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ABSTRACT

This study focused on the degree to which the clusters established as part of a new general education system at the University of California, Los Angeles promoted an opportunity for increased academic integration for first-year students enrolled in the clusters as compared to first-year students in the typical general education curriculum. The cluster sequence was composed of a large lecture and 6 to 8 smaller (15 to 25 students) 2-hour discussion sections in the fall and winter quarters with a related seminar in the spring quarter. Cluster lectures were team taught to span academic divisions and to promote critical thinking. In the second year of the cluster program (first full year of operation), approximately 400 students were involved, a small portion of the undergraduate enrollment. Survey responses were received from 73 cluster and 108 noncluster students. Survey findings, which centered on seven variables, suggest that cluster participation had an impact on student outcomes, over and above other college experiences. The learning community cluster experience did help students begin to integrate into the college experience on a number of levels. Specific effects were seen on academic integration, quality of faculty interaction, and quality of interaction with peers in an academic setting. (Contains 1 figure, 8 tables, and 27 references.) (SLD)

General Education Clusters at UCLA: Their Impact on Students' Academic and Social Integration

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Poster presentation at AERA Annual Meeting 2001

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Introduction: Statement of the Problem and Its Significance

The University of California, Los Angeles began to examine its general education (GE) program in the 1994-1995 academic year. By June 1997 a report, *General Education at UCLA: A Proposal for Change*, was distributed to the UCLA campus, describing a proposed new general education system. Whereas previous GE courses were offered by individual departments and were determined by the available personnel and the need to attract students to majors, in the 1997-98 academic year the first three-quarter, freshman-level general education cluster course was offered as part of the pilot initiative. The GE initiative emphasizes sequential courses that are interdisciplinary and team-taught. The cluster sequence is comprised of a large lecture and six to eight small (15 to 25 student) two-hour discussion sections in the fall and winter quarters, followed by a small, related seminar during the spring quarter. The cluster's lectures are team-taught by four faculty during the first two quarters and the seminars are taught by one of the faculty or an advanced graduate student. The following year (1998-99) three more clusters were added to the curriculum (for a total of four). The students involved in the second year are of primary interest to this study.

The current UCLA Letters and Science GE curriculum mainly consists of single-quarter courses in one of four academic divisions. The clusters, in contrast, span across divisions as well as across quarters. The creators of the new GE initiative look forward to fostering a better education for the undergraduate students UCLA serves. One of the goals of this new GE curriculum is to create a structure to help students integrate more successfully into the institution.

This integration includes interaction with other students and faculty in an academic setting, as well as increased intellectual development. This particular study focuses on the degree to which clusters promote an opportunity for increased academic integration (Tinto, 1987) for the first-year students enrolled in the clusters as compared to first-year students enrolled in the typical general education curriculum.

The primary research question is whether **learning communities encourage a more coherent academic community of highly-prepared students through greater integration into the academic and social aspects of a large public research institution, such as UCLA**. In order to investigate this question, the conceptual framework of academic and social integration into the institutional environment described by Tinto (1987) is utilized. Using his more recent learning community model (1997), this research will determine the effect of UCLA's clusters on students' academic and social[1] integration into the institution.

Scholars of higher education have studied the general education curriculum by examining its influence on specific student outcomes such as basic skills, values, beliefs, satisfaction with college, critical thinking ability, personal habits, and citizenship (Boyer, 1987; Astin, 1992; Astin, 1993; Strong Foundations, 1994). However, these studies on general education curricula have not investigated the more recent introduction of the learning community structure. The general education cluster courses at UCLA fit the model of a "learning community" because the courses span an entire year, are interdisciplinary, and are designed specifically for first-year students. Additionally, clusters embody the goal of creating an academic community for undergraduates by providing academic and social networks for students (Shapiro & Levine, 1999).

Previous studies of learning communities have been limited by a number of factors. For example, much of the research on learning communities has taken place with students in community colleges or in four-year institutions that are more focused on teaching and learning and are not as research-oriented as the typical university (Tinto, Russo, & Kadel, 1994; Tinto, 1997; Shapiro & Levine, 1999). These studies therefore are not necessarily generalizable to large, urban, research institutions where faculty members' priorities lie more with their research. Even though many research universities claim to value undergraduate education and teaching, recruitment, promotion, and tenure practices give much more weight to research and scholarly publication than they do to undergraduate teaching (Astin, 1985). These values and practices limit the amount of time many faculty members spend with undergraduates and create a situation where faculty tend not to focus on teaching activities. Especially in large research universities, learning communities offer a way of rectifying the balance between teaching and research.

Most of the previous research is limited because: 1) it tends to be impressionistic and descriptive rather than quantitative; 2) is cross-sectional rather than longitudinal; 3) fails to control for pre-existing student differences; and 4) fails to use a control or comparison group of students who are not participating in a learning community.

Finally, even the few studies that have investigated student outcomes at institutions with a student body similar to UCLA's (Shaprio & Levine, 1999) have limited their outcome measures to GPA and retention rates rather than exploring involvement measures. Therefore, the question remains as to whether a learning community at an elite research institution , compared to the "distributional" course system traditionally used in general education, enhances the integration of freshmen students during their first year.

[1] The social integration aspect is very much a part of the academic integration. For purposes of this study, the social aspects of integration are those associated with academics (such as students studying together) as opposed to the

In part, this project will be of interest to researchers and practitioners in higher education because it examines the creation and impact of a learning community in a type of institution -- the large, public research university -- that has not historically given a high priority to undergraduate teaching and learning. This investigation will also be of interest to researchers who are trying to determine how and what curricular structures may or may not affect students' experiences in areas that higher education has claimed to be important. Additionally, faculty and administrators will be interested in this research because it will help them determine how to distribute resources when developing new curricula.

Perhaps most important, however, is this study's ability to help faculty who plan to organize and teach in learning communities understand how and why these structures succeed and/or fail in creating a student culture that is engaged in academic activities and places a high value on academic work.

Literature Review

In the recent past, general education courses have aimed to help students understand disciplinary content and develop students' academic abilities. The larger, goals of general education have been to 1) integrate general education knowledge to make it coherent and meaningful (Boyer, 1987; Strong foundations, 1994); 2) provide a strong foundation for students to enter a world where social responsibility is key (Smith, 1993; Strong foundations, 1994); 3) foster academic community (Strong foundations, 1994); and 4) continuously strive for educational coherence (Gaff, 1980; Garbowsky, 1995; Hepner, 1995; Higginbottom and Romano, 1995). This study of UCLA's general education initiative is couched in two areas of research: 1) the examination of the freshman year experience and 2) the success of learning communities.

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more purely social experiences (such as parties) of college.

Freshman Year Experience

Because clusters are typically offered during the freshman year, it is crucial to understand how the first year experience and its impact on students is depicted in the literature. Many higher education scholars view entry into college as a critical time of transition (Feldman & Newcomb, 1969; Baker, McNeil, & Siryk, 1985; Tinto, 1987; Upcraft & Gardner, 1989). Further, they believe that it is the institution's responsibility to try to ease this transition for students. Certainly, there are numerous ways an institution can help students adjust to the college environment: counseling programs, residential life activities and housing, and academic programs specifically designed for freshmen students. Freshman seminars are often used as a curricular tool to help students' academic transition into higher education. Usually the goal of these courses is "to introduce the student to the nature and value of a liberal education...[and] encourage...a positive attitude toward learning" (Gordon, 1989, p.192-193). In addition to these broad goals, freshmen seminars often help develop cognitive, writing, communication, and library skills as well as improve critical thinking and problem solving abilities either through a core curriculum course or an interdisciplinary course (Gordon, 1989). Furthermore, there is evidence that freshman seminars are associated with positive academic performance, faculty-student relationships, study habits, and communication skills (Fidler & Hunter, 1989).

Previous studies help us to understand how freshmen seminars can assist during this time of adjustment and integration. In one study, freshman year grade point averages (GPA) increased by an average of 0.71 for students participating in freshman seminars at Sacramento City College (Stupka, 1986, as cited in Upcraft, Gardner, et al., 1989). A second study at the State University of New York College at Cortland shows similar increases in GPA for students participating in freshman seminar courses (Hopkins & Hahn, 1986, as cited in Upcraft, Gardner, et al., 1989).

While GPA is often used as a measure of adjustment during the freshman year (Tinto, 1987; Upcraft, Gardner, et al., 1989), there are other ways to investigate freshman adjustment related to integration, or involvement. For example, studies at the State University of New York, Plattsburgh and the University of North Carolina, Charlotte show that participation in seminars increases faculty-student interaction (Woodward, 1982 and Tammi, 1987, as cited in Upcraft, Gardner, et al., 1989).

In short, research on the freshman year suggests 1) that it is important to get students immediately involved in their college experience; and 2) that freshman seminars appear to be an effective way to enhance involvement. The fact that UCLA's learning communities (i.e., clusters) are structured to meet many of the same goals to which freshmen seminars aspire suggests that learning communities may also be an effective means of enhancing achievement and encouraging student involvement during the freshman year.

Integration Defined as Involvement

Research suggests that involvement -- defined as "the amount of physical and psychological energy the student devotes to the academic experience" (Astin, 1985, p. 134) -- is a major mediating factor in learning and academic success (Astin, 1985; 1993). Involvement theory includes five basic postulates:

1) Involvement refers to the investment of physical and psychological energy in various objects ranging from the generalized student experience to the highly specific activity of preparing for an examination.
2) Involvement occurs along a continuum.

3) Involvement has both quantitative (e.g., how many hours does a student participate in studying) and qualitative features (e.g., how well does the student comprehend what he is reading).
4) The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program.
5) The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement (Astin, 1985, p. 135-136).

Astin analyzed several longitudinal databases on students (1977; 1993) and determined that "nearly all forms of student involvement are associated with greater-than-average changes in the characteristics of entering freshmen. And, for certain student outcomes, involvement is more strongly associated with change than either entering freshmen's characteristics or institutional characteristics" (Astin, 1985, p. 147). Based on Astin's findings, many other researchers have used involvement as a way of studying a variety of outcomes such as values, educational attainment, moral development, and subject matter competence, many of which are described in Pascarella and Terenzini's compilation of higher education research, *How College Affects Students* (1991). Tinto (1987, 1997) explores the impact of involvement in his departure model, however he calls it "integration." Integration (defined as involvement) therefore, appears to be critical to a successful college experience.

Many institutions of higher education are currently trying to incorporate the value of involvement into their academic programs. While a freshman seminar is one way to do this, a learning community appears to be a more comprehensive structure for accomplishing this goal.

Learning Communities

Some institutions have found learning communities to be an effective means for involving and integrating freshmen. Learning communities "purposefully restructure the curriculum to link together courses or course work so that students find greater coherence in what they are learning as well as increased intellectual interaction with faculty and fellow students" (Gabelnick, MacGregor, et al., 1990, p. 5). Learning communities are also one way to create a sense of group identity or cohesiveness among students, which Astin (1985) showed to be especially useful in large institutions to help combat a feeling of isolation.

Learning communities strive to provide: 1) students and faculty with a smaller group organization; 2) curricular integration; 3) academic and social support networks for students; 4) a setting whereby students can be socialized into the expectations of college; 5) an arena for faculty to come together in meaningful ways; 6) a place where faculty and students can focus on learning outcomes; 7) a setting for delivery of academic support programs; and 8) an opportunity to examine the first-year experience (Shapiro & Levine, 1999, p. 3). Items number 3 and 4 (above) -- "Academic and social support network for students" and "a setting whereby students can be socialized into the expectations of college" -- are the most crucial for this particular study because they relate to how students become academically integrated and to what extent students are engaged.

Gabelnick, MacGregor, et al. (1990) placed learning communities into one of five models. First is the *linked course* model, which requires that two existing courses be paired up by listing them in the class schedule so that a cohort of students signs up for both courses. This model often involves about 25 students and focuses on the shared experience of the enrollment in two courses and the reinforcement of the skills and content between the courses.

The second model is the *freshman interest groups,* which links courses by pre-major topics and has a peer advising component. Freshman interest groups are geared toward creating a support system for first-year students but do not require that faculty engage in any co-planning; rather, the connection is made through advising rather than academics.

The third model is known as *federated learning communities,* which aims to build coherence and community for its students. These communities usually include up to forty students who co-register and travel as a small group within larger courses that are connected by an overarching theme. Students also enroll, as a group, in a discussion section related to the lectures.

Gabelnick, MacGregor, et al. (1990) identify their fourth model as *coordinated studies*, which requires that the same students enroll as a group for their entire curricular program for one or more quarters or semesters. This model includes the interdisciplinary approach and focuses on active learning around particular themes, much the same as UCLA's clusters. However, unlike the coordinated studies model, UCLA students are also engaged in other course work during their cluster experience.

The fifth model, which is called a *learning cluster,* requires that three or four existing courses be linked over the course of a given quarter, semester, or year. The learning focuses on the shared experiences of enrollment in multiple courses and reinforcement of skills and content among the courses. This model most closely resembles UCLA's model, except that the learning cluster model can consist of discrete courses, rather than new courses created by groups of faculty to be team-taught that focus on interdisciplinary material. Additionally, learning clusters usually involve only 25-30 students, while UCLA's clusters enroll approximately 120 to 160 students in each course.

All five models incorporate many of the goals of learning communities (Shapiro & Levine, 1999), but each model is a little bit different and a learning community at a particular institution may not necessarily fit perfectly into any one of the categories described above. This absence of "standardization" creates a very practical problem for research, given that the findings from "similar" programs may vary from one institution to another for reasons that are not always clear.

Student Involvement

As already suggested, since student involvement is the key to academic and social integration, learning communities are important because they represent a potentially effective means for encouraging student involvement. While the main purpose of the clusters is to strengthen the academic culture, they also have potential to enhance the social aspects of integration into college life. This incorporation of both academic and social integration is thus one of the advantages of a learning community (Tinto, 1997). Not only do students have the opportunity to get involved and become interested in particular ideas and learning, but they also affiliate with the same group of peers and instructors throughout the first year, which may well add a social component. Academic involvement, it should be added, tends to increase satisfaction with most aspects of college (Astin, 1993). There are certainly other social aspects of learning communities that should be explored. However, for purposes of this study, exploration of social activities will be limited to those activities that fall under the auspices of an academic experience.

Tinto has created a new theoretical model, based on his earlier student departure model that incorporates learning communities (1997). The model highlights the overlap between the academic and social systems in learning communities and, in addition to integration, incorporates quality of student effort. The combination of integration and quality of student effort are essentially the same thing as involvement. This modification to his earlier model grew out of his study of learning communities at a commuter institution, where he viewed these communities as "at least one way to make involvement matter in an urban community college setting" (Tinto, 1997). Using a modified version of Pace's Quality of Effort Scales (Pace, 1984) in a longitudinal survey instrument, Tinto found that students involved in the learning community reported "greater involvement in a range of academic and social activities" (Tinto, 1997, p. 606) over the course of the year. This finding held especially true in the case of academic activities and projects involving other students. These findings, however, were purely descriptive. Tinto did not statistically control either for input variables or for other environmental variables when investigating the differences in involvement measures between learning community students and the control group. While Tinto did perform some multivariate analyses, these analyses focused on persistence rather than involvement measures as dependent variables.

Retention and GPA

Many other studies that investigate the impact of learning communities on retention show that students are more likely to remain in college and become involved if they participate in a learning community (Borden & Rooney, 1998; Gabelnick, MacGregor et al., 1990; Shapiro & Levine, 1999; Tinto, 1997; Tinto, Russo, & Kadel, 1994). These studies also show an increase in GPA (similar to those studies of freshman seminars) for learning community participants. While these are important findings about learning communities, none of them investigated institutions like UCLA, which have very high retention rates and award generally high GPAs. Retention and college GPA, in other words, are not necessarily the main areas of interest when investigating the impact of a learning community in a highly selective institution such as UCLA.

Other Academic Outcomes

Although there are some institutional evaluation studies that begin to look at academic outcomes other than GPA and retention, most of these are technical reports that have not been published in peer reviewed journals. Some of these studies have been briefly reported in books on learning communities. Some typical examples include: in a study of the development of intellectual skills at Daytona Beach Community College, the Washington Center for Improving the Quality of Undergraduate Education found that students in learning communities "made a significant and unusual leap in intellectual development" (Gabelnick, MacGregor et al., 1990, p. 66); and scholars at the University of Maryland, using the Measure of Intellectual Development to assess students' placement on the Perry Scheme of Development, found that students in learning communities showed greater movement along Perry's scales than other students did (Shapiro & Levine, 1999). These studies show that learning communities may have an impact on students' intellectual development. However, they do not use longitudinal measures, nor do they control for possible pre-existing differences between the learning community students and the control group.

Another study, which took place at the University of Wisconsin, reported that students involved in the Bradley Learning Community expressed greater levels of satisfaction with their first-year experience, were more likely to seek assistance from their peer learning partners, and were more likely to contact faculty than were those not participating in the learning community (Shapiro & Levine, 1999). However, this study has similar shortcomings in that it did not use longitudinal measures and did not control for possible pre-existing differences between the learning community students and the control group.

While these studies are not conclusive, they do point to some areas of interest, such as intellectual gains in writing ability and critical thinking, peer interaction, and student-faculty interaction, all of which will be investigated in this study.

Qualitative research has also explored issues of involvement that are relevant to this research. For example, research conducted at Temple University revealed that students participating in learning communities began to "see their peers as partners in the learning process" (Shapiro & Levine, 1999, p. 175). Other qualitative studies show a similar sense of peer interaction and sense of belonging as the result of participation in learning communities (Gabelnick, MacGregor, et al., 1990).

Tinto & Goodsell (1994) published a study that confirms many of the findings compiled in the books on learning communities. This particular study investigated freshman interest groups (FIGs) -- comprised of 20 students -- through participant observation and interviews at a research university with an open admission policy. These twenty students in the FIG, who took three courses together around a unifying theme, were also enrolled together in a writing "link" course and a quiz section as part of the larger lecture courses. Additionally, the FIG students met together weekly with a peer advisor. Qualitative data prompted the researchers to conclude that both academic and social experiences enhanced students' first-year experience. For example, students were able to form social networks with other FIG students because they were constantly in contact with one another. Also, the writing class engaged the FIG students on an intellectual level through the peer review writing process. FIGs were also viewed as support groups where students felt "less anonymous." Finally, students felt comfortable forming study groups with other FIG students. These findings suggest that learning communities may influence students in the research university and other institutions in similar ways, however, the qualitative nature of this research and the lack of a comparison group make it difficult to draw any definitive conclusions.

In summary, previous studies have concentrated on students who are considered "at risk" (Tinto, 1997; Tinto, Russo, & Kadel, 1998; Shapiro & Levine, 1999), a population which is very different from the cluster-student population at UCLA and other highly selective institutions. Students at more elite institutions such as UCLA tend to be better prepared, as revealed in their high SAT scores and high school grade point averages. Further, institutions with a well-prepared student body as well as a strong research orientation are markedly different from less selective liberal arts colleges and other four-year institutions and community colleges, not only in the characteristics of their students but also in their educational environments. Therefore, this study will help shed some light on the applicability of previous findings to highly selective research institutions.

Some of the previous studies also have methodological shortcomings. First, whereas many studies on learning communities are somewhat impressionistic (e.g., Gabelnick, MacGregor, et al., 1990; Tinto & Goodsell, 1994; Tinto, Russo, & Kadel, 1994; Tinto, 1997; Shapiro & Levine, 1999), quantitative studies such as the one proposed here are more generalizable and more easily replicated. Second, most of the earlier studies are not longitudinal (e.g., Gabelnick, MacGregor, et al., 1990; Shapiro & Levine, 1999), which limits their ability to determine whether any change took place. Third, most of the previous studies (Gabelnick, MacGregor, et al., 1990; Tinto & Goodsell, 1994; Tinto, 1997; Borden & Rooney, 1998; Shapiro & Levine, 1999) fail to control for pre-existing differences, especially pre-tests on dependent variables, which limit their ability to determine whether the learning community was responsible for the observed outcome. Fourth, many of the studies (Gabelnick, MacGregor, et al., 1990;

Tinto & Goodsell, 1994; Shapiro & Levine, 1999) fail to include a control or comparison group, which makes it difficult to know whether something else besides time and maturity might account for particular changes in the students.

Finally, even the few studies that have investigated student outcomes at institutions with a student body similar to UCLA's (Shapiro & Levine, 1999) have limited their outcome measures to GPA and retention rates rather than exploring involvement measures. Therefore, the question remains as to whether a learning community at an elite research institution can significantly enhance the academic integration of highly-prepared students during their first year in college.

Conceptual Framework and Research Question

In order to understand how UCLA's learning communities influence the integration of students into the collegiate environment, Tinto's model linking classrooms, learning, and persistence[2] (1997) is applied. This particular study does not purport to investigate whether the students ultimately graduate or drop out of college, but rather how curricular structures aid the process of academic and social integration into the institution.

Tinto (1987) theorizes that students enter college with a set of "pre-entry attributes" which include family background, skills and abilities, and prior schooling. All of these attributes influence a student's goals and commitments to a particular institution of higher education, which in turn influence the types of institutional activities and experiences in which students choose to engage, such as a GE cluster in this instance. According to Tinto (1987, 1997), activities in which a student participates influences the students' integration both academically and socially.

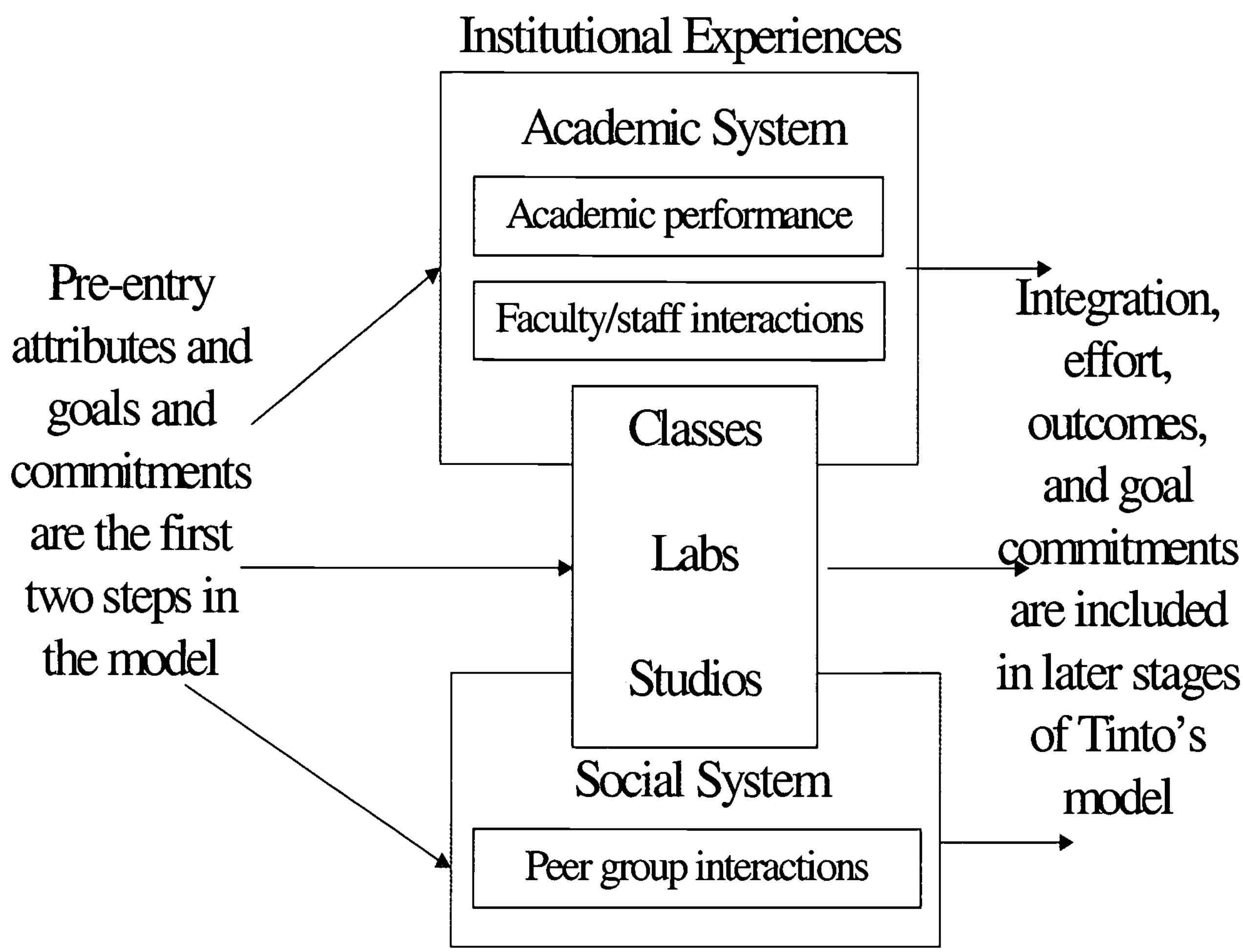
[2] This is a revised version of Tinto's departure model (1987).

In the current study, there is some consistency in the pre-entry attributes, especially in the skills and abilities area since students applying to UCLA are very competitive and only the most academically prepared students are admitted. Yet, even with the rigorous admissions standards applied, there is still some variation in entering students that must be controlled. Additionally, there may be very different sets of previous activities and expectations about the institution among students that may impact the choices they make about getting involved in numerous activities on campus, including cluster participation. Once these variables have been controlled, the study is designed to examine both faculty and peer group interaction as well as academic performance, which spans both the academic and social systems in Tinto's model (see Figure 1). In Tinto's previous work (1987), he also focuses on participation in extracurricular activities, however this study will not examine this are as it is less related to potential cluster experiences. For the purposes of this research, the other three aspects of this model (i.e., academic performance, faculty/staff interactions, and peer group interactions) will determine students' level of integration. The first two areas fall under the "academic system," while the third area falls under "Social System" in Tinto's model.

The overarching question in this study is: **How does a learning community (i.e., GE cluster courses) influence students' academic and social integration during their first year?**

When the general education cluster courses were first introduced to UCLA's freshmen, the participating faculty and administrators had certain goals in mind: 1) an increase in students' academic skills such as critical thinking; 2) increased contact with faculty and contact that is of a higher quality; and 3) increased time spent with peers from class, especially in an academic capacity.

Figure 1: Key Component of Tinto's Model Linking Classrooms, Learning, and Persistence



The guiding hypothesis of this study is that after controlling for differences in student characteristics and experiences prior to college entry, the clusters will have a positive impact on students' integration into the college environment, especially in the academic arena.

Methodology

Sample and Data Collection

This study was conducted at the University of California, Los Angeles, a large, highly selective, urban, public research university. This institution has an ethnically diverse student body comprised of approximately 24,000 highly selected undergraduates. The institution follows a quarter system, which consists of three ten-week quarters in an academic year. Each of the four general education cluster courses spans all three quarters and includes about 100 students, making a total of approximately 400 students across four clusters (only a very small fraction -- less than two percent -- of the current undergraduates).

During summer orientation all of UCLA's freshmen are given the Freshman Survey, which is created and distributed by the Cooperative Institutional Research Program (CIRP), sponsored by the Higher Education Research Institute (HERI) at UCLA. This study will investigate outcomes for first-year students in the first full year of cluster offerings -- the 1998-1999 Academic Year -- using merged longitudinal data from the CIRP Freshman Survey and follow-up survey (i.e., the College Student Survey – the CSS).

These surveys are part of a much larger national administration. CIRP has been conducting annual surveys of college freshmen since 1966 using the Freshman Survey, and has conducted longitudinal follow-up studies of many of those cohorts. Over the years they have surveyed over 10 million students across 1,700 institutions. The Freshman Survey includes information on students' personal and demographic characteristics, high school experiences, expectations about college, as well as values, attitudes, goals, self-concepts, and career aspirations. The College Student Survey asks students about their experiences in and perceptions of college. Additionally, the CSS provides a post-test for items on the Freshman Survey, asks them to reflect on their values, attitudes, goals, self-concepts, and career aspirations.

The Freshman Survey was administered prior to classes commencing in the fall quarter. Students completed the survey in a controlled environment during freshman orientation. The follow-up survey (CSS) was administered at the end of their first year via direct mail. The CSS was sent to all cluster participants as well as comparison groups of non-cluster students who were matched to cluster students on high school GPA, SAT scores, and gender. These particular matching variables were selected to ensure that cluster students were not more well prepared (as defined by GPA and SAT scores) than the non-cluster students and so there would not be a significant gender imbalance between the groups.

At the end of the freshman year, two rounds of the follow-up survey were sent out. The first round was sent to students' local addresses in the eighth week of the Spring Quarter, 1999. The second round was sent to their permanent addresses three weeks after the quarter had ended. In this initial year of data collection, a smaller number of participants responded than hoped (see Table 1), however future data collection will focus on securing a higher response rate.

Table 1: Response rates

	Cluster (N=400)	**Non-cluster (N=400)**	**Total (N=800)**
Number of returned surveys	73	108	181
Response rate %	18%	27%	24%

Since the clusters are new to UCLA, there is a great deal of assessment work around them, including other surveys of cluster students (although the other surveys do not compare cluster students to non-cluster students). It is possible that cluster students felt a bit "over-surveyed" as compared to non-cluster students, which might explain the difference in response rate.

Research Methods

The analysis utilized the Input-Environment-Outcome (I-E-O) framework developed by Alexander Astin (1993). This methodological framework posits that characteristics students possess prior to the college experience (input) are related to the institutional experiences (environment) in which the student chooses to engage and the outcomes of that experience. Therefore, in order to assess the impact of a certain college environment or experiences (in this case participation in a cluster course) on student outcomes, the influence of input characteristics on the outcome measure must first be controlled. In addition to the input characteristics, the researcher must also control for the influence of any environmental effects in addition to the primary variable of interest that may impact the outcome measure. Tinto uses a similar theory, however he uses slightly different terminology. Tinto (1987) calls the input characteristics "pre-entry attributes" and "goals/commitments" and the environmental variables "institutional experiences."

Forward, stepwise regression analysis was conducted in which temporally ordered "blocks" of independent variables were entered (Pedhazur and Schmelikin, 1991; Astin, 1993; Pedhazur, 1997). Mean scores of the sample were substituted for any missing data in order to retain all cases. Within each block, those variables significant at $p<.05$ entered the equation in a stepwise fashion. By utilizing stepwise regression, the influence of each variable may be traced as all others are controlled through the regression. It is also possible to trace the potential effects of those variables that do not enter the equation by analyzing the standardized regression coefficient (or beta coefficients). Additionally, issues of multicollinearity were scrutinized to ensure that each entering variable actually added to the predictive value of the regression equations.

In this particular study, the I-E-O model enables the researcher to assess whether the environmental factor of participating in a learning community (i.e., cluster) has an effect on students' academic and/or social integration, after controlling for input characteristics.

Variables

Dependent Variables

This study investigates seven specific dependent variables based on the goals of the cluster courses as well as on Tinto's model (1987; 1997). The seven variables can be categorized under three major areas: 1) change in academic outcomes; 2) level of faculty interaction; and 3) level of peer interaction.

Academic outcomes include **change in reading speed/comprehension** and **change in critical thinking ability**. Faculty interaction outcomes include **hours per week talking with faculty outside of class** and **faculty provided intellectual challenge/stimulation**. Peer interaction outcomes include **frequency of discussing course content with students, frequency of participation in a group project in class,** and **frequency of discussing politics**. (For coding schemes see Appendix.)

Independent variables

Each of the seven regression equations had four temporally ordered blocks: 1) students' personal background characteristics; 2) students' high school experiences and accomplishments as well as anticipated college experiences; 3) actual college experiences in the freshman year; and 4) the cluster experience.

Each regression equation controlled for a slightly different set of independent variables, determined, in part, by the dependent variable of interest. Block one was the same in all regressions and included the following student characteristics: gender, father's education, and mother's education. Block two was similar in each regression equation and included the variables relating to high school experiences and accomplishments as well as expectations of college. Examples include high school grade point average, SAT scores, planning to live on campus, degree aspirations, choice of major, and any appropriate pretest or proxy pretest variables. The third block controlled for collegiate experiences known to affect the dependent variable as based on previous research; zero order correlations with the dependent variable were also examined in selecting the appropriate variables. Some additional variables were also employed for exploratory purposes. (For a list of variables in each block and each regression, see Appendix.)

The fourth, and final, block included the key independent variable: a dichotomous variable measuring cluster participation. This variable being the primary variable of interest for this study was entered only after controlling for all of the other independent variables that might influence the outcome measure.

Results and Discussion

As mentioned in the Dependent Variable section, the regression equations performed for this study can be broken up into three areas. Academic integration is measured based on self assessments of "changes in reading speed/comprehension" and "changes in critical thinking ability." Faculty interaction is measured by the "hours per week students spent talking to faculty outside of class" and whether or not "faculty provided intellectual challenge/stimulation." Finally, peer interaction is measured by the "frequency students discussed course content with other students," the "frequency with which students participated in a group project in class," and the "frequency students discussed politics."

Academic Integration

Table 2 shows the variables that impact **reading speed/comprehension** (rated on a five-point scale from "much stronger" to "much weaker") after controlling for input characteristics and other environmental experiences. (See the Appendix for the coding scheme for all variables.) Prior to cluster participation entering the regression equation, "composite SAT score" and "hours per week studying or doing homework" enter. The SAT score negatively predicts reading speed/comprehension. Because SAT scores measure (in part) reading ability, it is quite reasonable that students with lower SAT scores were the ones who felt that they had improved their reading speed and comprehension over the course of their first year. The second variable, which positively predicts, shows that the more hours per week a student spends studying or doing homework, the more likely the student is to rate him/herself as having improved in reading speed/comprehension. This too makes sense since spending more time reading (which is part of studying and doing homework) should increase both speed and ability to comprehend reading material.

Even after controlling for the above variables and input characteristics, participation in a cluster tends to cause an increase in students' self-rated reading speed and/or comprehension. Part of this can be explained by the hours per week students in clusters spend on homework/studying. This tendency can be observed in the beta change (from .22 to .20) after step three when cluster participation enters. Additionally, cluster participation has some unique, statistically significant contribution to the regression equation. While the variables in the equation can not help explain this impact, it is possible that the type of reading material in which the cluster students engage (i.e., interdisciplinary) in may influence their perception that their reading speed/comprehension has improved over the course of their first year.

Table 2: Self-rated Change in Reading Speed/Comprehension (N=181)

				Beta after step		
Step	Variable	R	simple r	1	2	3
1	composite SAT score	18	-18	-18*	-18*	-18*
2	HPW studying/homework	28	22	22**	22**	20**
3	Cluster participation	36	23	23***	21**	21**

Source: UCLA Higher Education Research Institute, Cooperative Institutional Research Program

* p<.05, **p<.01, ***p<.001

Note: Decimals before numbers have been omitted. R-square = .13

Table 3 investigates **students' self-rated change in critical thinking ability**, rated on a five-point scale from "much stronger" to "much weaker." The only statistically significant variable to enter this equation is "discussed course content with students." In other words, discussing course content with other students often makes students more likely to feel that their critical thinking skills improve. It may be that by discussing ideas and concepts (as opposed to memorizing facts for a test) students' critical thinking skills are raised (Kurfiss, 1988).

However, it is surprising that cluster participation does not enter the equation at a statistically significant level. Previous research indicates that a curriculum experience that advocates the integration of ideas and disciplines should enhance critical thinking (Winter, McClelland, and Stewart, 1981 in Pascarella and Terenzini, 1991). Astin (1993) also found that an interdisciplinary emphasis (among other things) should increase students' critical thinking skills. Since the cluster experience is supposed to be one that integrates ideas across the disciplines, it is reasonable to expect that critical thinking skills would improve. The explanation for this finding is that it may be too difficult for students to assess their own critical thinking skills after only nine months in college. Therefore, this outcome variable should be reassessed at a later time, perhaps after students have completed their undergraduate education.

It is somewhat surprising that "studying with other students" (with a zero order correlation of .17) did not enter the equation, but that particular variable is highly correlated (.33) with "discussed course content with students" and therefore was potentially kept from entering by the variable that was more highly correlated with the outcome measure.

Table 3: Self-rated Change in Critical Thinking Ability (N=181)

				Beta after step	
Step	Variable	R	simple r	1	2
1	Discussed course content with students	25	25	25***	24***
2	Cluster participation	27	14	12	12

Source: UCLA Higher Education Research Institute, Cooperative Institutional Research Program
* p<.05, **p<.01, ***p<.001
Note: Decimals before numbers have been omitted. R-square = .07

Looking at both of these academic variables together it appears that cluster participation may help explain some academic growth for first-year students, particularly with regard to reading speed/comprehension, beyond what the college experience can provide without the cluster experience. It can also be said that students may not yet be able to evaluate a deep change in their academic abilities after only one year.

Faculty Interaction

The second area of analysis investigated interaction with faculty. Table 4 shows only one variable entering the regression equation at a statistically significant level for the dependent variable "**hours per week talking with faculty outside of class**" (rated on an eight-point scale ranging from "none" to "over 20"). The variable that entered was "SAT composite." It is a bit puzzling, however, that SAT score would have a negative relationship to the dependent variable. This means that the higher the SAT score, the less likely students are to talk to faculty outside of class. Perhaps this is because students with higher SAT scores are more confident and therefore the less likely to feel the need to seek out faculty for help.

The fact that the cluster variable was forced into the equation (and did not carry significant weight) indicates that participation in a cluster does not affect students' talking outside of class with faculty.

Table 4: Hours per Week Talking with Faculty Outside of Class (N=181)

				Beta after step	
Step	Variable	R	simple r	1	2
1	SAT composite	20	-20	-20**	-20**
2	Cluster participation	22	07	07	07

Source: UCLA Higher Education Research Institute, Cooperative Institutional Research Program
* p<.05, **p<.01, ***p<.001
Note: Decimals before numbers have been omitted. R-square = .05

Even though the college environment does not seem to affect how often students talk with faculty outside of class, the environment does seem to have some impact on the level at which students feel that faculty are intellectually stimulating and/or challenging (see Table 5). The dependent variable, **faculty are intellectually challenging/stimulating**, is a dichotomous variable.

The first two variables that enter the regression equation are "mother's education level" and "self-rated academic ability." The higher the mother's educational level, the more likely students are to feel that faculty provided intellectual challenge/stimulation. Mother's education level is correlated with living on campus (r=.248). Students who are living on campus are more likely to get involved than commuting students (Astin, 1993). This involvement may include engagement with faculty that might make the students feel more intellectually challenged. Students who rated themselves higher in academic ability (as measured on the follow-up survey) were more likely to feel that the faculty provided them with intellectual challenge and/or stimulation. It is more difficult to attribute cause with this particular variable since academic ability and the dependent variable were measured at the same time. The one thing that can be said here is that students who rate themselves as having higher academic ability also find that the faculty provide intellectual challenge and/or stimulation. Perhaps those who feel they had higher academic ability were more likely to seek out opportunities for the faculty to challenge them. Or, perhaps the opposite is the case - that students who felt that faculty provided intellectual challenge/stimulation were more likely to rate themselves as having higher academic ability.

At step three "cluster participation" enters as statistically significant. This means that participation in a cluster, over and above input characteristics and other environmental variables, tends to make students feel that faculty have provided them with intellectual challenge/stimulation. After controlling for "change in academic ability," the beta for "cluster participation" increases (from .19 to .21). This means that there is a suppressor effect. The variable "cluster participation" and the variable "self-rated academic ability" are negatively correlated (r=-.10) with one another and both are positively correlated with the dependent variable. This in turn means that after controlling for participation in a cluster, students are actually <u>more</u> likely to rate themselves as having higher academic ability.

It was rather surprising that talking with a faculty member outside of class did not enter the equation and was actually negatively associated with students feeling that faculty provided them with intellectual challenge/stimulation. This may indicate that specifically in-class activities cause students to feel challenged by their faculty, rather than activities outside the classroom.

Table 5: Faculty provided intellectual challenge/stimulation (N=181)

				Beta after step		
Step	Variable	R	simple r	1	2	3
1	Mother's education	21	21	21**	18*	15*
2	Change in academic ability (Follow-up Survey)	26	19	16*	16*	18*
3	Cluster participation	34	22	19**	21**	21**

Source: UCLA Higher Education Research Institute, Cooperative Institutional Research Program
* p<.05, **p<.01, ***p<.001
Note: Decimals before numbers have been omitted. R-square = .11

Overall, it appears that cluster participation affects students perception about the quality of faculty-student interaction through intellectual challenge/stimulation. However, it does not help predict the quantity of faculty-student interaction, or hours per week talking to faculty outside of class.

Peer Interaction

The final area of analysis relates to peer interaction. The first regression equation explores the **frequency with which students discuss course content with other students** (rated on a three-point scale from "frequently" to not at all"). Three variables enter. The first is "majoring in the physical sciences," which negatively predicts discussing course content with other students. This may be a function of possible competitiveness among physical science majors, especially in the first year, or it could be the result of the kind of courses that are very factual and therefore not particularly conducive to discussion. The second variable entering the equation is "studied with other students." This is perfectly reasonable since students who study together are more likely to be discussing course content with one another. The final variable entering this equation is "worked on a group project in class." This variable also makes sense as a predictor since students who are working on a group project are required to discuss the project with one another (which certainly has to do with course content).

After controlling for input characteristics and other environmental variables, participation in a cluster did not help predict how often students discussed course content with other students. However, the degree to which students studied with other students and how often they worked on group projects in class both influenced their frequency of discussing course content with other students, as seen in Table 6. By looking at the variables that did not enter, specifically the "cluster participation" variable, it is possible to see how the variables in step two and three impact cluster participation. The beta decreases only slightly (from .07 to .06 after step two) when "studied with other students" enters, but it goes down a bit more (from .06 to .03 after step three) when "worked on a group project" enters the regression equation. This means that the possible impact of cluster participation is mediated through the other two environmental variables. In other words, since cluster participation encourages students to work on group projects and study with other students, it indirectly affects the frequency with which students discuss course content with other students.

Table 6: Frequency of Discussing Course Content with Students (N=181)

				Beta after step		
Step	Variable	R	simple r	1	2	3
1	Physical Science major	31	-31	-31***	-26***	-25***
2	Studied with other students	42	33	29***	29***	25***
3	Worked on a group project in class	45	25	22**	17**	17**
4	Cluster participation	45	09	07	06	03

Source: UCLA Higher Education Research Institute, Cooperative Institutional Research Program

* p<.05, **p<.01, ***p<.001

Note: Decimals before numbers have been omitted. R-square = .20

The next regression analysis examined the impact of the cluster on the **frequency of participation in group projects** (rated on a three-point scale from "frequently" to "not at all") (Table 7). The first variable to enter is "studied with other students." Perhaps this is the case because students who study with other students are comfortable working in groups and may be more inclined to opt for more formal group projects when given the choice. Alternatively, students who work on group projects may have more opportunities for studying with other students.

The second variable to enter the regression equation is "cluster participation." The zero-order correlation between cluster participation and the dependent variable (.23) is almost as strong as the zero-order correlation of the first variable and the dependent variable (.24). The multiple R is also raised .10 in step two, after "cluster participation" enters. This means that cluster participation has a strong statistical effect on the frequency with which students participate in group projects. This may be because the cluster courses are more likely to require, or perhaps offer, opportunities to participate in group projects compared to other general education courses that students take in their first year. It may be that faculty who teach in cluster courses, since they have these students for three quarters (instead of just one), may feel that they have had enough opportunity to evaluate students individually and thus feel more comfortable offering group work as part of their assessment of student performance.

Table 7: Frequency of Participation in a Group Project in Class (N=181)

				Beta after step	
Step	Variable	R	simple r	1	2
1	Studied with other students	23	24	23**	22**
2	Cluster participation	33	23	24***	24***

Source: UCLA Higher Education Research Institute, Cooperative Institutional Research Program
* p<.05, **p<.01, ***p<.001
Note: Decimals before numbers have been omitted. R-square = .11

Table 8 presents the results of the regression with the dependent variable "**frequency of discussing politics**" (rated on a three-point scale from "frequently" to "not at all"). In this particular regression equation, after controlling for input characteristics, and variables that suggest a predisposition for political concern/activism, a few other variables enter into the regression equation significantly. The second variable to enter is "majoring in physical science." This variable has a negative relationship to discussing politics. Perhaps this is because people who are majoring in the physical sciences are less likely to discuss course content with other students (r=-.305) and therefore may be less likely to discuss anything with fellow students. The third variable to enter is "work on a political campaign." Not surprising since those discussing politics will be more likely to work on political campaigns. Also such work may increase their interest in politics which gets reflected in how often they like to discuss politics. The fourth variable to enter is "work on a group project in class." This variable has a less obvious connection to discussing politics. Perhaps students who are engaged in group projects and active learning, who are already discussing academic, or intellectual, topics such as the course content, are more likely to also discuss other non-course-related issues such as politics that are of an "intellectual" nature. Discussing politics might be considered much more of an intellectual pursuit than discussing the latest prime time situation comedy, for instance. The next variable to enter the equation is "participate in a demonstration," which is another activity that is likely to attract people who discuss politics often.

Finally, the "cluster participation" variable is forced in at the last step. It is already known (Table 7) that participation in a cluster helps to predict the frequency with which student participate in group projects. This can be observed again in the regression depicted in Table 8. The statistical significance which "cluster participation" has on the frequency of discussing politics is mediated by the variable "work on a group project." From this, if the reader believes the argument made about group activities in academic settings promoting more intellectual discussions (and that politics can be considered intellectual) then cluster participation may stimulate this sort of discussion through the group project activities.

Table 8: Frequency of Discussing Politics (N=181)

				Beta after step					
Step	Variable	R	simple r	1	2	3	4	5	6
1	Keep up to date with politics (SIF)	39	39	39***	39***	35***	34***	34***	33***
2	Major: physical science	43	-19	-19**	-19**	-18**	-16*	-18**	-18**
3	Work in political campaign	48	29	22***	22**	22**	20**	16*	15**
4	Work on a group project in class	52	25	23***	21**	19**	19**	18**	16*
5	Participate in a demonstration	54	21	19**	21**	16*	15*	15*	15*
6	Cluster participation	55	20	18**	17*	15*	11	11	11

Source: UCLA Higher Education Research Institute, Cooperative Institutional Research Program

* p<.05, **p<.01, ***p<.001

Note: Decimals before numbers have been omitted. R-square = .30

Tables 7 and 8 together show that cluster participation causes students to interact more with their peers through group work, which in turn may actually stimulate intellectual discussions. Further, cluster participation encourages these students to engage in active learning by discussing issues with one another and by working on projects together.

Limitations

A few limitations to this study must be recognized. First, the cluster program at UCLA is in it's infancy and results may only be considered preliminary. As the program matures and becomes more robust, further analysis will determine whether the current findings still hold and thus are generalizable to other learning community efforts at large, urban, research institutions.

A second limitation is the small sample size due to an initially small target group and a low response rate. Future research in this area should attempt to gain a larger sample initially and offer incentives for the return of the survey questionnaires in hopes of a larger response rate.

A third limitation is the inability to empirically verify if there was any difference in response bias between cluster and non-cluster students due to the lack of data. Future research must secure input data for non-respondents. However, because both the cluster students and the selected non-cluster students are all high achievers, that is they all had extremely high SAT scores and high school GPA's, there is no reason to think that the non-respondents came in any less prepared for college academics.

A fourth limitation is the researcher's inability to partial out which aspects (or interactions) of the cluster program actually affected the outcomes. Because the follow-up survey does not ask questions that specifically target the interdisciplinary, team-taught, yearlong lecture/discussion/seminar aspects of the cluster courses, it is impossible to determine *which* of these aspects (or combinations of these) are responsible for the impact of cluster participation on student outcomes. Future research should disaggregate the structural aspects of clusters and also use qualitative methods to get at some of the reasons and ways students feel that clusters have affected them.

The fifth limitation is the small amount of variance in the dependent variable each regression equation explains (R^2). However, since students in clusters and in the comparison group matched on key variables such as GPA and SAT, even the small amount of variance explained is significant and should not be discounted.

Conclusion

Tinto's (1987) and Astin's (1985) theories are both about the importance of student involvement in their intellectual and personal development, which this study was designed to examine. In how cluster participation affects students, it was involvement in a learning community (cluster participation) that helped foster the studied outcomes. Change in intellectual ability such as reading speed/comprehension can be explained by involvement in an academic community that fostered intellectual aims, including studying more and increasing intellectual skills. Some of the peer interaction variables could also be considered intellectual variables since working on group projects may very well foster intellectual empowerment (Boyer, 1987). The faculty and peer interaction variables (even without the intellectual stimulation aspect) can also be seen as a form of involvement. Even if the quantity is not greatly altered by cluster participation, the quality of faculty-student interaction and peer interaction that improved when students participate in a cluster.

There seems to be a slight increase in the way student's view their academic skills (as seen in reading comprehension/speed), although perhaps not as much as was initially hoped (e.g., no impact on critical thinking skills). While a strict increase in faculty contact was not achieved, the contact does seem to be of a higher quality (as seen in intellectual stimulation/challenge).

Finally, while participation in a cluster may not increase the amount of time spent with peers, it does seem to influence the quality of time spent with peers in that this time is more an intellectual or academic (as seen in group projects and discussing politics), nature.

From the seven regression equations investigated in this study it is clear that cluster participation has an impact on student outcomes, over an above other college experiences, but certainly does not explain everything. The learning community cluster experience helps students begin to integrate into the collegiate environment on a number of levels. Specifically, cluster involvement impacts academic integration, quality of faculty interaction, and quality of interaction with peers in an academic setting.

It is important to continue following these students to examine long term effects of cluster participation. It will also be informative to examine different cohorts in order to assess whether as the clusters become more refined and move closer to their stated goals they also become more effective with respect to intended outcomes.

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Appendix

Coding Scheme for Variables

Variable	Coding Scheme
Dependent Variables	
Change in reading speed/comprehension	1=Much weaker to 5=Much stronger
Change in critical thinking ability	1=Much weaker to 5=Much stronger
HPW talking with faculty outside of class	1=none to 8=over 20
Faculty provided intellectual challenge/stimulation	1=Not marked; 2=Marked
Frequency of discussing course content with students	1=Not at all to 3=Frequently
Frequency of participation in a group project in class	1=Not at all to 3=Frequently
Frequency of discussing politics	1=Not at all to 3=Frequently
Block One	
Gender	1=Male; 2=Female
Father's education	1=Grammar school to postsecondary (not college); 2=Some college to graduate degree
Mother's education	1=Grammar school to postsecondary (not college); 2=Some college to graduate degree
Block Two	
High school GPA	Average grade in high school from 1=D to 8=A
SAT	Composite SAT score coded as a continuous variable from 870 to 1600
Plan to live on campus	1=No; 2=Yes (i.e., college dormatory or fraternity/sorority house)
Aspirations in high school	1= none, AA; 2= BA; 3=MA, BD; 4=PhD, MD, JD
Physical science major	1=No; 2=Yes
Life science major	1=No; 2=Yes
Humanities major	1=No; 2=Yes
Social science major	1=No; 2=Yes
Cooperativeness in high school	1=Lowest 10% to 5=Highest 10%
Keep up to date with politics in high school	1=Not important to 4=Essential
Block Three	
Did extra (unassigned) work	1=Not at all to 3=Frequently
HPW studying/homework	1=None to 8=Over 20
HPW reading for pleasure	1=None to 8=Over 20

Discussed course content with students	1=not at all to 3=frequently
Worked on a group project in class	1=not at all to 3=frequently
Studied with other students	1=not at all to 3=frequently
Challenged a professor's ideas in class	1=not at all to 3=frequently
Worked on an independent study project	1=not at all to 3=frequently
Change in academic ability	1=much weaker to 5=much stronger
Change in drive to achieve	1=much weaker to 5=much stronger
Change in leadership ability	1=much weaker to 5=much stronger
Change in intellectual self-confidence	1=much weaker to 5=much stronger
HPW talking with faculty outside of class	1=none to 8=over 20
HPW socializing with friends	1=none to 8=over 20
HPW participating in student clubs/orgs.	1=none to 8=over 20
Participated in demonstrations in the last year	1=not at all to 3=frequently
Voted in state/national election in the last year	1=not at all to 3=frequently
Worked in political campaign in the last year	1=not at all to 3=frequently
HPW performed volunteer work	1=none to 8=over 20
Block Four	
Cluster participation	1=No; 2=Yes

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