

**The effects of a residential learning community on first-semester biological science freshmen  
at a traditional land-grant university**

**by**

**Stephanie L. Hamilton**

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**Graduate College  
Iowa State University**

**This is to certify that the Master's thesis of  
Stephanie L. Hamilton  
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## CHAPTER 1: INTRODUCTION

University administrators, faculty and staff are increasingly aware of the need for more intentional integration of students' academic and out-of-classroom experiences. That integration of various aspects of student lives, often referred to as a seamless learning environment, leads to enhanced educational experiences and enhanced student learning (Schroeder & Mable, 1994).

The idea of integrated student learning experience received primary attention from three documents, spanning ten years. The first of these was Involvement in Learning: Realizing the Potential of American Higher Education which was written by the National Institute of Education's Study Group on the Conditions of Excellence in American Higher Education (Study Group, 1984). The second, entitled College: The Undergraduate Experience in America was written by Ernest Boyer in 1987. And the third, The Student Learning Imperative was commissioned by the American College Personnel Association in 1994. All three documents give special attention, in various ways, to the need for integrated student learning experiences.

Involvement in Learning focuses on improving the quality of undergraduate education and "proposes specific steps for overcoming the barriers that prevent us from realizing the full potential of higher education in American society" (1984, pp. 3-4). Much of the emphasis is placed on student learning and the belief that undergraduate education can be improved by applying "existing knowledge about three critical conditions of excellence- 1) student involvement, 2) high expectations, and 3) assessment and feedback" (p. 17). The Involvement in Learning Study Group made several suggestions which are relevant to integrated learning environments. The Study Group members suggest, "Classes for first-year students should be designed to provide adequate opportunities for intense intellectual interaction between students and instructors" (p. 25). From a budgetary standpoint, they believe that the funds directed toward first- and second-year students should be increased because we know that "by

concentrating faculty and other resources on those students, we increase the probability of involvement, retention, learning..." (p. 26). A final recommendation follows:

Every institution of higher education should strive to create learning communities, organized around specific intellectual themes or tasks...The larger the institution, the more critical these niches are in providing a meaningful academic identification for students. (p. 33)

Boyer's College: The Undergraduate Experience in America "consider[s] the undergraduate experience in America...and pay[s] particular attention to the way structures and procedures of colleges affect the lives of students" (1987, p. xi). The study found "divisions on the campus, conflicting priorities and competing interests that diminish the intellectual and social quality of the undergraduate experience and restrict the capacity of the college effectively to serve its students" (p. 2). In addition, Boyer found "a great separation - sometimes to the point of isolation, between academic and social life on campus" (p. 5). This does not aid students' learning experiences.

The Student Learning Imperative asserts that student affairs professionals should consider how they can "intentionally create the conditions that enhance student learning and development" (p. 1), recognizing that "if learning is the primary measure of institutional productivity by which the quality of undergraduate education is determined, what and how much students learn also must be the criteria by which the value of student affairs is judged" (p. 2). This leads us to believe that it is the responsibility of all members of the university to encourage change toward increased student learning.

Iowa State University is consciously working to improve its quality of undergraduate education. Evidence to support this can be found in the University's Strategic Plan which reads, "The highest priority of the Strategic Plan for 1995-2000 is to improve the quality of undergraduate education as measured by student retention, graduation, and placement rates" (p. 18). The University anticipates reaching this improvement through several goals. The

first goal reads, "Goal 1: Strengthen undergraduate teaching, programs, and services" (p. 3). Planning includes "greater emphasis on a student-centered learning environment", "increased innovation and excellence in teaching and advising...", "special emphasis on faculty involvement in undergraduate education...", and "increased interdisciplinary and collaborative teaching programs" (p. 18).

In a meeting with Higher Education graduate students on October 28, 1996, Iowa State University President Martin Jischke spoke of the University's Strategic Plan and focused on the importance of the environment outside the classroom. He pointed to academics and students' bonding to the community as being two fundamental ingredients to improved undergraduate education. He also spoke to the importance of judging our effectiveness as we strive to reach our goals; in his words, "being able to demonstrate achievement of purposes". This coincides with the Involvement in Learning's assertion that assessment is an essential part of the process of improving undergraduate education (1984).

According to President Jischke, "Breaking the place into bite-size clusters for human beings..." is a major way by which we can improve the students' experience inside and outside of the classroom. As an example, he made direct reference to the learning teams that were begun at Iowa State during Fall 1995.

Various Colleges and departments at Iowa State University began learning teams for Fall 1995. The composition of these learning teams vary greatly, but the common element is a group of students, usually about 24, enrolling together in several courses. The purpose of the teams is to form an immediate small community which bridges the academic and social aspects of student life. During Fall 1995, 342 total students participated in 20 learning teams. During Fall 1996, 517 students participated in 39 learning teams.

Iowa State University is in a unique position as a learning community institution. Most institutions highlighted in the learning community literature are urban, predominantly commuter, or are traditional community colleges (Tinto, Goodsell-Love, & Russo, 1994).

These institutions are using learning communities to improve the quality of student life, academically and socially. Conversely, Iowa State is a traditional institution that is already "reputed to provide high-quality out-of-class experiences for undergraduates" (Kuh, Schuh, Whitt, and Associates, 1991, p. 23). Very little research has been conducted and published on the effectiveness of learning communities at traditional land-grant institutions. As we emphasize the need to judge our effectiveness in reaching our institutional goals, it becomes clear that assessment of the learning teams at Iowa State University is necessary.

One of the most developed learning team models at Iowa State University is in the Department of Biological Sciences. The Biology Education Success Teams (BEST) are integrated learning communities with a residential component. According to a report issued by the Office of the Registrar on 9/5/96, BEST is described as follows:

The Biology Education Success Teams (BEST) are four teams designed specifically to meet the needs of freshmen majoring in biological sciences. The goals of the program include (a) improving retention by making students feel part of a small social and academic community within a large state university, (b) facilitating interaction between faculty, upper level students and freshmen within the same discipline, and (c) developing collaboration of faculty across the curriculum. The various elements of this program include (a) four teams of 24 biological science majors with one of those teams consisting of honor students, (b) course clusters including Principles of Biology and laboratory, Freshmen English Composition, and Freshmen Orientation, (c) students live in Knapp Hall (Towers) on four floors (two men and two women), (d) students are assigned a faculty mentor, an upper level student mentor and a BEST sophomore student. Students meet with their mentors once every other week for a one hour seminar, and (e) Freshmen English instructors collaborate with the Biology instructors (both lecture and lab) to provide writing across the curriculum. (p. 1)



### Purpose of the Study

The purpose of this study is to determine the effects of participation in a residential learning community on first-semester biological sciences students at a traditional, land-grant institution. The information obtained in this study will aid in our institutional understanding of learning communities and increase our knowledge of learning community impacts for future planning. As mentioned previously, Iowa State University is very different from the institutions where previous data have been gathered on learning communities. Additionally, BEST also has a residential component not found in many other models. Therefore, this study has a unique role to play by filling in a niche in the learning community literature base.

The specific questions which will be examined in this study include:

- 1) Are students enrolled in the BEST Program more involved in their residential setting than students who are not enrolled in BEST?
- 2) Do students enrolled in the BEST Program experience higher levels of faculty-student interaction than students not enrolled in BEST?
- 3) Do BEST students experience less diversity in their student acquaintances than students not enrolled in BEST?
- 4) Do BEST students persist to the second semester of their freshman year at higher levels than students not enrolled in BEST?
- 5) Do BEST students earn higher first-semester freshman year grade point averages than students not enrolled in BEST?
- 6) Do BEST students express higher levels of satisfaction with Iowa State University than students not enrolled in BEST?

### Assumptions of the Study

- 1) The study assumes the survey respondents were honest and thoughtful in their responses.

- 2) Because the assignment to the BEST and non-BEST groups was not random, the study assumes the comparison group (non-BEST) was appropriate.
- 3) The study assumes the survey instrument adequately measured the effects of the learning community participation.

#### Limitations of the Study

- 1) The literature base contains limited empirical research on learning communities, particularly at traditional land-grant institutions, and therefore, very little information regarding previous methods of accurate assessment or results of previous studies was available.
- 2) The study is limited to measuring the effects of learning community participation after only one semester of college enrollment.

#### Definitions of Learning Communities

Because various sources provide different definitions for learning communities, several are included here. Alexander Astin (1985) defines learning communities as "small subgroups of students...characterized by a common sense of purpose...that can be used to build a sense of group identity, cohesiveness, and uniqueness that encourage continuity and the integration of diverse curricular and co-curricular experiences" (p. 161). Gabelnick, MacGregor, Matthews, & Smith (1990) provide several explanations: The first of these reads, "Learning communities, as we define them, 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" (p. 5). The second definition reads, "A learning community is any one of a variety of curricular structures that link together several existing courses--or actually restructure the curricular material entirely--so that students have opportunities for deeper understanding and integration of the material they are learning, and more interaction with one another and their teachers as fellow participants in the learning enterprise" (p. 19).

### Organization of the Thesis

Chapter 2 provides a review of the literature pertinent to this study. Chapter 3 explains the methods employed for this study. Chapter 4 presents the results of the analysis and a discussion of the findings. Chapter 5 includes a summary of the study in addition to a discussion of the implications of the research and ideas for future research and/or assessment of learning community initiatives.

## CHAPTER 2: REVIEW OF LITERATURE

### Introduction

This chapter will provide an overview of the philosophy/history and models of learning communities, as well as a review of the empirical research which has been conducted on learning communities. The empirical research on learning communities will be reviewed and then further explained through focus on the topical areas of particular relevance; namely involvement/community, residential on-campus living, peer-peer interaction, student-faculty interaction, persistence/retention, academic success, and satisfaction with the university experience.

### Philosophy/History of Learning Communities

The philosophy of learning communities can be traced to John Dewey's and Alexander Meiklejohn's inter-related but separate ideas on general and liberal education (Gabelnick, MacGregor, Matthews, & Smith, 1990). Opposing the static and fragmented education of the 1920s, Dewey called for cooperative and collaborative education. According to Gabelnick et al. (1990), "The type of education Dewey promoted required a close relationship based upon an attitude of 'shared inquiry'...the teacher is now a partner in a collaborative relationship" (p. 16).

Meiklejohn's insights focused on "the fundamental importance of structure, curricular coherence, and community" (p. 12) in education because he believed education was preparing students to become responsible citizens. Meiklejohn's ideas came to fruition on several campuses at different times. The first of these applications lasted from 1927 to 1932 at the Experimental College of the University of Wisconsin. The program was "an integrated, full-time, two-year, lower-division program focusing on democracy in 5th Century Athens and 19th Century America" (p. 11). During the latter half of the 1960s, Joseph Tussman, a former student of Meiklejohn, began a learning community effort at the University of California-Berkeley. Fighting the specialization of the University, "[Tussman's] solution was to abolish

courses as the basic curricular planning units and to see the lower-division curriculum as a 'program' rather than a collection of courses" (Gabelnick et al., 1990, p. 12). Although the effort at Berkeley only survived a few years, it paved the way for a program started at Evergreen State College in Washington in the 1970s which still exists today. Evergreen uses the model of learning communities labeled as "coordinated studies" (Gabelnick et al., 1990, p. 33), which will be explained in the next section of this chapter. Evergreen State College serves as a model for today's learning communities. Aspects of John Dewey's and Alexander Meiklejohn's philosophies can be found throughout today's learning community models.

### Learning Community Models of Today

The transition from high school to college involves "cutting loose from past social networks and established identities. In their place, new identities and interpersonal networks must be constructed, and academic and social structures...must be learned" (Pascarella & Terenzini, 1991, p. 650). As a way of helping students in this transition and in an effort to restructure early college curriculum, many colleges and universities are instituting learning communities. According to Smith (1993), "Many different curricular restructuring models are being used, but all of the learning community models intentionally link together courses or course work to provide greater curricular coherence, more opportunities for active learning, and interaction between students and faculty" (p. 3).

Gabelnick et al. (1990) describe the five basic types of learning communities that are found in various institutional settings. The five models are linked courses, learning clusters, freshman interest groups, federated learning communities, and coordinated studies.

In the linked courses, a "cohort of students enrolls in two courses, frequently a skills course and a content course" (Gabelnick, et al, 1990, p. 32). In the clusters model, a "cohort of students enrolls in two, three, or four discrete courses linked by common themes, historical periods, issues, problems" (p. 32). In freshman interest groups (FIGs), a "cohort of freshman students enrolls as a small group in three in-place larger classes and meet weekly with a peer

adviser" (p. 33). In federated learning communities, a "cohort of students and Master Learner enroll in three 'federated' in-place courses and participate in a content-synthesizing seminar; faculty of federated courses may offer an additional 'core course' designed to enhance the program theme" (p. 33). The fifth model, coordinated studies, is a "multidisciplinary program of study involving a cohort of students and team of faculty drawn from different disciplines; taught in intensive block mode to a central theme; teaching is done in a variety of formats...and all faculty attend all parts of the program" (p. 33).

The five models have been adapted for various institutional needs, a point about which Gabelnick et al. (1990) states, "The precision of these local adaptations has been crucial to the success and sustainability of these programs, but the beauty of these models is that they are versatile and dynamic" (p. 31). For further in depth explanation of the five models' components, the reader is directed to the work of Gabelnick et al. (1990, pp. 32-37). This work thoroughly examines and explains the models by highlighting the following elements: size of institution, basic unit of instruction, number of students involved, faculty roles, faculty co-planning, student seminars, faculty seminars and community-building mechanisms.

The B.E.S.T. Program at Iowa State University, and the focus of this study, is most similar to FIGS; therefore it is worthwhile to explain the FIG model more thoroughly. Tukono (1993) describes the FIG program which is in place at the University of Washington:

The basic approach of the Freshman Interest Group Program is to bring a small group of freshmen together into the same two or three courses during their first quarter. The courses in the program are organized around some theme, such as "Pre-Engineering" or "The Individual and Society". Each group consists of about twenty to twenty four freshman who enroll in the program on a first-come, first-served basis during summer registration for new students. All of the groups consist of at least one course comprised entirely of Freshmen Interest Group students and, in courses which are broken into small sections led by a teaching

assistant, most or all of the students in a designated section are in the FIG Program.

(p. 8)

The individual FIGs at the University of Washington also meet weekly with an advanced undergraduate known as a peer adviser which "provides an opportunity to discuss the course work, meet with the faculty and teaching assistants, form small study groups, learn about various campus resources, and air problems of adjustment or academics" (Tokuno, 1993, p. 8). The main differences between the FIGs at the University of Washington and the BEST Program at Iowa State University is that BEST Program has a residential component and a faculty "mentor" in addition to the peer adviser.

#### Snapshot of Learning Community Findings

The literature includes extensive publications on learning communities, although very little of it reports empirically based research. The remainder of this chapter will focus primarily on the empirical, comparative research findings which focus on "whether collaborative learning programs independently enhance student achievement" (Tinto, Goodsell-Love, & Russo, 1993, p. 16), rather than anecdotal accounts and administrative process issues of learning communities (MacGregor, 1991).

Most of the documented research on learning communities has taken place at institutions very different from Iowa State University. The institutions most prominent in the literature are urban campuses, commuter institutions, and community colleges; places not considered to be highly "involving" (Tinto, Goodsell-Love, & Russo, 1994). The elements necessary for an institution to be considered "involving" are broad, but the basic underlying theme is that they are "reputed to provide high-quality out-of-class experiences for undergraduates" (Kuh, Schuh, Whitt, and Associates, 1991, p. 23). It is challenging to provide typical high-quality out-of-class experiences at institutions where the majority of the student body does not reside or spend a great deal of time on campus. Iowa State differs from these researched institutions in that it is an "involving" college.

The limited longitudinal research shows the effects of learning communities are quite positive. Smith (1991) reports:

Preliminary studies demonstrate that learning communities do work. They result in more intellectual interaction among students and between students and faculty members. They increase student involvement and create a sense of community. The programs show impressive results in terms of student academic achievement, student intellectual development, retention, transfer, and student motivation. Learning communities increase curricular coherence and provide ample opportunities for the integration and reinforcement of ideas. They promote an understanding of complex issues that cross disciplinary boundaries. (p. 45)

Similarly, Tinto, Goodsell-Love, & Russo (1994b), through their research of the learning communities at the University of Washington, Seattle Central Community College and LaGuardia Community College in New York, found the following:

[Students] saw the faculty and their student peers as more welcoming and supportive, their classes as more involving, the campus climate as more comfortable and friendly, and themselves as more excited and involved in learning. In short, students in learning communities were more engaged in learning and more positive about that engagement than were students in non-linked courses in the institution. (p. 9)

The one major drawback of learning communities is mentioned in the literature by Pascarella, Terenzini, and Blimling (1994). They acknowledge that while learning communities can be a powerful vehicle for advancing the educational mission of the university, learning communities may be detrimental to students' experience of diversity during college.

Overall, "[learning communities] served to bridge the academic-social divide that typically plagues student life" (Tinto, Goodsell-Love, & Russo, 1994a, p. 5).



### Campus Involvement/Community

The issues of campus involvement and community are prevalent in today's literature (Astin, 1993; Study Group, 1984; Pascarella & Terenzini, 1991; Tinto, 1993; Tinto, 1990; Tokuno, 1993), and the message presented is clear. According to Pascarella and Terenzini (1991), "...the greatest impact [on student learning] may stem from the students' total level of campus engagement, particularly when academic, interpersonal, and extracurricular involvements are mutually supporting and relevant to a particular educational outcome" (p. 32). Similarly, the National Institute of Education's Study Group on the Conditions of Excellence in American Higher Education reports, "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" (Study Group, 1984, p. 19).

Stressing the importance of involvement, Tinto's research lists "Community" as the first principle of effective retention. The Principle of Community (Tinto, 1990) follows:

Effective programs commonly stress the manner in which their actions serve to integrate individuals into the mainstream of the social and intellectual life of the institution and into the communities of people which make up that life. They consciously reach out and make contact with students in order to establish personal bonds among students and between students, faculty, and staff members of the institution. (p. 36)

Expanding upon this point, Tinto writes, "The use of faculty and peer mentor programs, frequent informal meetings and activities all serve to heighten the degree and range of interaction among members of the community" (p. 36).

The effects of involvement in community are very beneficial to students and their institutions. Tinto has found that "...membership in at least one supportive community, whatever its relationship to the center [of the academic and social mainstream of the college], may be sufficient to insure continued persistence [in college]" (1993, pp. 60-61). Likewise,

Alexander Astin (1993) has found that a "lack of Student Community on the campus is associated with [students] not wanting to re-enroll" (p. 280).

Learning communities can be seen as a response to Tinto's theory "to the extent that the groups provide a student with a small community which eases the passage into the larger community of the university" (Tukono, 1993, p. 10). Tinto, Goodsell-Love and Russo, through a survey questionnaire at the University of Washington, Seattle Central Community College and LaGuardia Community College, found that learning community students on all three campuses "reported greater personal involvement in the range of academic and social activities and greater perceived developmental gains...over the course of the year than did students in the regular curriculum at each of the three institutions" (1994b, p. 7).

Qualitative researchers at Temple University found that students frequently cited "meeting people and forming study groups" as benefits of participation in a learning community (Levine & Tompkins, 1996, p. 6). Similarly, Tinto, Goodsell-Love and Russo (1994b) present the following statement on learning communities:

In all three settings, participation in a first-year learning community enabled students to develop a network of supportive peers that helped students make the transition to college and integrate them into a community of peers. This community of peers, formed in their learning communities, provided students with a small, knowable group of fellow students with whom early friendships were formed. Some friendships lasted, others faded. But in all cases, students saw those associations as an important and valued part of their first-year experience. (p. 5)

### Impacts of Residential Life

In recent years, increasing attention has been paid to the role residence halls can play in the educational process (Kuh, 1994; Pascarella, Terenzini, & Blimling, 1994; Schroeder, 1994; Schroeder & Mable, 1994; Stimpson, 1994; Whitt & Nuss, 1994; Winston, Bonney, Miller, & Dagley, 1988; Zeller, 1994). Schroeder and Mable (1994) point out a "renewed

emphasis on promoting student learning through integrating residence hall learning opportunities with the goals and priorities of undergraduate education" (p. 15). According to Stimpson (1994):

Not all learning occurs in the classroom or as a result of formal structured academic experiences. Learning also occurs as students go about the business of daily living; much of it takes place in a residence hall or as a result of interaction with fellow residents. (p. 53)

The empirical data in this area are clear. Pascarella, Terenzini and Blimling (1994) state:

Residential living during college is consistently one of the most important determinants of a student's level of involvement or integration into the various cultural, social, and extracurricular systems of an institution....resident students have significantly more interaction with peers and faculty and are significantly more likely to be involved in extracurricular activities and to use campus facilities. (pp. 25-26)

Learning communities of various levels have found their way into residence halls. The simplest of these residential learning communities is the academic interest unit in which "a group of students with an academic commonality...[reside] in the same proximity" (Smith, 1994, p. 243). Research shows that "homogeneous grouping in residence halls by major can have positive implications for persistence, both in that major and in college" (Pascarella, Terenzini, & Blimling, 1994, p. 37) and this effect on persistence seems to be particularly strong in the sciences (Light, 1990; Chapple, 1984; Schroeder & Griffin, 1977). This effect on persistence is not found to be as strong in the humanities and social sciences (Light, 1990).

Homogeneous assignment in residence halls does have a downside. While homogeneous groupings are a powerful method of promoting the educational mission of an institution through residential living, "there may also be a price to be paid in terms of a

student's experience of diversity during college....[Students] lose something of the experience of diversity gained from others in less specialized living environments" (Pascarella, Terenzini and Blimling, 1994, p. 41).

### Peer Interaction

Expounding upon the importance of the peer group for college students, Astin (1993) offers this definition:

Viewed from a collective or sociological perspective, a peer group would be defined as any group of individuals in which the members identify, affiliate with, and seek acceptance and approval from each other. The word acceptance has two different meanings here. At its most basic level, acceptance refers to the group's acknowledgment that any individual does, in fact, possess the minimal characteristics needed to qualify for membership. (p. 401)

Enrollment in a recognized learning community utilizes this definition of a peer group.

Astin's research shows that "the student's peer group is the single most potent source of influence on growth and development during the undergraduate years" (1993, p. 398). He goes on to state that "students' values, beliefs, and aspirations tend to change in the direction of the dominant values, beliefs, and aspirations of the peer group" (p. 398). This supports Tokuno's finding that "peers are the most important source of assistance in decisions about higher education" (1993, p. 9).

The level of peer-to-peer interaction in learning communities is, as a function of the organization, high. Tinto, Goodsell-Love and Russo (1994a) found that "participation in a first-year learning community enabled students to develop a network of supportive peers that helped students make the transition to college and integrate them into a community of peers" (p. 4). The influence of this peer group will be more easily seen in later sections of this chapter.

### Student-Faculty Interaction

Various researchers have focused on the effects student-faculty interaction has on students. Lampert, in reviewing the literature on student-faculty interaction, focuses on the role informal faculty-student interaction plays in the integration of students into the academic community (1993). He reports that "studies, to varying degrees, confirm the hypothesis that student-faculty interaction increases student persistence and decreases likelihood of voluntary withdrawal" (p. 978). Pascarella (1980) credits the decreased likelihood of withdrawal to the institutional bond which is enhanced by student-faculty interaction. Early research by Pascarella and Terenzini found that freshman year grade point average, intellectual development during the freshman year, and personal development during the freshman year were positively influenced by student-faculty interaction, even after controlling for fourteen pre-enrollment characteristics (1978). Endo and Harpel (1982) however, state, "neither frequency of informal student-faculty interaction nor frequency of formal interaction was found to influence academic achievement, although the latter came close" (p. 127). They did find that informal interaction positively influenced students' satisfaction with their education (Endo & Harpel, 1982, p. 127) and overall satisfaction with the college experience (p. 132).

More recently, Astin and Tinto have collected data on the effects of student-faculty interaction. Tinto (1990) asserts, "The research in this regard is quite clear, namely that the frequency and perceived worth of interaction with faculty, especially outside the classroom is the single strongest predictor of student voluntary departure" (p. 36). This coincides with Tinto's emphasis that "frequent and rewarding contact between faculty, staff, and students in a variety of settings outside the formal confines of the classroom and laboratories of institutional life" (p. 36) influences students' establishment of membership in the campus community.

Astin (1993) asserts, "Next to the peer group, the faculty represents the most significant aspect of the student's undergraduate development" (p. 410). Astin describes student-faculty interaction as "hours spent talking to faculty outside of class, being a guest in a

faculty member's home, assisting faculty in teaching a course, and working on a professor's research project" (1993, p. 114). Astin has also found that student-faculty interaction positively correlates with "self-reported intellectual and personal growth, as well as with a variety of personality and attitudinal outcomes" (p. 383).

A measure found in Astin's research is "scholarship", "defined by three self-ratings -- academic ability, intellectual self-confidence, and mathematical ability -- combined with the highest degree planned by the student" (1993, p. 114), and "the degree of student interaction with faculty has a substantial positive effect on scholarship" (p. 112). Similarly, "student-faculty interaction has positive effects on both career choices and major field choices in all fields of science..." (p. 384).

As reported in the previous section entitled *Snapshot of Learning Community Findings*, student-faculty interaction has been regularly cited as an important aspect of learning communities (Smith, 1991; Tinto, Goodsell-Love, & Russo, 1993). Likewise, focus groups on the learning communities at Temple University "consistently reported that [students] enrolled in learning communities benefit from the more intimate classes and increased interaction with their faculty and peers" (Levine & Tompkins, 1996, p. 6).

#### Persistence/Retention

According to Tinto, "The National average [rate of retention] for four-year institutions is about forty-five percent" (1990, p. 43). This statistic leaves room for improvement; hence the emphasis on retention and persistence in recent literature (Astin, 1993; Pascarella, Terenzini, & Blimling, 1994; Tinto, 1987; Tinto, 1990; Tinto, 1993). What is known about student departure is that most "...depart during their first two years of college, and withdrawal is highest during the first term" (Tinto, 1987 cited in Gabelnick, 1990, p. 63). For the students who persist to a second year of college and then leave, the cause of departure is usually related to first-year experiences (Tinto, 1990).

Pascarella, Terenzini and Blimling (1994) have found a "large body of evidence [which] underscores the importance of social integration during college as a significant determinant of persistence and graduation" (p. 26). This is consistent with early research by Pascarella and Terenzini which found "absence of sufficient contact with other members of the institution proves to be the single most important predictor of eventual departure even after taking account of the independent effects of background, personality, and academic performance" (cited in Tinto, 1993, p. 56). As presented previously, contact with faculty is of particular importance in the contact equation (Tinto, 1993).

Astin expands stating, "Retention is facilitated by both student-student and student-faculty interaction, hours per week spent socializing with friends, partying, talking with faculty outside of class, and being a guest in a professor's home" (Astin, 1993, p. 196). Astin (1993) also found that the number of science courses taken correlates negatively with retention (p. 196).

In general, learning communities are having a positive impact on institutional retention rates. Gabelnick et al. reported in 1990 that "for students in learning communities nationwide, beginning to end-of-quarter retention rates average ten to twenty percentage points higher than typical institutional averages" (p. 63). In one recent study, however, student retention has not been found to be higher for learning community students (Levine & Tompkins, 1996). Reporting on the learning communities at the University of Washington and Seattle Central Community College, Tinto, Goodsell-Love and Russo write:

In each case, multivariate statistical analyses confirmed that participation in a learning community was an independent predictor of persistence to the second year of college even after controlling for a range of other student attributes that also contribute to persistence. (1994a, p. 7).

Research specific to the FIGs at the University of Washington reports students making "speedier progress toward their degree" (p. 7), in addition to persisting at higher levels (Tokuno, 1993).

#### Academic Effects of Learning Communities

Gabelnick et al. (1990) report that while extensive comparative studies have not been done, "preliminary data indicate that students are higher grade point achievers in [learning community] settings" (p. 64). Research since 1990 at various institutions confirms this initial finding (Levine & Tompkins, 1996; Tokuno, 1993; Tinto, Goodsell-Love, & Russo, 1994a; Iowa State University Registrar, 1996). Freshman participating in the FIGs at the University of Washington in Fall 1988, 1989 and 1990 consistently earned significantly higher grade point averages, "not only for the quarters in which they participated, but also three quarters later" (Tokuno, 1993, p. 7), and were making better progress toward graduation than non-FIG students (Tokuno, 1993). When grade point averages were compared on a course by course basis for ten courses, only one class, Psychology as a Natural Science, "showed students to be at a disadvantage" (Tokuno, 1993, p. 13). On average, FIGs students earned grades 0.22 points higher than the students to whom they were compared (Tokuno, 1993), which is statistically significant.

Of particular relevance to BEST is that the students in the biology portion of the FIG cluster at Eastern Washington University usually earn grades 0.5 points higher than the students in the typical Introductory Biology courses (Gabelnick et al., 1990). Learning communities also impact academic development beyond grade point average. It appears that FIGs encouraged student class attendance and class participation (Tinto, Goodsell-Love, & Russo, 1994b) and that learning community students receive fewer incompletes and withdrawals (Levine & Tompkins, 1996, p. 6).



### Student Satisfaction

In a large sampling of students from various institutions, Astin found the following response rates to the question "If you could make your college choice over again, would you still choose to enroll at the college you entered as a freshman?": Definitely yes, 36%; Probably I would, 30.7%; Don't know, 4.6%; Probably not, 16.4%; and Definitely not, 12.2% (Astin, 1993, p. 277). Through the same research project Astin found that "lack of Student Community has stronger direct effects on student satisfaction with the overall college experience than any other environmental measure" (p. 352). He also found, as was mentioned previously, strong connections between overall satisfaction and both student-student interaction and student-faculty interaction.

The limited research focused on learning communities with regards to satisfaction that has focused on perception of the university environment, has found learning community participants to have quite positive views of the campus (Tinto & Goodsell-Love, 1994a; Diefenbach, 1996). FIGs students at the University of Washington, when compared to the students in their comparison class, reported significantly more positive perceptions of the college environment. Their perceptions of classes and the campus climate were also significantly higher (Tinto, Goodsell-Love, & Russo, 1994b). The qualitative findings of Tinto, Goodsell-Love, and Russo (1994a) point to positive perceptions:

They saw the faculty and their student peers as more welcoming and supportive, their classes as more involving, the campus climate as more comfortable and friendly, and themselves as more excited and involved in learning. (p. 7)

### Summary

Overall, the research shows that students seem to be positively affected by learning community participation. Involvement in the community, residence life, peer to peer interaction, student-faculty interaction, academic success, and satisfaction with the environment are enhanced, at least to some degree, by learning communities. Iowa State

University, though, is a different type of institution than those highlighted in the literature; hence, the University cannot assume that the effects of learning communities will be the same as at other institutions of higher education.

The BEST Program at Iowa State University is a well-developed, multi-dimensional learning community model that enrolls many students. Assessment is needed to determine the effects of the program for the University, which may or may not be similar to the effects being measured at other institutions. Additionally, this assessment of BEST may contribute substantially to the literature base, as Iowa State University, a traditional land-grant institution, has been identified an “involving” college.

## CHAPTER 3: METHODS

A discussion of the methods and an explanation of the inferential and descriptive statistics employed in this study follows.

### Establishment of Comparison Group

While acknowledging possible differences between students who chose to enroll in BEST and students who chose not to enroll in BEST, the researcher determined it was necessary to establish a comparison group. A random assignment of students to the BEST program or comparison group was not possible; however, it was possible to establish a comparison group with several similar pre-college traits. The pre-college characteristics chosen were high school rank (HSR) and composite score on the ACT, because of their known correlation with success at the university level (Astin, Korn & Green, 1987).

All BEST students were enrolled in the same large lecture section of Introduction to Biology for Biological Science Majors. Many students not enrolled in BEST and a team of BEST Honors students were also enrolled in this section of Introduction to Biology. A comparison group with a similar average HSR and ACT score was drawn from the students in the section who were not enrolled in BEST or the Honors Program. This comparison group (hereafter referred to as non-BEST for ease of communication) was established by removing all non-freshmen, students for whom the University Registrar did not have a record of HSR or ACT/SAT, or both, and all honors students. Several students in both the group of BEST students and the non-BEST students had SAT scores rather than ACT scores; therefore, the SAT score was converted to an ACT score according to the standard conversion table used by Iowa State University.

An independent t-test using pooled variances was performed on both the ACT scores and high school ranks of the two groups (Freund & Wilson, 1997). The BEST group (n=59) had a mean ACT score of 25.32 (SD = 3.38) and the non-BEST group (n=56) had a mean ACT score 24.23 (SD = 3.95), which were not significantly different,  $t(113)= 1.592$ ,  $p=.114$ . The BEST (n=59) group had a mean HSR of 80.47 (SD=13.02) and the non-BEST group (n=56) had a mean HSR of 79.23 (SD=18.78), which were not significantly different,  $t(113)=.414$ ,  $p=.680$ . Although there were slight differences in the means of ACT and HSR, the comparison group was adequately similar to the BEST group.

### Hypotheses

Based on the research questions presented in the introduction and the findings from the review of literature, the following formal hypotheses were made:

- 1) Students enrolled in the BEST program will report higher levels of involvement in their residential setting than students not enrolled in the BEST program.
- 2) Students enrolled in the BEST program will report higher levels of faculty-student interaction than students not enrolled in the BEST program.
- 3) Students enrolled in the BEST program will experience less diversity in their student acquaintances than students not enrolled in the BEST program.
- 4) Students enrolled in the BEST program will persist to the second semester of their freshman year at higher rates than students not enrolled in the BEST program.
- 5) Students enrolled in the BEST program will earn higher first-semester grade point averages than students not enrolled in the BEST program.

- 6) Students enrolled in the BEST program will express higher levels of satisfaction with Iowa State University than students not enrolled in the BEST program.
- a) Students enrolled in the BEST program will report higher levels of “welcomeness” in their place of residence than students not enrolled in the BEST program.
  - b) Students enrolled in the BEST program will report higher levels of “welcomeness” at ISU than students not enrolled in the BEST program.
  - c) Students enrolled in the BEST program will report a higher likelihood of choosing to enroll at Iowa State University again, if given a chance to choose again, than students not enrolled in the BEST program.
  - d) Students enrolled in the BEST program will report higher likelihood of recommending ISU to a friend than students not enrolled in the BEST program.

### Instrumentation

The assessment of the BEST program for Fall 1996 was influenced by the research parameters established during Fall 1995, the first year of the program. The original research team obtained approval for the assessment through the University Human Subjects Review Committee with the participant consent classified as "signed informed consent". In Fall 1996 a request for continuation of the BEST Program Evaluation was approved by the Human

Subjects Committee. This request included the addition of this study and also changed the consent status to "modified informed consent" (see Appendix A).

For this thesis, questions relevant to the hypotheses were selected from the College Student Environment Questionnaire. Permission to use and adapt items from the College Student Environment Questionnaire was granted by Dr. George D. Kuh of the CSEQ Research and Distribution Program at Indiana University (see Appendix B). Several demographic items and questions related to satisfaction with the BEST Program and Iowa State University were also included with the questions adapted from the CSEQ. The final instrument included a section on experience with faculty, a section on experience in the residential environment, a section on diversity of student acquaintances, and several questions for all respondents related to institutional satisfaction. There were three additional questions for the students enrolled in BEST, related to program satisfaction (see Appendix C).

The instrument was piloted by three students who were not members of the BEST Program or the control group. Several alterations were made as a result of the piloting, and it was determined that the survey could be completed in less than ten minutes.

The instrument was administered during the scheduled time period for the Introduction to Biology final examination. Students received the instrument with their final and were given a brief verbal explanation by the researcher. Students were given the option of non-participation and the freedom to complete the instrument at any point during the exam period. The cover letter reiterated the ways in which the data would be used and the ways in which the identity of the participants would be protected (see Appendix A).

As was mentioned earlier, the freshmen enrolled in this section of Introduction to Biology for whom the Registrar had both a HSR and an ACT/SAT score served as the comparison group. Of the 115 students who were originally identified as part of the BEST and comparison groups, 103 valid surveys were returned. The researcher had to retrieve the surveys of students enrolled in the course who were not in either the BEST group or the control group. The researcher originally planned to identify these surveys by social security number, but because many students chose to not report their social security number, only three surveys were retrieved in this manner. Through various survey responses, eight additional surveys were identified as those of neither non-BEST nor non-comparison group students. Three surveys were non-retrievable due to lack of identifiability, or survey non-participation. The worst case scenario is that the three surveys were mistakenly analyzed as part of the comparison group; if so, they comprised a maximum of 5.5% of the comparison group. Keeping the non-retrievability of the three surveys in mind, 81% (48 of 56) of the identified BEST students and 98% (55 of 56) of the identified comparison group students completed surveys.

### Analysis

The subscale classified as Level of Faculty Interaction included four questions and the section classified as Involvement in Residential Setting included nine questions, all of which were answered with an implied ratio scale that recoded to number of occurrences over the entire semester. The response scale and conversions follow:

<u>Response</u>	<u>Recoded Value</u>
a = two or more times/week	30 times/semester
b= about once/week	15 times/semester
c= about once/couple of weeks	7 times/semester
d= never	0 times/semester

Therefore, a student could score between zero and 120 on the summed scale related to experiences with faculty. A student could score between zero and 270 on the summed scale related to experiences in place of residence.

The subscale classified as Diversity in Student Acquaintances included six questions that were answered on an ordinal scale. These responses were also recoded, but not by a method of implied ratio. The response scale and simple conversions follow:

<u>Response</u>	<u>Recoded Value</u>
a = yes, with more than a dozen	5
b = yes, with between 6 and 12	4
c = yes, with between 3 and 5	3
d = yes, with 1 or 2	1
e = no	0

Therefore each students' score could range from zero to 30 on Diversity in Student Acquaintances.

There were seven cases that had missing responses for one question in a subscale set. In these instances, the missing response was imputed based on the individual's average response to the other items on that specific subscale.



The group of BEST students and the non-BEST students were compared on all three summed subscales, Interaction with Faculty, Involvement in Residential Setting, and Diversity in Student Acquaintances, using a directional independent t-test with pooled variance (Freund & Wilson, 1997). An additional directional independent t-test with pooled variance was performed on the average responses, rather than summed scale responses, for Involvement in Residential Setting.

The remaining survey questions related to satisfaction with the University and the BEST program. The response options for these questions were all in a four-point Likert format, with higher numbers indicating higher levels of satisfaction. Comparison of the BEST group with the non-BEST group on the items related to satisfaction with the University was performed for each question individually, using a directional independent t-test. The questions specifically directed to the BEST students were analyzed using simple descriptive statistics.

First-semester grade point averages of the BEST program students were compared to the grade point averages of the students not enrolled in BEST using a directional independent t-test.

Term-to-Term persistence of the BEST students and non-BEST students was not analyzed due to a very low attrition rate in both groups.

## CHAPTER 4: RESULTS AND DISCUSSION

Analysis was performed as explained in Chapter 3. Because all hypotheses were directional, the t-tests were single-tailed. All presented significance levels are from single-tailed analyses. An alpha level of .05 was used for determining significance on all statistical tests. The summary of the analysis of Involvement in Residential Setting, Level of Faculty Interaction, Diversity in Student Acquaintances and First-Semester Grade Point Average is presented in Table 1.

Table 1. Involvement in Residential Setting, Level of Faculty Interaction, Diversity in Student Acquaintances and First-Semester Grade Point Average

	N	M (SD)	t	p
Involvement in Residential Setting			2.22	.01*
BEST	51	140.39 (57.25)		
non-BEST	55	114.91 (59.76)		
Level of Faculty Interaction			0.49	.31
BEST	51	16.75 (17.62)		
non-BEST	55	15.05 (18.19)		
Diversity in Student Acquaintances			0.54	.29
BEST	51	20.33 (5.17)		
non-BEST	55	19.79 (5.07)		
First-Semester Grade Point Average			0.24	.41
BEST	59	2.60 (0.80)		
non-BEST	56	2.56 (1.01)		

The average scores were higher for the BEST group than the non-BEST group on all summed scores and satisfaction measures; however, the only statistically significant difference was on the measure Involvement in Residential Setting. Discussion will be directed to the summed-scale measures, and then to possible explanations of the lack of significant differences between the BEST students and non-BEST students.

### Involvement in Residential Setting

The difference in level of involvement in residential setting between the BEST students ( $n=51$ ) and the non-BEST students ( $n=53$ ), as measured by the summed-scale, was analyzed for significance (Freund & Wilson, 1997). The directional a priori hypothesis that BEST students would report a higher level of involvement in their residential setting ( $M = 140.39$ ,  $SD = 57.25$ ) than non-BEST students ( $M = 114.91$ ,  $SD = 59.76$ ) was supported,  $t(102) = 2.22$ ,  $p = .01$ . Because the scale produced a wider range of scores than the other summed-scales, a secondary analysis was run on the average responses of each group. Again, the BEST students reported a higher level of involvement in their residential setting ( $M = 15.60$ ,  $SD = 6.36$ ) than non-BEST students ( $M = 12.77$ ,  $SD = 6.64$ ),  $t(102) = 2.219$ ,  $p = .01$ .

The impacts of heightened involvement in the residential setting may be far-reaching. As was mentioned in Chapter 2, interaction within the university community and peer interaction are extremely important for retention and influence on growth and development (Astin, 1993; Tinto, 1990; Tinto, 1993; Tokuno, 1993). On this measure, the BEST program's impact after one semester is consistent with the impacts of learning communities at other institutions (Tinto, Goodsell-Love & Russo, 1994; Levine & Tompkins, 1996).

The research also consistently states that residential living, particularly when integrated with academics, can play a significant role in the education of university students (Stimpson, 1994; Terenzini & Blimling, 1994). Because the BEST students lived together in addition to taking the majority of their coursework together, it is likely that discussions in the residential setting were often times academic in focus, and therefore integrative of the academic and social aspects of student life. The academic atmosphere on the floors of the residence halls where the BEST students were housed undoubtedly affected all of the residents positively, not only the BEST students. The data show the residential component of the BEST program to be a significant aid in the integration of new students into a campus community.

#### Faculty Interaction

The differences in the scores between the BEST students and non-BEST students were analyzed for significance on the summed-scale of student-faculty interaction, and did not support the a priori hypothesis. The BEST students ( $n=51$ ) did not report a significantly higher level of interaction with faculty than the non-BEST students ( $n=55$ ),  $t(104) = .489$ ,  $p = .313$ . The BEST students reported a mean summed score of 16.75 ( $SD=16.75$ ) and the non-BEST students reported a mean summed score of 15.05 ( $SD=15.05$ ).

The lack of a significant difference between BEST and non-BEST students in the Level of Faculty Interaction does not directly contradict previous research, as this measure took place after only one semester (Tinto, Goodsell-Love, & Russo, 1994; Smith, 1991). The students were asked not to report interaction with their BEST faculty mentors, so that the scale did not detect interaction that was a direct result of the BEST program. Although it is a bit surprising that a slightly significant difference was not found in this study, it may be that

the differences will be more evident after several semesters of college enrollment. The BEST students were able to interact on a personal level with a faculty member during their first semester of college, which may prove to have long-term impacts on the level of interaction with faculty the students seek out. Regardless, previous research clearly shows that student interaction with faculty has positive impacts on integration, retention, satisfaction with the institution, self-reported intellectual and personal growth, and career development (Astin, 1990; Astin, 1992; Endo & Harpel, 1982; Pascarella, 1978; Tinto, 1990). The program's make-up strongly encourages, if not requires, students to have early interaction with faculty.

#### Diversity in Student Acquaintances

The differences in scores of reported diversity in student acquaintances between the BEST students ( $n=51$ ) and non-BEST students ( $n=55$ ) were analyzed for significance. The findings did not support the directional a priori hypothesis that students enrolled in the BEST program would report lower levels of diversity of student acquaintances than the non-BEST students,  $t(104) = .54$ ,  $p = .29$ . The BEST students actually reported a slightly higher level of diversity ( $M=20.33$ ,  $SD = 5.17$ ) of student acquaintances than did the non-BEST students ( $M = 19.79$ ,  $SD = 5.07$ ).

As was mentioned in the literature review, concern exists about homogeneous living and learning environments producing a lack of diversity in student acquaintances (Pascarella, Terenzini and Blimling, 1994). Surprisingly, the BEST students experienced a higher, although not significant, level of diversity in their student acquaintances than did the non-BEST students. The difference is not large enough to suggest using learning communities as

a diversity enhancement tool; however, the worry about producing extremely homogenous environments may be unnecessary.

### Term-to-Term Persistence

No statistical analysis was warranted for this hypothesis due to the low level of attrition in both groups. Two BEST students did not re-enroll for Spring semester and one non-BEST student did not re-enroll for Spring semester.

Although significant differences in term-to-term persistence were not found between the BEST and non-BEST students, both groups had very little attrition. Interestingly, the findings of this study contradict some previous findings (Gabelnick et al, 1990; Tinto, Goodsell-Love and Russo, 1994), and confirm another (Levine & Tompkins, 1996). Research consistently shows that most students do “depart during their first two years of college, and withdrawal is highest during the first term” (Tinto, 1987). Additionally, eventual departure is typically linked to a first-year experience (Tinto, 1990). If significant differences in retention are to be found, they may only be detected by longitudinal study.

### Grade Point Average

The difference in first-semester GPAs between BEST students (n=59) and non-BEST students (n=56) was analyzed for significance. The directional a priori hypothesis that BEST students would earn higher first-semester grades was not supported,  $t(113) = .243$ ,  $p = .405$ . The BEST students ( $M = 2.60$ ,  $SD = .80$ ) earned an average first-semester GPA very similar to the average first-semester GPA of the non-BEST students ( $M = 2.56$ ,  $SD = 1.01$ ).

The lack of difference in GPAs between BEST and non-BEST students contradicts previous research findings (Levine & Tompkins, 1996; Tinto, Goodsell-Love & Russo, 1994;

Tokuno, 1993). Before assuming there will never be differences in academic performance, as measured by GPA, longitudinal analysis would be needed. However, the level of involvement/interaction in the residential setting could be acting as a deterrent to academic success. In this case, GPA may not be the academic success indicator most effected by learning community participation. Integration of ideas, cognitive development and areas of career development may be positively affected, and were not measured in this study.

### Satisfaction

The results of the four sub-hypotheses measuring satisfaction at ISU are presented in Table 2. The directional a priori sub-hypotheses were not supported. This finding contradicts previous research on learning community students' satisfaction with their campus experiences (Tinto, Goodsell-Love, & Russo, 1994). The difference in the responses of the two groups to the sub-question, "Would you choose Iowa State University if you could make you college choice again?", did approach significance with the BEST students responding more favorably. It is difficult to explain the lack of significant differences on these measures. Interestingly, both groups responded at a level far exceeding neutrality on all questions. This points to positive perceptions of Iowa State University for all students.

The descriptive statistics for the BEST students' satisfaction with the BEST program are presented in Table 3. Again, the students responded at a level exceeding neutrality on all three questions.

Table 2. Satisfaction at Iowa State University

	N	M (SD)	t	p
Welcomeness in residence?			0.657	.257
BEST	51	3.49 (.70)		
non-BEST	55	3.40 (.71)		
Welcomeness at ISU?			0.404	.344
BEST	51	3.45 (.67)		
non-BEST	55	3.40 (.63)		
Enroll at ISU again?			1.29	.100
BEST	51	3.53 (.58)		
non-BEST	55	3.36 (.73)		
Recommend ISU?			0.53	.298
BEST	51	3.53 (.54)		
non-BEST	51	3.47 (.58)		

Note: On satisfaction scales, 1=lowest response; 4=highest response

Table 3. Satisfaction with BEST

	N	M(SD)
BEST "Welcome"	51	3.33(.89)
BEST "Again"	50	3.00(.88)
BEST "Recommend"	49	2.96(.91)

Note: On satisfaction scales, 1=lowest response; 4=highest response



## CHAPTER 5: SUMMARY AND CONCLUSIONS

### Summary

The purpose of this study was to determine the effects of participation in a residential learning community on first-semester biological science students at a traditional, land-grant institution. A comparison group of students from the biological sciences having statistically similar ACT scores and high school ranks was established and a priori hypotheses (see Chapter 3) were developed from a review of the literature. The hypotheses follow:

- 1) Students enrolled in the BEST program will report higher levels of involvement in their residential setting than students not enrolled in the BEST program.
- 2) Students enrolled in the BEST program will report higher levels of faculty-student interaction than students not enrolled in the BEST program.
- 3) Students enrolled in the BEST program will experience less diversity in their student acquaintances than students not enrolled in the BEST program.
- 4) Students enrolled in the BEST program will persist to the second semester of their freshman year at higher rates than students not enrolled in the BEST program.
- 5) Students enrolled in the BEST program will earn higher first-semester grade point averages than students not enrolled in the BEST program.
- 6) Students enrolled in the BEST program will express higher levels of satisfaction with Iowa State University than students not enrolled in the BEST program.

- a) Students enrolled in the BEST program will report higher levels of “welcomeness” in their place of residence than students not enrolled in the BEST program.
- b) Students enrolled in the BEST program will report higher levels of “welcomeness” at ISU than students not enrolled in the BEST program.
- c) Students enrolled in the BEST program will report a higher likelihood of choosing to enroll at Iowa State University again, if given a chance to choose again, than students not enrolled in the BEST program.
- d) Students enrolled in the BEST program will report higher likelihood of recommending ISU to a friend than students not enrolled in the BEST program.

An instrument measuring the above hypotheses was administered to all of the students in BEST and the comparison group during finals week of the students’ first semester of college. The Biology Education Success Teams (BEST) students answered several additional questions regarding satisfaction with BEST. First-semester GPAs and term-to-term persistence data were attained from the University Registrar at the end of January 1997. The two groups were compared on the various measures using independent t-tests.

#### Conclusions and Recommendations for Future Research

The overall strength of the BEST program is apparent from the results of the satisfaction measures. Interestingly, the differences between the BEST students and non-BEST students were only significant on the measure Involvement in Residential Community.

The differences were not significant on the other measures: Interaction with Faculty, Diversity in Student Acquaintances, Term-to-Term Persistence, First-Semester GPA, Satisfaction with Iowa State University, and Satisfaction with BEST. The lack of significant differences contradicts the findings of previous research at other institutions; however, there may be several explanations for the lack of differences.

First, Iowa State University is a traditional land-grant institution that is known to be highly “involving” (Kuh et al, 1991). The institutions where previous data have been collected are urban, commuter or traditional community colleges; places where communities do not develop as naturally. The “involving” climate at Iowa State University may help to explain the lack of differences between the BEST students and the non-BEST students. Although the non-BEST students were not part of a formal learning community program, they were part of various other communities.

Second, the instrument was administered after only one semester of college attendance, the GPAs compared were after only one semester of college coursework, and the retention data were collected after only one semester as well. It is likely that some differences may surface later in the students’ college careers. A longitudinal study may be required for determining learning community impact. We know a great deal about the influence of faculty-student interaction and the establishment of an immediate community on later student outcomes; however, the immediate outcomes are less clear. Drawing conclusions after one semester is premature.

Third, for the areas outside of GPA and Term-to-Term Persistence, a more valid instrument may be needed for accurate assessment. The questions on the instrument were

adapted from the College Student Environment Questionnaire, and have not been used previously for assessment of learning communities.

Lastly, and related to the third point, learning communities may be impacting areas that researchers/educators have yet to identify. This is the second study, the first being published by Levine and Tompkins (1996, June) from a study at Temple University, to find no significant differences in retention of learning community participants over non-participants. Many institutions' upper-administration members are viewing learning communities as a retention tool. Justification for learning communities may become difficult if the GPAs and persistence of the learning community students are not higher than those of non-participants.

Although the differences in satisfaction were not significant, the BEST students did respond positively and slightly higher than the non-BEST students, to the questions relating to satisfaction with the institution and the BEST program. This, by itself, may justify continuance of the program, even if we are not seeing huge short-term differences of GPAs and persistence.

Future research could address issues related to learning community self-selection and effectiveness, such as student learning style, personality type, gender and academic motivation. Additionally, pre- and post-testing of both the BEST students and the comparison groups on measures of cognitive, emotional and social development, could prove useful as learning communities are refined and assessed.

Learning communities have the potential for increasing student learning and development. Academic and social aspects of student lives are being bridged, but we have come to a point where serious attention must be paid to the outcomes we are attempting to


reach and the ways by which those outcomes can be measured. The need for integrated learning experiences for students is clear (Study Group, 1984), and now that the integration has accelerated, the assessment of that integration must be accelerated and refined as well.

**APPENDIX A: HUMAN SUBJECTS REVIEW**

9-6-96

To: Human Subjects Committee  
203 Beardshear

From: Adah Leshem-Ackerman  
Biology  
201 Bessey




Re: Continuation of B.E.S.T. Program Evaluation.

We are planning to continue the evaluation process on the B.E.S.T. Program that we began last Fall, 1995. We received permission from the Human Subjects Committee to conduct surveys with the students participating in the program as well as a group of students who were matched to these B.E.S.T. students.

This year we would like to request to change the student's consent from a signed informed consent to a modified informed consent. We feel the students that participate are at minimal risk. Attached is the information sheet that will be handed out to the students at the time they do the survey.

Dr. Mark Windschitl is no longer the principle investigator. Dr. Adah Leshem-Ackerman will now serve in that role. Stephanie Hamilton, a graduate student in Professional Studies, will be involved in this research and will be using some of her data for her thesis.

We will be using the Iowa Developing Competency Inventory for both a pre-test and post-test.

4  
1  
9-10-96

Last Name of Principal Investigator WINDSCHITL

## Checklist for Attachments and Time Schedule

The following are attached (please check):

12.  Letter or written statement to subjects indicating clearly:
- purpose of the research
  - the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see item 17)
  - an estimate of time needed for participation in the research and the place
  - if applicable, location of the research activity
  - how you will ensure confidentiality
  - in a longitudinal study, note when and how you will contact subjects later
  - participation is voluntary; nonparticipation will not affect evaluations of the subject
13.  Consent form (if applicable)
14.  Letter of approval for research from cooperating organizations or institutions (if applicable)
15.  Data-gathering instruments (Final versions will be submitted when complete)

## 16. Anticipated dates for contact with subjects:

First Contact

11/2/95

Month / Day / Year

Last Contact

12/1/95

Month / Day / Year

## 17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

7/1/96

Month / Day / Year

## 18. Signature of Departmental Executive Officer      Date      Department or Administrative Unit

18      Biology

## 19. Decision of the University Human Subjects Review Committee:

 Project Approved       Project Not Approved       No Action RequiredPatricia M. Keith

Name of Committee Chairperson

9/14/95

Date

Signature of Committee Chairperson

The committee suggested that the Principal Investigator, Mark Windschitt, include in the consent form that subjects are free to withdraw at any time. When I phoned Mark, he indicated that this is part of the course but that he could include a statement that subjects could choose to have their individual



**APPENDIX B: CSEQ CORRESPONDENCE WITH INDIANA UNIVERSITY**

Dr. George D. Kuh  
 CSEQ Research and Distribution Program  
 Center for Postsecondary Research and Planning  
 School of Education, #4223  
 201 N. Rose Avenue  
 Indiana University  
 Bloomington, IN 47405-1006

Dear Dr. Kuh:

I am a graduate student in Higher Education at Iowa State University. Dr. Larry Ebbers is my major professor and Dr. Florence Hamrick is on my committee. I am writing this formal request following e-mail correspondence with Mr. Mark Connolly. My thesis research focuses on the Biology Education Success Teams (B.E.S.T.) Program in the Department of Biology. B.E.S.T. is a learning community initiative in the biological sciences for first semester freshmen. Components of the program include: a faculty and upperclass biology student mentoring, coursework across the biology and English curriculum, a living component, and shared enrollment in the majority of first semester courses.

I am specifically interested in the differences between the B.E.S.T. students and the non-B.E.S.T. students, who are serving as a comparison group, in the following areas: level of faculty interaction, diversity of student acquaintance, involvement in residential setting, and level of satisfaction with the institution. I will also be analyzing the level of satisfaction the B.E.S.T. students feel toward their University experiences, Iowa State University, and the B.E.S.T. program.

I am requesting permission to use and adapt specific items from the CSEQ, to be included in my instrument for Fall 1996. I am proposing to use/adapt questions from the sub-sections Experiences with Faculty, Student Acquaintances, Campus Residence, and Opinions About College. For the analysis, I plan on summing subscales and comparing the B.E.S.T. and comparison groups using t-tests.

Below you will find a copy of the questions in their adapted form, particularly in regards to scaling, that I would like to use for my survey. These questions are pertinent to my hypotheses, and would be very helpful in my research.

-----  
 Please note that additional, non-CSEQ, questions will be incorporated. Therefore, the questions are not yet numbered.

DIRECTIONS: In your experience at Iowa State University this semester, about how often have you done each of the following?

a=two or more times per week  
 b= about once a week  
 c= about once every couple of weeks  
 d= once or twice this semester  
 e=never

(B.E.S.T. participants: In questions about experiences with faculty, this does *not* include your faculty mentor)

How often have you.....?

... asked your instructor for information related to a course you were taking  
 (grades, make-up work, assignments, etc.)?

... visited informally and briefly with an instructor after class?

... made an appointment to meet with a faculty member in his/her office?

... discussed personal problems or concerns with a faculty member?

DIRECTIONS: For the following five questions, please use the options below.

a= yes, with more than a dozen  
 b= yes, with between 6 and 12  
 c= yes, with between 3 and 5  
 d=yes, with 1 or 2  
 e=no

Have you made friends with students whose academic major field was very different from yours?

Have you made friends with students whose family background (economic and social) was very different from yours?

Have you made friends with students whose race was different from yours?

Have you made friends with students whose interests were very different from yours?

Have you made friends with students from another country?

DIRECTIONS: If you are now living in a residence hall or fraternity/sorority, about how often have you done each of the following in the residence unit during this semester? Indicate your response by choosing the letter on your response sheet which corresponds to the following options:

- a=two or more times *per week*
- b= about once *a week*
- c= about once every *couple of weeks*
- d= once or twice this *semester*
- e=never

If you do not live in a residence hall or fraternity/sorority, please omit the following 9 items.

How often have you.....?

- ... had lively conversations about various topics during dinner in the dining hall?
- ... gone out with other students for late night snacks?
- ... offered to help another student (with course work, errands, favors, advice, etc.) who needed some assistance?
- ... participated in discussions that lasted late into the night?
- ... asked others for assistance in something you were doing?
- ... borrowed things (clothes, tapes, posters, books, etc.) from others in the residence unit?
- ... attended social events put on by the residence unit?
- ... studied with other students in the residence unit?
- ... helped plan or organize an event in the residence unit?

If you could start over again, would you attend Iowa State University again?

- a. Yes, definitely
- b. Probably yes
- c. Probably no
- d. No, definitely not

I appreciate your time in considering my request. Please contact me if you have any questions. I hope to hear from you soon.

Sincerely,

Stephanie L. Hamilton  
110 Marston Hall  
Iowa State University  
Ames, IA 50011  
(515) 294-9963

INDIANA UNIVERSITY



## COLLEGE STUDENT EXPERIENCES QUESTIONNAIRE

Center for Postsecondary Planning and Research

School of Education, #4223

201 North Rose Avenue

Indiana University

Bloomington, IN 47405-1006

Phone: (812) 856-8041

Fax: (812) 856-8394

Internet: CSEQ@INDIANA.EDU

SCHOOL OF  
EDUCATION

December 2, 1996

Ms. Stephanie L. Hamilton  
110 Marston Hall  
Iowa State University  
Ames, IA 50011


Dear Ms. Hamilton:

Professor Kuh has passed along to me your letter in which you requested permission to use numerous items from the *College Student Experiences Questionnaire* in your research on participation in the Iowa State B.E.S.T. program. On his behalf, I'm writing to notify you that your request for such use will be permitted, contingent upon your agreement to the following stipulations:

1. Your use of CSEQ items is restricted to the items you specified in your letter of 8 November 1996; no other questions may be used without explicit permission.
2. Your use of CSEQ items is limited to use only in the study described in the aforementioned letter.
3. You will note somewhere in your report(s) that the items were taken from the CSEQ and used with permission from the Center for Postsecondary Research and Planning at Indiana University.
4. You will send a copy or summary of any reports resulting from your study, published or unpublished, to Dr. Kuh upon the study's completion.

Please confirm the receipt of this agreement and your acceptance of the terms with a letter (which we will keep on file). We hope to hear from you soon, and best wishes with your study.

Sincerely, 

Mark Connolly  
CSEQ Project Manager 

W. W. Wright Education  
Building  
Bloomington, Indiana  
47405-1006

December 11, 1996

Dr. George Kuh and Mr. Mark Connolly  
College Student Experiences Questionnaire  
Center for Postsecondary Planning and Research  
School of Education, #4228  
201 North Rose Avenue  
Indiana University  
Bloomington, IN 47405-1006

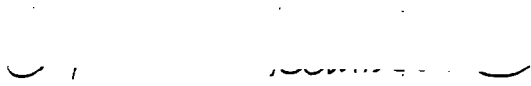
Dear Dr. Kuh and Mr. Connolly:

I have received Mr. Connolly's letter of December 2, 1996, in which I was granted permission to use items from the College Student Experiences Questionnaire for my master's research on participation in the Iowa State University B.E.S.T. (Biology Education Success Teams) program. I accept permission to use the CSEQ items contingent upon the following stipulations to which I agree:

1. My use of CSEQ items is limited to the items I specified in my letter of 8 November 1996; no other questions will be used without explicit permission.
2. My use of CSEQ items is limited to the study conducted for my master's thesis at Iowa State University.
3. I will note in my report(s) that the items were taken/adapted from the CSEQ and used with permission from the Center for Postsecondary Research and Planning at Indiana University.
4. I will send a copy or summary of any reports resulting from my study, published or unpublished, to Dr. Kuh upon the study's completion.

Thank you for your quick attention to my request. I plan to administer my survey on December 17, 1996, and hope to have my thesis completed by mid-March. You can expect to receive a report from me by the end of May 1997.

Sincerely,

  
Stephanie L. Hamilton  
Graduate Student  
Professional Studies in Education  
Iowa State University

**APPENDIX C: COVER LETTER AND INSTRUMENT**



December 18, 1996

Dear Biology 201 Student:

Attached you will find a survey about the Biological Sciences program here at Iowa State University. Our review of these answers will help us improve the program for future students. We would appreciate your taking the time to fill-out the survey and turn it in with your Biology 201 final. However, we want you to know that this survey is entirely separate from your Biology 201 final and your responses will in no way affect your Biology 201 grade.

This data will be used by the Biological Sciences department and by Stephanie Hamilton for a master's thesis in the Department of Professional Studies in Education. We will use your social security number for tracking purposes only. Please be assured that your social security number will be erased once the surveys have been initially sorted, and you will no longer be personally linked to your responses. At no time will you be personally identified as a participant in this project. We have taken and will continue to take all steps in accordance with Human Subjects Review policy.

Thank you for your participation. Please use the small blue and white data sheet for your responses.

Sincerely,

Adah Leshem-Ackerman  
Coordinator of Advising  
Biological Sciences

Stephanie L. Hamilton  
Graduate Student  
Professional Studies in Education

**SPECIAL CODES:** Please begin by filling in the spaces marked "SPECIAL CODES" with your Social Security number. Blank "J" will be empty.

**COMMENT 1:** In the box on the right-hand side of the data sheet marked "COMMENT 1", please write in your AGE in years.

**COMMENT 2:** In the box on the right-hand side of the data sheet marked "COMMENT 2" please write in your ethnicity/race.

1. Gender:                    a=female    b=male
2. Please choose the appropriate response:  
  
a= You are *not* enrolled in the B.E.S.T. program.  
b= You are enrolled in the B.E.S.T. program and taking English 105.  
c= You are enrolled in the B.E.S.T. program and taking English 105H.  
d= You are enrolled in the B.E.S.T. program and taking English 104.
3. What is your academic classification at the University?  
  
a= freshman  
b= sophomore  
c= junior  
d= senior
4. During the semester, approximately how many total hours per week do you spend in classes/labs and studying?  
  
a= Approximately 50 hours per week or more  
b= Approximately 40-49 hours per week  
c= Approximately 30-39 hours per week  
d= Approximately 20-29 hours per week  
e= Approximately 19 or fewer hours per week

**DIRECTIONS for Questions 5 thru 8:** In your experience at Iowa State University this semester, about how often have you done each of the following?

a=two or more times *per week*

b= about once *per week*

c= about once every *couple of weeks*

d= once or twice *this semester*

e=never

(B.E.S.T. participants: In questions about experiences with faculty, this does *not include* your faculty mentor.)

**How often have you.....?**

5. ... asked your instructor for information related to a course you were taking (grades, make-up work, assignments, etc.)?
6. ... visited informally and briefly with an instructor after class?
7. ... made an appointment to meet with a faculty member in his/her office?
8. ... discussed personal problems or concerns with a faculty member?

**DIRECTIONS for Questions 9 thru 17:** If you are now living in a residence hall or fraternity/sorority, about how often have you done each of the following in the residence unit during this semester? Indicate your response by choosing the letter on your response sheet which corresponds to the following options:

- a=two or more times *per week*
- b= about once *a week*
- c= about once every *couple of weeks*
- d= once or twice *this semester*
- e=never

If you do not live in a residence hall or fraternity/sorority, please omit the following 9 items, and go on to question 18.

How often have you.....?

9. ... had lively conversations about various topics during dinner in the dining hall?
10. ... gone out with other students for late night snacks?
11. ... offered to help another student (with course work, errands, favors, advice, etc.) who needed some assistance?
12. ... participated in discussions that lasted late into the night?
13. ... asked others for assistance in something you were doing?
14. ... borrowed things (clothes, tapes, posters, books, etc.) from others in the residence unit?
15. ... attended social events put on by the residence unit?
16. ... studied with other students in the residence unit?
17. ... helped plan or organize an event in the residence unit?

DIRECTIONS for Questions 18 thru 23: Please use the options below.

a= yes, with more than a dozen  
 b= yes, with between 6 and 12  
 c= yes, with between 3 and 5  
 d=yes, with 1 or 2  
 e= no

18. Have you made friends with students whose academic major field was very different from yours?
19. Have you made friends with students whose family background (economic and social) was very different from yours?
20. Have you made friends with students whose race was different from yours?
21. Have you made friends with students whose interests were very different from yours?
22. Have you made friends with students from another country?
23. Have you made friends with students of the opposite gender?
24. To what degree did you feel "welcome" in your place of residence this semester?

a=Very welcome  
 b=Moderately welcome  
 c=A little welcome  
 d=Not welcome

25. To what degree did you feel "welcome" at ISU this semester?

a=Very welcome  
 b=Moderately welcome  
 c=A little welcome  
 d=Not welcome

26. If you could start over, would you attend Iowa State University again?

a= Yes, definitely  
 b= Probably yes  
 c= Probably no  
 d= No, definitely not

27. Would you recommend ISU to a friend who is selecting a college and has interests similar to yours? .

a= Yes, definitely  
b= Probably yes  
c= Probably no  
d= No, definitely not

Students enrolled in B.E.S.T., please answer the remaining three questions that you will find below. Students not enrolled in B.E.S.T., please leave Questions 28 thru 36 blank. Thank you very much for your time. Have a great break!

28. To what degree did you feel "welcome" in B.E.S.T. this semester?

a=Quite welcome  
b=Moderately welcome  
c=A little welcome  
d=Not welcome

29. If you could start over again, would you participate in B.E.S.T. again?

a= Yes, definitely  
b= Probably yes  
c = Probably no  
d= No, definitely no

30. Would you recommend B.E.S.T. to a friend who is selecting ISU for college and has interests similar to yours?

a= Yes, definitely  
b= Probably yes  
c= Probably no  
d=No, definitely not

Thank you very much for your time. Please leave Questions 31 thru 36 blank. Have a great holiday break!

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