semester survey.* The sample for this survey, which was conducted at the end of the first semester, included a random sample of first-year students in LCs and a random sample of those not in an LC who enrolled in the university in fall 2000. The survey focuses on students' first-semester academic and social experiences (particularly those related to academic and social integration) and was developed after consulting the LC literature, as well as drawing from the experiences of the individuals responsible for designing and implementing the RAP, TAP, and Honors LC programs on campus. The Student Affairs Research, Information, and Systems Office, which does polling on students throughout the academic year, administered it. The response rate for the sample of students in an LC was 59% (n = 477), for those not in an LC the response rates was 62% (n = 328).

When possible, data for this article are drawn from the two most recent cohorts of first-year students from whom data are available (fall 1999 and fall 2000). Similar results across more than one cohort add stability to the conclusions one draws from the results. Therefore, 2 years' worth of data are used to explore the consistency of findings from one year to the next. Chi-square and ANOVA are used to compare the two groups on specific variables. To study the impact of these programs on academic performance and one-year retention, linear and logistic regression techniques are used.

Limitations

While this study takes a range of student characteristics into account that might influence the outcomes under analysis here, the analyses do not necessarily include all potentially relevant input measures (student motivation, interest in working with others, etc.). Nor does the study look directly at the possible differential impact on students of different racial/ethnic backgrounds (except in controlling on that variable in the multivariate analyses). As the demographic

data will show, there are differences in participation in LCs by race/ethnicity; the implications of these differences are not explored here. Finally, while the study uses three different categories of student outcomes (first-semester GPA, one-year retention, and experiences in the first semester), the measures of student experience are limited to survey data, and the reliabilities for some of these scales are relatively low. Using additional, and more robust, measures of students' experiences would help strengthen the conclusions drawn from this study.

RESULTS

Inputs: Differences at Entrance

Do LC and Non-LC Students Differ at Entrance?

Throughout this study, three sets of variables are used to explore (and control for) differences in the four groups of students under investigation. The first set focuses directly on measures of student academic preparation. As indicated earlier, participation in TAP and the Honors LC is selective. Students are invited to participate based primarily on their high school performance and SAT scores. On the other hand, students are able to sign up for RAP on a first-come, first-served basis. Given these differences in recruitment strategies, one would expect differences in academic preparation across the three LCs that might also lead to differences between those in LCs and those not enrolled in these communities.

The second set of measures used focus on a set of demographic characteristics that are often used in higher education research to reflect important differences in precollege experiences and early experiences in college: race/ethnicity, sex, and in-state enrollment status. In addition to serving this important theoretical role in this study, each of these demographic factors was significantly related to at least one of the outcome variables of interest in this study in bivariate chi-square (for retention) and ANOVA (for first semester GPA) analyses.

Finally, two programmatic experience variables are included because, to varying degrees, they each offer other opportunities to build connections with peers and faculty and, therefore, can serve to make this large university more manageable. The first is enrollment in one of the campus' special support programs. These programs are designed to offer additional academic and social support to entering students of color who are either required to participate (based on academic preparation) or voluntarily participate. The second variable reflects students' major affiliation. First-year students attached to specific majors are more likely to have opportunities to develop academic affiliations than students who enter the university undeclared. Again, each of these programmatic variables was also significantly related to at least one of the outcome variables used in this study.

Table 2 provides the academic preparation, demographic, and programmatic

TABLE 2. Entering Student Characteristics (University Student Database)

	1999 Cohort					2000 Cohort				
	Sign.	None	RAP	Tap	Honors	Sign.	None	RAP	Tap	Honors
2A. Entering Academic Preparation (*Means*)										
Means HS GPA	P = .000 (N = 4042)	3.20	3.18	3.53	3.89	P = .000 (N = 3705)	3.27	3.25	3.58	3.95
Mean Math SAT	P = .000 (N = 4015)	562	542	625	664	P = .000 (N = 3686)	559	551	631	652
Mean Verbal SAT	P = .000 (N = 4015)	553	547	622	653	P = .000 (N = 3686)	544	551	624	657
2B. Demographic Characteristics (*percentages*)										
Race/Ethnicity	P = .000 (N)					P = .000 (N)				
African Amer./Black	(142)	4.2	3.3	0.8	0.0	(132)	4.5	1.7	1.8	1.0
Asian American	(298)	7.4	7.3	7.1	7.1	(292)	9.1	4.7	6.1	6.8
Hispanic	(144)	3.4	5.8	1.1	1.8	(132)	4.1	3.2	1.2	1.4
Native American	(21)	.6	0.5	0.0	0.0	(17)	.4	.7	.6	.5
White	(3000)	74.0	71.9	81.0	71.0	(2842)	73.0	84.1	79.4	80.2
Non-Resident Alien	(37)	1.1	0.0	0.0	2.7	(40)	1.5	.1	.3	.5
Non Reporting	(410)	9.2	11.2	9.9	17.4	(276)	7.4	5.5	10.6	9.7
Gender	P = .000 (N)					P = .000 (N)				
Female	(2179)	51.7	61.1	54.0	53.6	(2076)	52.7	66.3	50.9	59.4
Male	(1873)	48.3	38.9	46.0	46.4	(1655)	47.3	33.7	49.1	40.6
Residency	P = .000 (N)					P = .000 (N)				
Out of State	(978)	26.4	17.7	24.4	18.3	(979)	27.6	27.4	19.1	16.9
In-State	(3074)	73.6	82.3	75.6	81.7	(2752)	72.4	72.6	80.9	83.1
2C. Programmatic Experiences (*Percentages*)										
School/College Affiliation	P = .000 (N = 4052)					P = .000 (N = 3731)				
Undeclared		36.5	53.0	.3	28.6		39.2	58.3	.6	35.7
Humanities/ Social Sci.		11.4	9.9	5.7	13.8		14.6	13.8	14.2	15.0
Natural Science/ Engin.		20.1	10.2	37.5	37.1		19.9	9.6	41.8	31.4
Applied Majors		20.8	8.7	26.7	11.2		19.7	7.5	25.2	10.6
Pre-Majors		11.3	18.2	29.8	9.4		6.6	10.8	18.2	7.2
Support Program	P = .000 (N = 4052)					P = .000 (N = 3731)				
In support program		8.1	10.4	3.1	2.2		12.6	7.0	3.6	2.9
Not in program		91.9	89.6	96.9	97.8		87.4	93.0	96.4	97.1

variables for students in the three LCs and for those not in an LC community for both the 1999 and the 2000 cohort.

As Table 2 shows, there are a number of significant differences across the groups of students. Turning first to measures of academic preparation (Section 2A), comparisons of means using ANOVA consistently show that high school GPA and SAT scores are higher for those students in TAP and Honors than for students in RAP or those not enrolled in an LC. The chi-square comparison of demographic characteristics (Section 2B) also shows significant differences. While there is some variability, in general the LCs have fewer students of color than are present in the non-LC population. This is most consistently true in the 2000 cohort. In both cohorts, RAP enrolls more female students than are enrolled in any of the other LC or non-LC categories. In 1999, RAP and Honors have fewer out-of-state students enrolled; in 2000, it's TAP and Honors that have fewer out-of-state students.

Finally, the programmatic experience variables (Section 2C) also show significant differences. For example, in both cohorts, RAP has more students who are undeclared (and therefore not affiliated with a school/college). There are also more non-LC students and more students in RAP who are also enrolled in one of the special support programs.

These results highlight important differences across LCs. RAP students, in most ways, look more like the students not enrolled in an LC than do students in TAP or Honors LC. For the measures used in this study, TAP and Honors students are better prepared than RAP or non-LC students. Again, this is not surprising given the selective nature of enrollment in these two programs. These differences suggest the importance of controlling on these input variables when exploring the outcomes of these varied LC programs.

Outcomes: Differences in Academic Performance and One-Year Retention

What Relationship Does LC Enrollment/Non-Enrollment Have with Students' Academic Performance and One-Year Retention?

First-Semester GPA. A central mission of the learning communities is to provide students with a learning environment that helps support their academic success. In simple mean comparisons, students in all three learning communities have substantially higher first-semester GPAs than students not in an LC. Of course, as the analysis of entering characteristics shows (Table 2), there are differences among these three groups that may affect first-semester performance. To determine the extent to which differences in first-semester college GPA remain after other entering characteristics are taken into consideration, multiple regression was used to explore the role of RAP, TAP, and Honors LC

enrollment on first-semester GPA, after controlling on the entering characteristics discussed above and presented in Table 2.[1]

Table 3 shows the results of the linear regression for predicting first-semester college GPA for both the 1999 and 2000 first-year cohorts. These results show that, in both cohorts, RAP, TAP, and Honors each has a significant (at the $p \leq .05$ level) positive effect on first-semester GPA, even after all these entering characteristics are taken into consideration. In both cohorts, there is a stronger effect for TAP and RAP than for the Honors LC.

One-Year Retention. Another primary purpose of the LCs is to facilitate improved student retention. As mentioned earlier, for both cohorts, the one-year

TABLE 3. First Semester GPA Linear Regression Model: Comparative LC Effect

	1999 Cohort			2000 Cohort		
	N = 3948			N = 3580		
	B	Beta	Sig.	B	Beta	Sig.
(*Constant*)	−.547		.000	−.938		.000
High School GPA	.681	.372	.000	.725	.384	.000
Verbal SAT	.0004	.043	.016	.001	.064	.001
Math SAT	.001	.115	.000	.002	.164	.000
Gender (1 = Female)	.120	.068	.000	.097	.058	.000
Support Program (1 = In a Program)	.119	.037	.054	.127	.046	.016
Residency Status (1 = Out of State)	.015	.008	.595	.033	.017	.226
Race/Ethnicity[a]						
African American/Cape Verdean	−.064	−.014	.422	−.064	−.014	.385
Hispanic	.088	.019	.223	−.074	−0.16	.312
Asian	−.088	−.026	.094	−.137	−.044	.008
School/College Affiliation[b]						
Humanities/Social & Behavioral Sciences	.073	.026	.094	.065	.027	.084
Natural Science/Math/Engineering	−.161	−.075	.000	−.204	−.099	.000
Applied Majors	−.029	−.013	.404	−.017	−.007	.642
Arts and Sciences Pre-Majors	.068	.027	.086	.029	.010	.527
Residential Academic Program[c]						
TAP	.217	.070	.000	.187	.064	.000
RAP	.211	.084	.000	.206	.100	.000
Honors LC	.165	.043	.006	.121	.034	.035
	Adjusted R^2 = .224			Adjusted R^2 = .268		

[a]Reference group for Race/Ethnicity = White/Nonreporting Race/Ethnicity Students.
[b]Reference group for School/College Affiliation = Undeclared Majors.
[c]Reference group for Residential Academic Program = Students in No Program.

retention rates show that all three LCs have higher retention rates than is true for non-LC students (see Table 1). Again, it is important to control for the significant differences in students at entrance. To do so, logistic regression is used to control for entering characteristics and to determine the effect of these three LCs on one-year retention. Logistic regression makes it possible to calculate the odds of LC participants leaving the university after their first year.

As Table 4 indicates, even after controlling on entering characteristics and programmatic variables, RAP, TAP, and Honors all have significant and strong effects on one-year retention in the 1999 cohort.[2] For example, in the 1999 cohort, RAP students were 34% less likely to leave after their first year than similar students not enrolled in an LC, TAP students were 33.3% less likely to leave, and Honors students were 60.4% less likely to leave. In the 2000 cohort, the odds ratios for TAP and RAP show similar patterns and are significant at $p \leq .10$. The odds ratio for Honors is less dramatic than in 1999 and does not reach statistical significance.

While retention itself is an important outcome, a further clarification of retention can provide additional insight into the effects of LC enrollment. Students do not all leave for the same reason, and one of the biggest distinguishing characteristics is *required* withdrawal (where the university dismisses the student because of severe academic difficulty) vs. *voluntary* withdrawal (where the student makes the decision to leave the university). Because academic dismissal indicates poor academic performance, the differences in college preparation across the various LCs may lead to different LC effects when type of withdrawal is used as the dependent variable.

Table 5 shows the percentage of students in each LC category who left for one of these two reasons. Withdrawal and dismissal rates for all three LCs are lower than for non-LC students. The strength of these differences varies, however, by cohort and LC type. In general, the differences in voluntary withdrawal rates are most dramatic for TAP and Honors students. For dismissal rates, Honors shows the greatest difference. The differences between non-LC and RAP voluntary and required withdrawal rates are generally less dramatic.

Of course, academic preparation at entrance can be a key factor in predicting voluntary withdrawal vs. dismissal. Table 6 shows the effect of the LC programs on these two types of attrition after controlling on entering characteristics.

With respect to voluntary withdrawal (Section 6A), the LC effect shows different patterns across the two cohorts studied. In the 1999 cohort, RAP and TAP appear to have similarly strong effects (students in these two programs have just under a 30% greater chance of not withdrawing). However, the TAP effect does not reach statistical significance (at the $p \leq .10$ level), probably because of the small sample of students in this category ($N = 29$ TAP students as compared with $N = 87$ RAP students). Honors LC enrollment has an even stronger effect on voluntary withdrawal. In the program's first year of operation (1999 cohort),

TABLE 4. One-Year Retention Logistic Regression Model: Comparative LC Effect[a]

	1999 Cohort N = 3947		2000 Cohort N = 3613	
	EXP β (Odds Ratio)	Significance Level	EXP β (Odds Ratio)	Significance Level
High School GPA	.536	.000	.398	.000
Verbal SAT	1.002	.033	1.002	.006
Math SAT	.998	.008	.997	.000
Gender (1 = Female)	.979	.826	.918	.393
Special Program Status (1 = In Program)	.715	.142	.695	.075
Residency Status (1 = Out of State)	1.200	.079	1.319	.007
Race/Ethnicity[b]				
African American/Cape Verdean	1.091	.747	.527	.041
Hispanic	1.000	1.000	1.110	.697
Asian	1.157	.433	1.967	.002
School/College Affiliation[c]				
Humanities/Social and Behavioral Sciences	.875	.368	.993	.960
Natural Science/Math/ Engineering	.859	.249	1.014	.923
Applied Majors	.657	.002	.807	.126
Arts and Sciences Pre-Majors	.831	.182	.849	.368
Residential Academic Program[d]				
TAP	.667	.035	.690	.070
RAP	.660	.001	.616	.000
Honors LC	.396	.003	.692	.199

[a]Odds Ratio values of <1.00 indicate *decreased* risk of leaving.
[b]Reference group for Race/Ethnicity = White/Nonreporting Race/Ethnicity Students.
[c]Reference group for School/College Affiliation = Undeclared Majors.
[d]Reference group for Residential Academic Program = Students in No Program.

Honors students were 52% less likely to voluntarily withdraw. In the 2000 cohort, students in all three LCs are approximately 35% less likely to leave voluntarily, although only TAP and RAP reach statistical significance ($p \leq .10$).

The next section (Section 6B) shows the same analysis for those students who

TABLE 5. Voluntary and Required Withdrawal by Learning Community

	1999 Cohort				2000 Cohort			
	Percent Withdrawn by Reason and LC Model (N)				Percent Withdrawn by Reason and LC Model (N)			
	None	RAP	TAP	Honors	None	RAP	TAP	Honors
Withdrawal Reason								
Voluntary Withdrawal	13.1 (*357*)	11.5 (*87*)	8.2 (*29*)	6.3 (*14*)	13.9 (*340*)	10.4 (*78*)	7.9 (*26*)	7.3 (*15*)
Academic Dismissal	5.9 (*160*)	3.3 (*25*)	2.3 (*8*)	0.0 (*0*)	5.0 (*121*)	2.7 (*20*)	2.1 (*7*)	0.5 (*1*)

were required to leave because of academic dismissal. In the 1999 cohort, TAP does not reach statistical significance but RAP has a strong effect, with students in this LC 49% less likely to be dismissed. Because there were no Honors students who were dismissed, that LC is excluded from the analysis. In the 2000 cohort, TAP is again not significant, and neither is Honors. RAP, however, still has a strong effect, with RAP students 44% less likely to be dismissed.

Outcomes: Differences in First-Semester Experience

At the End of the First Semester, Do Students' Social and Academic Integration Experiences Differ in Significant Ways Across These Four LC?

The analyses to this point have shown relatively robust LC effects for two student outcomes: first-semester GPA and one-year retention (voluntary and required withdrawal as well as retention overall). While there is some variability across cohorts and outcomes, the results clearly suggest that there is something about the LC experience as presented in all three of the models that has a positive effect on the first-year student experience. This third part of the study explores how the student experience in the first semester might differ by LC status. Here the focus is specifically on those elements of the student experience that the LC literature suggests are central to the success of the LC community.

First-year students in the 2000 cohort were surveyed at the end of their first semester at the university. The survey focused on experiential outcomes that the LC literature, as well as those involved with LCs on our campus, suggests are the positive effects of LC experience related to academic and social integration:

TABLE 6. Voluntary and Required Withdraw Logistic Regression Model: Comparison of LC Effects[a]

	1999 Cohort		2000 Cohort	
	N = 3757		N = 3528	
	EXP β (Odds Ratio)	Significance Level	EXP β (Odds Ratio)	Significance Level
A. *Voluntary* Withdraw				
High School GPA	.687	.003	.508	.001
Verbal SAT	1.001	.143	1.003	.000
Math SAT	.999	.083	.998	.004
Gender (1 = Female)	1.216	.076	1.060	.611
Special Program Status (1 = In Program)	.549	.031	.666	.093
Residency Status (1 = Out of State)	1.465	.001	1.544	.000
Race/Ethnicity[b]				
African American/Cape Verdean	1.063	.854	.600	.153
Hispanic	1.084	.783	1.058	.858
Asian	1.331	.169	1.718	.010
School/College Affiliation[c]				
Humanities/Social and Behavioral Sciences	.933	.677	1.014	.929
Natural Science/Math/Engineering	.801	.151	.886	.441
Applied Majors	.640	.004	.807	.169
Arts and Sciences Pre-Majors	.820	.211	.716	.112
Residential Academic Program[d]				
TAP	.706	.107	.651	.059
RAP	.736	.023	.629	.001
Honors LC	.481	.023	.651	.149

TABLE 6. (*continued*)

	1999 Cohort N = 3481		2000 Cohort N = 3177	
	EXP β (Odds Ratio)	Significance Level	EXP β (Odds Ratio)	Significance Level
B. *Required* Withdrawal				
High School GPA	.252	.000	.161	.000
Verbal SAT	1.002	.098	.999	.614
Math SAT	.997	.004	.996	.009
Gender (1 = Female)	.554	.001	.599	.009
Special Program Status (1 = In Program)	1.132	.739	.651	.208
Residency Status (1 = Out of State)	.581	.013	.672	.091
Race/Ethnicity[b]				
African American/Cape Verdean	.965	.932	.289	.037
Hispanic	.810	.638	1.286	.589
Asian	.822	.588	2.796	.001
School/College Affiliation[c]				
Humanities/Social and Behavioral Sciences	.692	.195	.819	.527
Natural Science/Math/Engineering	1.084	.718	1.626	.054
Applied Majors	.746	.216	.878	.644
Arts and Sciences Pre-Majors	.899	.666	1.423	.275
Residential Academic Program[d]				
TAP	.616	.208	.862	.725
RAP	.506	.003	.559	.025
Honors LC	—[e]	—[e]	.476	.471

[a]Odds Ratio values of <1.00 indicate *decreased* risk of academic dismissal.
[b]Reference group for Race/Ethnicity = White/Nonreporting Race/Ethnicity Students.
[c]Reference group for School/College Affiliation = Undeclared Majors.
[d]Reference group for Residential Academic Program = Students in No Program.
[e]Honors LC not included in model because there were no dismissed Honors Students.

1. General Social Adjustment and Integration (degree of institutional commitment, involvement in extra-curricular activities, engagement with diversity);
2. Academic Integration
   a. Peer interaction around academic work (e.g., positive academic-related friendships, amount of time doing homework with peers, participation in group projects),
   b. Faculty interaction outside the classroom (amount of contact with faculty outside of class to discuss academic performance, discuss career options, socialize informally, and discuss course topics outside of class),
   c. Positive academic behaviors (e.g., being well prepared for class, participate in class discussions, amount of time spent doing homework); and
   d. Positive academic climate (positive experiences in the classroom, perception of faculty being concerned about students, experiencing intellectual stimulation, having opportunities to integrate ideas across disciplines, etc.).

Factor analysis was used to determine potential scales. The items making up the scales, and their α reliabilities, are listed in Appendix B.

Table 7 shows the results of three comparisons. In the left-hand column, the scale mean comparisons for students in an LC (all three models combined) are compared with those not in an LC. In the middle column, these same scale means are compared separately across the three LC models to determine if there are significant differences across the three models. The last column shows the effect (standardized β coefficients) of each LC comparison (LC vs. no LC, TAP, RAP, Honors LC) on each experience variable after controlling on high school GPA, SAT, gender, race/ethnicity, residency status, special support program enrollment, and school/college affiliation using linear regression. This last set of analyses is done to test the robustness of each of the mean score differences (columns 1 and 2) after controlling on student differences at entrance.

First-Semester Experiences: LC—Non-LC Comparisons. Looking first at the simple mean comparisons between LC participation and nonparticipation, there are few differences between the LC and non-LC experience in the first category of interest, general social adjustment. While students in LC report greater institutional commitment, they report less exposure to racial/ethnic diversity (which coincides with the lower racial/ethnic diversity in the LC populations; Table 2). There are no significant differences in exposure to diversity in values or in ease of getting involved.

There are many more significant differences on the items reflective of academic integration, however. Students in LCs are significantly more likely to have contact with peers around academic work, engage in group projects, report positive academic behaviors, study more hours, perceive a positive learning environment, and have course assignments that require the integration of ideas. The amount of faculty contact, however, is not significantly different.

Because of the ongoing concern that the differences across LC status in students' entering college preparation and demographic characteristics might influence the comparative results, the effect of each LC category was tested after controlling on the set of entering characteristics. Enrollment in an LC has no significant relationship on any of the social adjustment variables once entering characteristics are held constant. However, it does have a significant positive effect on all of the academic integration variables (including faculty interaction, which did not show a significant mean difference). The consistency of the relationship between learning community status and this set of academic integration indicators provides additional support for the positive effect of LC involvement on this aspect of the student experience.

First-Semester Experiences: Comparisons Between LC Models. A central focus of this article is on the potential for variability in outcomes and experiences across the different LC models. The second column in Table 7 makes these mean comparisons regarding students' first-semester experiences.[3]

Among the general social adjustment items there are very few significant differences across the three LCs. The only significant difference is that Honors students report more exposure to students with different values than do students in the other two groups.

More differences among LC models emerge in the academic integration items. TAP students have higher means on both of the peer interaction items, and RAP students have lower means for both of the academic behavior items (but are still higher than the means for non-LC students). There are no statistically significant differences across the three groups in faculty contact and the two academic climate variables (positive learning environment and integration of ideas).

Because of the substantial differences in academic preparation and demographic characteristics across the three programs, I again tested the relationship between the three LC models and these experiential items after controlling on the same set of characteristics used in the other analyses. The third column in Table 7 provides a summary of the standardized coefficients for these analyses.

Controlling on entering preparation and student demographics does not change the conclusions one can draw from the comparison of means, although it further illuminates the role of the varying programs. With respect to the general social adjustment variables, TAP and RAP enrollment have a positive relationship with institutional commitment, and Honors enrollment has a positive relationship with exposure to diversity in values.

The relationships are stronger and more consistent across many variables on the academic integration items. All three LCs have a positive relationship with peer interaction, but the effect is particularly strong for TAP students. Similar patterns are found for engaging in group work, although in this case, Honors participation is not significant. As was true in the simple mean comparisons, there are no significant differences in faculty interaction. When it comes to

TABLE 7. First-Semester Experiences: Mean Responses and Beta Coefficients by Learning Community Affiliation

	2000 Cohort										
	Experience Scale Means							LC Effect Controlling on Student Entering Characteristics[1]			
		No LC (N = 328)	In a LC (N = 477)		TAP (N = 123)	RAP (N = 257)	Honors (N = 97)	In a LC (N = 477)	TAP (N = 123)	RAP (N = 257)	Honors (N = 97)
Survey Items	Sign. Diff.	Mean	Mean	Sign. Diff.	Mean	Mean	Mean	Std. B	Std. B	Std. B	Std. B
Overall Experience											
Level of Institutional Commitment	P = .012	3.39	3.49	ns	3.54	3.47	3.50	.071	.093**	.068*	.048
Social Integration Indicators											
Amount of Exposure to Racial/Ethnic Diversity	P = .047	3.65	3.50	ns	3.52	3.47	3.57	−.038	−.006	−.020	.026
Amount of Exposure to Diversity in Values	ns	3.32	3.39	P = .000	3.40	3.25	3.76*	−.033	−.019	−0.46	.106**
Ease of Getting Involved	ns	3.21	3.17	ns	3.16	3.19	3.15	−.017	−.024	−.005	−.049

Academic Integration Indicators											
Peer Interactions											
Extent of Academic Work with Peers	P = .000	2.82	3.24	P = .000	3.63*	3.12	3.10	.270**	.374**	.110**	.171**
Number of Times Worked on Group Projects	P = .000	2.09	2.44	P = .000	2.78*	2.35	2.23	.157**	.168**	.102**	.046
Amount of Faculty Contact	ns	1.59	1.91	ns	1.58	2.04	1.95	.091**	.020	.052	.066
Academic Behaviors											
Positive Academic Behaviors	P = .000	3.38	3.55	P = .049	3.59	3.50[a]	3.64[a]	.134**	.095**	.071*	.086*
Number of Hours Spent Studying	P = .000	10.90	12.95	P = .050	14.02[b]	12.15[b]	13.74	.139**	.160**	.093**	.127**
Academic Climate											
Experienced Positive Learning Environment	P = .000	2.58	2.72	ns	2.73	2.72	2.70	.119**	.107**	.081**	.057
Course Work Required Integration of Ideas	P = .000	2.90	3.21	ns	3.22	3.19	3.25	.125**	.116**	.016	.104**

*Indicates significant different ($p \leq .10$) between this LC mean and the other two LC means in posthoc pairwise t-tests.

[a]Significant difference between RAP and Honors LC & no-LC only.

[b]Significant difference between RAP and TAP & no LC only.

[1.]Coefficients show the LC enrollment effect (compared to no-LC) on each experience variable after controlling on Math and Verbal SAT, High School GPA, Gender, and Race/Ethnicity, Residency status, support program enrollment, and school/college affilitation.

*$p \leq .10$; **$p \leq .05$.

academic behaviors, all three LC models have a positive relationship with students' academic behaviors and the amount of time spent studying. These relationships are particularly strong for TAP enrollment. Finally, on the two academic climate variables, TAP enrollment has a significant positive relationship with both. RAP has a significant relationship with positive learning environment, but not integration of ideas, and Honors has the opposite pattern of results.

DISCUSSION

The central issue explored in this study is whether modestly constructed LCs can produce the type of positive outcomes and learning experiences that the more coordinated (and resource intensive) ones have shown in the growing research on LCs. As Fig. 1 demonstrated, the LCs evaluated here cluster on the Low Focus end on important dimensions of LC design. At the same time, however, there is variability among these three LCs on a few of the dimensions. Therefore, this study also explored the possible differences in outcomes and student experiences across these three slightly different models.

Outcomes: First-Semester Performance, One-Year Attrition (Voluntary and Required Withdrawal)

Across two cohorts of students, the results of this study support the notion that these more modest LCs produce the positive outcomes that the LC literature suggests and that institutions hope for when they develop LCs. All three LC models (which vary in admission criteria and some program design elements) have significant positive effects on first-semester academic performance (even after controlling on entering characteristics) and, to varying degrees across the two cohorts, on one-year retention.

Interestingly, these patterns are most consistent across cohorts and outcome variables for RAP, the LC that is the most modestly structured (and least selective) of the three on this campus (see Fig. 1). The consistency of significant effects as compared with more sporadic significance for the other two LC models may be driven in part by the larger number of students in RAP as compared with those in TAP or Honors. Indeed, in many models, the coefficients for the RAP and TAP program are similar in size although only RAP reaches statistical significance.

Where the unique contribution of RAP is most clear is in the model predicting *required* withdrawal (Table 6B). In this model, RAP alone has a strong effect, protecting students against the chances of required withdrawal. RAP is the only LC that is not selective in its admission policies, and its student population is most similar to the general university student population in academic preparation measures (see Table 2). As a result, students who are at academic risk are more

likely to be enrolled in RAP than in either of the other two LCs. The results in Table 6B suggest the promise of even a modest LC like RAP in helping the general student population avoid academic failure early in their college career.

Taken together, the analysis of outcomes shows that all of these LC models can have a positive effect on outcomes of importance to college and university faculty and administrators: academic performance and persistence. The suggestion from these results is that the general student population can benefit significantly from even relatively limited and uncoordinated LC efforts. This conclusion may be of particular importance to those who are charged with improving the educational experience for undergraduates on their campuses.

Experiences: Social and Academic Integration

In the second part of this study, the focus is on the quality of students' first semester experiences as reflected by measures of students' social and academic integration into the university. While the primary focus of this aspect of the study was students' academic integration experiences (the extent to which students become engaged in the academic life of the community and meld the academic elements with their social lives on campus), this part of the study also looked at their overall experience at the university and at specific elements of their social adjustment.

While the LCs studied here have limited and sporadic effects on overall experience and general social interactions, they have a strong and consistent relationships with all but one of the measures of academic integration (faculty interactions). The consistency and strength of these general relationships are particularly interesting given that all the students in this study (LC and non-LC) live in residence halls, where one might expect that the opportunity to integrate the academic and social lives of college may come naturally. However, these results seem to support Tinto et al.'s (1994) assertion that residence hall life may not support the integration of social and academic life, and in that environment, LCs (even modest ones) can offer a valuable service to students' academic life. The one weakness in these LC's ability to foster peer interaction is that students in an LC report fewer opportunities to interact with peers of a different race or ethnicity. This is linked to the relative lack of diversity in the LC enrollments, and is an area where additional attention to recruiting should be paid.

All three LC models have relatively similar effects on the academic integration variables, particularly in the analyses where entering characteristics are controlled. All three LC models show positive effects on at least one indicator of three of the four academic integration categories (peer interaction, academic behaviors, and academic climate). None shows a significant relationship with amount of faculty contact, however. Therefore, in broad terms, the three models foster similar academic integration experiences.

Within this general pattern of similar effects, there are two sets of differences across the models worth highlighting. First, students in the TAP program report significantly more peer interactions around academic work than students in either of the other two LCs. This makes sense given that TAP has more structured opportunities for student collaboration than the other two LCs, and that students in TAP share a common major (and common identity) and can more naturally work together in the major-related course (or courses) they take together.

The other significant difference across the LC models may be related to the differences in admission criteria for the three LCs. The means and coefficients for students in RAP are somewhat lower on the two measures of academic behavior, although they are still significantly different from those for students not in an LC. Therefore, while students in RAP may not put forth as much academic effort as those in TAP or Honors LC, the RAP environment still fosters greater effort in similar students than those not enrolled in any type of LC. Again, this shows the positive benefits of even the most humble LC model for improving the performance of the general student body.

As indicated earlier, among the academic integration variables, the only nonsignificant LC effect is with faculty contact. The mean comparisons show no significant difference and, while as a group LCs have a significant positive relationship with amount of faculty contact, there are no significant differences across the models. The fact that these three LC models have such strong other effects, even with more modest faculty involvement, is in conflict with some of the LC literature, which suggests that intensive faculty involvement is central to LC success.

At the same time, the results suggest that even these more modest LCs do provide increased opportunities for students to integrate their social and academic worlds around what Astin (1993) termed the "single most potent source of influence on growth and development during the undergraduate years" (p. 398): the student peer group. Both Astin and the LC literature generally highlight the importance of peer interaction around academic work in facilitating students' academic integration. The strong relationships between the various LC models and the measures of peer interaction indicate the important role LCs can play in enhancing this aspect of the student experience—even within a residential community environment.

CONCLUSION

The consistent positive effects of LC participation across a variety of outcome and experience measures provides compelling evidence that even relatively modest LCs, in residential environments, can provide a number of benefits to participants. The strength of the results is all the more interesting given that the LCs studied reflect the full complement of those administered on this campus—

not a select set that, as Tinto et al. (1994) indicated in their study, "best captured the intent of their program" (p. 3). In addition, these results take differences in student preparation, demographic characteristics, and other programmatic experiences into consideration and look at the LC effects across student cohorts. Taken together, these aspects of the study offer additional weight to the results and the conclusions that can be drawn from them.

These results clearly suggest that a variety of fairly humble LC models can have a number of positive effects on the first-year student experience. These positive effects are not limited to those models that are highly coordinated or have extensive faculty involvement, nor are they dependent on selective student enrollments. In fact, in this study, the LC model that was not selective, and was most often ranked in Fig. 1 as having a Low Focus on important LC dimensions, had the most consistently positive outcomes and, for the most part, fostered students' academic integration at levels similar to that of the other more selective and somewhat more coordinated, LC models. The fact that even simple structures that facilitate student interaction around academic work (even without coordinated faculty involvement) can have a positive effect for students of all preparation levels should provide encouragement to campus leaders working to develop methods for improving the undergraduate educational experience on their campuses.

APPENDIX A. Test of Multicollinearity

	1999 Cohort N = 3948		2000 Cohort N = 3580	
	TOL	VIF	TOL	VIF
High School GPA	.734	1.362	.706	1.416
Verbal SAT	.622	1.608	.567	1.763
Math SAT	.575	1.740	.541	1.847
Gender (1 = Female)	.848	1.180	.837	1.195
Support Program (1 = In a Special Program)	.542	1.845	.554	1.806
Residency Status (1 = Out of State Student)	.970	1.031	.970	1.031
Race/Ethnicity[a]				
African American/Cape Verdean	.682	1.465	.756	1.323
Hispanic	.839	1.192	.804	1.244
Asian	.785	1.275	.725	1.380
School/College Affiliation[b]				
Humanities/Social & Behavioral Sciences	.828	1.207	.816	1.225
Natural Science/Math/Engineering	.690	1.450	.695	1.439
Applied Majors	.768	1.302	.776	1.288
Arts and Sciences Pre-Majors	.771	1.298	.857	1.167
Residential Academic Program[c]				
TAP	.832	1.202	.827	1.209
RAP	.940	1.064	.898	1.113
Honors LC	.801	1.249	.797	1.254

[a]Reference group for Race/Ethnicity = White/Nonreporting Race/Ethnicity Students.
[b]Reference group for school/College Affiliation = Undeclared Majors.
[c]Reference group for Residential Academic Program = Students in No Program.

APPENDIX B: FIRST SEMESTER EXPERIENCE SURVEY ITEMS AND MEAN SCALES

General and Social Experiences

Level of Institutional Commitment (Scale, alpha reliability = .8027)
During this semester to what extent have you felt a sense of community at [this University]? (1 = To a very little extent, 5 = To a very great extent); How certain are you that you will return to [this University] next fall? (1 = Completely certain not to return, 5 = Completely certain to return); Do you think you made the right decision in choosing to attend [this University]? (1 = Definitely wrong decision, 5 = Definitely right decision); I fit in at [this University]. (1 = Strongly disagree, 4 = Strongly agree); How satisfied are you with your overall experience at [this University] so far? (1 = Very dissatisfied, 4 = Very satisfied);

Amount of Exposure to Racial/Ethnic Diversity (Single item): How often have you had serious coversations with students of a different race or ethnicity than you own? (1 = Never, 5 = Very often)

Amount of Exposure to Diversity in Values (Single Item) How often have you had serious conversations with other students whose beliefs, opinions, or values are very different than yours? (1 = Never, 5 = Very often)

Ease of Getting Involved (Single Item) How difficult has it been for you to get involved in extra-curricular activities at [this University]? (1 = Very difficult, 4 = Not at all difficult)

Academic Integration Indicators

Extent of academic work with peers (Scale, alpha reliability = .7855)
How many times have you worked on homework with another student or students? (1 = Never, 5 = Very often); How many times have you studied with another student or students for a test or exam? (1 = Never, 5 = Very often); How many times have you studied or worked on course work with other students who live in your residence hall? (1 = Never, 5 = Eleven or more times)

Number of Times Worked on Group Projects (Single Item) How many times have you participated in a group project for class? (1 = Never, 5 = Very often)

Amount of Faculty Contact (Scale, alpha reliability = .6165)
How many times have you discussed academic or intellectual issues with a professor outside of class?; How many times have you talked about your performance on tests or assignments with a professor?; How many times have you discussed your career plans and opportunities with a professor?; (Response scale = actual number of times reported)

Positive Academic Behaviors (Scale, alpha reliability = .5919)
At [this University], how often have you come to class well prepared to answer questions or engage in discussions? (1 = Never, 5 = Very often); At [this University], how often have you asked questions in class or contributed to class discussions? (1 = Never, 5 = Very often); How often have you discussed ideas from your classes with others outside of class? (1 = Never, 5 = Very often); I am having trouble figuring out how to succeed academically at [this University]. (1 = Agree strongly, 4 = Disagree strongly); I am confident that I can succeed academically at [this University]? (1 = Disagree strongly, 4 = Agree strongly)

Number of Hours Spent Studying (Single Item) On average, how many hours per week do you spend studying or doing homework? (Response scale = actual number of hours reported)

Experienced Positive Learning Environment (Scale, alpha reliability = .6957)
A lot of what I have learned in my courses at [this University] can be applied to the real world; Being at [this University] has helped me figure out how to develop my intellectual abilities; I know at least one professor at [this University] who is interested in my academic development; I feel very good about my learning experiences at [this University] so far; I have been intellectually stimulated this semester; At least one instructor at [this University] has inspired me to do better than I thought I could. (1 = Strongly disagree, 4 = Strongly agree)

Course Work Required Integration of Ideas (Single item) At [this University], how often have you worked on a paper or project where you had to integrate ideas from various sources? (1 = Never, 5 = Very often)

ENDNOTES

1. These same sets of variables are used as controls throughout the analyses presented here. While a number of these variables are interrelated, the Tolerance and Variance Inflation Factor values in the multicollinearity diagnostics are in the acceptable range (see Appendix A).

2. To interpret logistic regression results, look at the Odds Ratio [Exp (β)], where 1.00 means there is an even chance of staying enrolled and deviations from 1.00 indicate the increased (or decreased) chance of leaving. For example, for the 1999 cohort in Table 4, students in TAP are .333 (or 33.3%) less likely to leave after their first year (odds ratio of 1.00–.667).
3. The *p* value in this column indicates significant differences among the three LC models in a three-way ANOVA analysis. An asterisk next to one of the means indicates that, in post hoc pairwise *t* tests, this mean was significantly different from the other two LC model means and from the non-LC mean.

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