Freshman Interest Groups: Creating Seamless Learning Communities to Enhance Student Success

Thomas R. Marrero, Andrew K. Beckett
University of Missouri-Columbia

In 1983 the National Commission on Excellence in Education's *A Nation at Risk* began a call for reform in secondary and higher education. This report claimed that America's education was "being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people."[1]. Several related reports followed. Namely, the Wingspread Group[2] and the Kellogg Commission[3] both charged higher education to redesign the undergraduate experience to better prepare America's citizens for the 21st century. One area that continues to be of concern is the decline of science, math, and engineering (SME) students. "Undergraduate engineering enrollment declined from a high of 441,205 students in 1983 to 356,177 students in 1996, representing a 19 percent reduction."[4] Furthermore, the attrition rate for engineering students remains high. An estimated 35% of first-year engineering students change their major before the start of their sophomore year.[5]

While many in academia are quick to blame poor academic preparation in secondary education for the difficulties that students face in these fields, Seymour and Hewitt found that a loss of interest in the sciences and poor teaching by SME faculty were major concerns for both students who persisted in the field and those who changed academic majors[6]. In his meta-analysis, Daempfle came to a similar conclusion and described the classroom experiences of SME students as "chilly."[7] Seymour and Hewitt suggest that the best way to increase the retention of students in SME fields is to "improve the quality of the learning experience for all students—including those non-science majors who wish to study science and mathematics as part of their overall education."[8] They suggest that institutions focus their efforts on teaching pedagogy, student assessment, advising, and faculty engagement.

FIGs: A Seamless Learning Environment

The concept behind Freshman Interest Groups (FIGs) is simple, yet profound. Implemented at the University of Oregon in 1982, a FIG is a small group (generally 15-20) of first-year students who share a common academic interest. As a group, they are co-enrolled in 3 common courses as well as a one-credit FIG seminar that is co-taught by an upper-class student and a faculty member with similar academic interests. On many campuses the students are also housed in the same residence hall. By living in the same dormitory, taking courses together, and regularly discussing their experiences in a structured first-year seminar, students in FIGs have multiple opportunities to make meaning of their comprehensive undergraduate experience. Their living arrangements and curricular experiences, typically viewed as disjointed collegiate experiences, become complementary forces that help them better focus on their learning and academic success.

Residentially based FIGs are now present at large, research-focused institutions such as the University of Texas at Austin, Penn State University, and Iowa State University as well as regional institutions such as Sonoma State University, Northern Illinois University, and Missouri Western State College. These types of programs, which attempt to integrate the curricular and co-curricular student experiences, are gaining recognition in the mainstream media. In their 2004 rankings of colleges and universities, *U.S. News and World Report* highlighted the potential benefits of such programs by stating that "reform-minded colleges across the country are turning to innovative programs like learning communities and intensive semester-long freshman orientations to engage students in academics and hopefully offer measurable success in the form of higher retention rates and higher graduation rates"[9]

At the University of Missouri-Columbia, residentially-based engineering FIGs have become a major component of the first-year experience. Since the program's inception in 1995, over 1000 engineering students have participated. During the fall semester of 2004, 150 of the 426 (35%) incoming students chose to participate in one of the nine engineering interest groups. Students self-select into the program and typically there is space for all who wish to participate. The Division of Engineering uses the program to recruit women and high ability students by creating specific FIGs for these groups. Using a retention model as a conceptual framework, this paper will attempt to address the impact of this first-year program on the academic success of engineering students.

Conceptual Framework

One of the most widely accepted models for understanding persistence was developed by Vincent Tinto. Tinto's model accounts for both student and institutional variables in understanding student departure and persistence.

> "Broadly understood, it argues that individual departure from institutions can be viewed as arising out of a longitudinal process of interactions between an individual with given attributes, skills, financial resources, prior educational experiences, and dispositions (intentions and commitments) and other members of the academic and social systems of the institution. The individual's experience in those systems, as indicated by his/her intellectual (academic) and social (personal) integration, continually modifies his or her intentions and commitments."[10]

Tinto suggests that pre-college entering academic achievements directly impact persistence. More importantly, each affects departure indirectly through its effect upon "the continuing formulation of individual intentions and commitments regarding future educational activities." [11] Intentions and commitments are key elements of the model. Intention is an important predictor of persistence. "Generally speaking, the higher the level of one's educational or occupational goals, the greater the likelihood of college completion."[12] Tinto defines commitment not only as the student's motivation for success, but also the quality of effort exerted by the student.

While students' entering characteristics obviously influence intention and commitment, it is the experiences within the academic and social systems at the institution that are of interest to those designing residentially-based FIGs. Tinto suggests that a student continually evaluates his or her experiences within the social and academic system. This in turn leads to re-evaluating the student's goals and commitments and through the re-evaluation process, the student decides to remain at the institution or withdraw.[13] Although "integration or membership in the academic or social systems of the college are argued to be conceptually distinct process, they are mutually interdependent and reciprocal."[14] This notion of integrating the social and academic systems is the key concept behind FIGs. "When the cultures of the academic and social systems are supportive of each other, then the two systems may work in consonance to reinforce integration in both the academic and social systems of the institution" and "their interaction may further the institutional goal of retention."[15] Available evidence suggests that these types of programs appear to be successful in helping students academically succeed.

Literature Review

Two quantitative studies conducted at the University of Washington examined the relationship between students who participate in FIGs and retention. The University of Washington's program co-enrolls students in groups of 20 in three courses around a similar theme as well as a one credit-hour FIG seminar. It should be noted that the students in the two studies did not live in the same residence hall and one should be cautious in drawing comparisons between these studies and studies conducted on residentially-based FIGs. Tokuno (1993) studied differences in retention between participants and non-participants for the entering classes of 1988, 1989, and 1990.[16] He found that for all three entering classes, the FIG students were retained at a higher rate than the non-FIG students. He also found that the FIG students were earning credit hours at a faster rate than the non-FIG students. This led him to speculate that that FIG students may graduate at a faster rate than non-FIG students. However, the study did not control for entering ability even though the researcher found that students who enrolled in a FIG had significantly higher ACT composite scores. Tinto and Goodsell-Love also examined retention of FIG students at the University of Washington for the 1991-1993 entering classes.[17] They found that 99.2% of the FIG students were retained for their second semester versus only 95.8% of the non-FIG students (p. 51). Furthermore, FIG students' mean GPA was 3.14 versus 2.98 for non-FIG students (p. 50). Using discriminant analysis, stepwise regression, and logistical regression, they found that these differences were statistically significant even after controlling for entering academic ability and gender.

Another study on retention in FIGs was conducted at the University of Missouri-Columbia in 1995. Pike, Schroeder, and Berry used institutional and survey data to try to explain differences in persistence between participants and non-participants of residentially-based FIGs. Initial assessment found that the freshman to sophomore retention rate was higher for FIG students versus non-FIG students (87% versus 82%). Two of the major findings were that FIGs had a "substantial positive effect on faculty-student interaction" and "positive effects on social integration and institutional commitment."[18]

In addition to the quantitative studies on persistence, several qualitative studies have examined the student experience of participants within FIGs. Using a business residential FIG as a case study, Buss (2002) examined the academic and social experiences of six students at a Midwest public land grant institution. She found that "participants expressed a higher level of self-confidence and felt that they had also become more open minded as a result of their experience."[19] In 1991 and 1992, Goodsell interviewed and observed students in non-residentially-based FIGs at the University of Washington.[20] She found that students in FIGs were able to make strong social connections with fellow members.

While the previous research has provided a better understanding of student experiences within a FIG and its impact on both persistence and academic achievement, questions still remain regarding persistence of various subgroups of students. Given the high attrition rate and decline in enrollment of engineering students, the researchers are particularly interested in the impact of engineering-focused FIGs on academic success, retention, and graduation of students initially interested in the field of study.

This concern with freshmen interest groups (FIGs) for engineering students complements the more general concern of how to increase the quality of undergraduate education and student retention. In the late eighties, Chickering and Gamson neatly outlined "seven principles of good practice in undergraduate education."[21] The principles are based on extensive research, applicable to a wide variety of collegiate programs, and well-serve all types of students (poor/rich, female/male, older/younger, under prepared/well-prepared, black/white, etc.). Chickering and Gamson stipulate that good practice in undergraduate education needs a favorable environment, mainly the responsibility of teachers and students, but also requires the strong support of collegiate/university leaders, government officials, and directors of accrediting associations. Almost twenty years after publication of the "seven principles of good practice in undergraduate education", Kuh, G.D. and associates at the Indiana University Center for Postsecondary Research wrote a detailed account of a multiyear project of 20 carefully selected colleges and universities that assessed practices and conditions that help students succeed in college.[22] This book, published in 2005, is an excellent source of specific information about enhanced college education, including practices and conditions applicable to freshmen engineering students.

Daempfle reported major causes of attrition that affect freshmen engineering students, and first-year college math and science majors. This review refutes some common explanations for high student attrition rates from engineering programs after their first-year in college. Daempfle's research indicates that poorer retention rates arise from higher student dissatisfactions due to: classroom instructional factors, differing high school and college faculty expectations, and certain epistemological considerations. The classroom instructional factors are generally called "the chilly climate hypothesis".

This paper will address three questions. First, controlling for entering academic ability, what is the impact of FIGs on freshman to sophomore retention? Second, controlling for entering academic ability, are there differences in academic achievement between FIG and non-FIG students? Finally, controlling for entering academic ability, what is the impact of FIGs on graduation at both the institutional level as well as within the field of engineering?

FIG retention data from a university comparable to the University of Missouri-Columbia were recently published by Stassen.[24] For instance, both universities are public, Research I, and each has an undergraduate enrollment of 18,000. A comparison of retention results will be provided in the discussion.

Methodology

Institutional data containing all engineering students from the entering class of 2003 was used to measure first-year persistence and academic achievement (as measured by first semester GPA). The 2003 sample included 454 students, of which 131 (32%) were FIG participants. A similar data set for the entering class of 1998 was used to examine academic achievement (as measured by cumulative GPA) and graduation. The 1998 sample included 457 students, of which 120 (26%) were FIG participants. High school rank and ACT Composite scores were used to control for entering ability.

First-year Persistence

For the purposes of this study, the entering class of 2003 was used to measure the differences in freshman-sophomore retention to the institution between FIG and non-FIG participants. 90% of the FIG students were enrolled for their sophomore year whereas just 78% of the non-FIG students enrolled.

Table 1: First-year retention rate for entering engineering class of 2003

FIG	N	% of Total Sum	% of Total N	Retained Percent %
No FIG	323	68.1%	71.1%	78.0
FIG	131	31.9%	28.9%	90.1
Total	454	100.0%	100.0%	81.5

Since both retention and FIG membership are dichotomous variables, logistical regression was used to measure the impact of FIGs on retention. High School Rank and ACT Composite scores were used to account for entering ability. The model accurately predicted 81.8% of the subjects. As seen below, differences between participants and non-participants remained statistically significant at the alpha=0.052 level (note that FIG membership was coded as 0 and non-FIG as 1, which explains the negative beta weight).

Table 2: Logistical regression for retention of entering engineering class of 2003

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1(a)	FIG(1)	- .673	.346	3.780	1	.052	.510
	ACTCOMP	.168	.038	19.042	1	.000	1.182
	HSrank	.013	.005	6.777	1	.009	1.013
	Constant	-3.260	1.109	8.638	1	.003	.038

a Variable(s) entered on step 1: FIG, ACTCOMP, HSrank.

Academic Success of First-year Students

Using the same sample, a one-way ANOVA was used to compare first semester mean GPA between the FIG and non-FIG participants for the entering class of Fall 2003 term. As indicated below in Table 3 and Table 4, although there appears to be a sizeable difference in GPA between the groups, the difference was not statistically significant after accounting for entering ability.

Table 3: Mean first semester GPA for entering engineering class of 2003

Dependent Variable: First GPA

FIG	Mean GPA	Std. Deviation	N
No FIG	2.61740	.954725	308
FIG	2.95940	.870013	125
Total	2.71613	.942917	433

Table 4: Tests of between-subjects effects on GPA for entering engineering class of 2003

Dependent Variable: First GPA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	113.853(b)	3	37.951	60.248	.000	.296	180.743	1.000
Intercept	1.607	1	1.607	2.551	.111	.006	2.551	.357
HSrank	50.663	1	50.663	80.429	.000	.158	80.429	1.000
ACTCOMP	34.583	1	34.583	54.901	.000	.113	54.901	1.000
FIG	.741	1	.741	1.177	.279	.003	1.177	.191
Error	270.235	429	.630					
Total	3578.490	433						
Corrected Total	384.088	432						

a Computed using alpha = .05

b R Squared = .296 (Adjusted R Squared = .292)

Academic Success for Entering Engineering Class of 1998

Similarly, a one-way ANOVA was used to compare the cumulative GPA of engineering students from the entering class of 1998. Interestingly, the differences were statistically significant after accounting for entering ability, as seen in Table 6.

Table 5: Mean cumulative GPA for entering engineering class of 1998
Dependent Variable: Cumulative GPA

FIG	Mean GPA	Std. Deviation	N
Not in Fig	2.68390	.821749	337
Fig	2.92024	.731005	120
Total	2.74596	.804897	457

Table 6: Tests of between-subjects effects on GPA for entering engineering class of 1998
Dependent Variable: Cumulative GPA

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	90.428(a)	3	30.143	66.610	.000	.306
Intercept	.044	1	.044	.096	.756	.000
ACTComp	13.003	1	13.003	28.734	.000	.060
HSRank	40.218	1	40.218	88.873	.000	.164
InFig	2.824	1	2.824	6.240	.013	.014
Error	204.996	453	.453			
Total	3741.330	457				
Corrected Total	295.424	456				

a R Squared = .306 (Adjusted R Squared = .302)

It should be noted that the above analysis contains data for both students who graduated and those that have not graduated and there were no statistical differences in GPA between FIG and non-FIG graduates, as seen in Table 7. Therefore, one can conclude that the differences in academic achievement are more likely related to retention and graduation and not membership in the FIG.

Table 7: Mean GPA of graduates from entering engineering class of 1998
Dependent Variable: Cumulative GPA

FIG	Mean	Std. Deviation	N
Not in Fig	3.08444	.452407	219
Fig	3.16237	.464631	91
Total	3.10732	.456660	310

Table 8: Tests of between-subjects effects on GPA for graduates from entering engineering class of 1998
Dependent Variable: CumGPA

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	15.262(a)	3	5.087	31.657	.000	.237
Intercept	8.231	1	8.231	51.218	.000	.143
ACTComp	3.693	1	3.693	22.979	.000	.070
HSRank	5.474	1	5.474	34.062	.000	.100
InFig	.210	1	.210	1.305	.254	.004
Error	49.176	306	.161			
Total	3057.623	310				
Corrected Total	64.438	309				

a R Squared = .237 (Adjusted R Squared = .229)

Degree Attainment

For the purposes of this study, the entering class of 1998 was used to measure the differences in six-year graduation rates between FIG and non-FIG participants. As seen in Table 9, 76% of the FIG students graduated whereas only 64% of the non-participants graduated.

Table 9: Graduation comparison between FIG and non-FIG for entering engineering class of 1998

FIG	N	% of Total N	% of Total Sum	Percent Graduated
Not in Fig	352	74.6%	71.2%	.64
Fig	120	25.4%	28.8%	.76
Total	472	100.0%	100.0%	.67

Similar to the retention study, logistical regression accounting for ACT Composite scores and high school rank was used to measure the impact of membership in a FIG. The model accurately predicted 71.2% of the subjects. As seen below, membership in a FIG was statistically significant at the alpha=0.049 level. As noted earlier, FIG membership was coded as 0 and non-FIG as 1 which explains the negative beta weight.

Table 10: Logistical regression on graduation for entering engineering class of 1998

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1(a)	InFig(1)	-.493	.250	3.877	1	.049	.611
	ACTComp	.091	.031	8.741	1	.003	1.095
	HSRank	.021	.006	11.680	1	.001	1.022
	Constant	-3.051	.827	13.600	1	.000	.047

a Variable(s) entered on step 1: InFig, ACTComp, HSRank.

Degree Attainment in Engineering Field

Finally, the 1998 entering class was analyzed to determine the impact of FIGs on not only graduation, but graduation within the field of engineering. A nominal regression, using ACT Composite scores and high school rank as covariates, resulted in statistical differences between FIG and non-FIG students degree completion within an engineering field. Tables 11 and 12 provide descriptive statistics which seem to indicate that FIG students are more likely to graduate with an engineering degree. The nominal regression confirmed this finding.

Table 11: Number of engineering degrees awarded for entering class of 1998

	Students Not Graduated	Degrees Awarded Outside Engineering	Degrees Awarded in Engineering	Total
Not in Fig	127	80	145	352
Fig	29	24	67	120
Total	156	104	212	472

Table 12: Percentage of engineering degrees awarded for entering class of 1998

	Degree Awarded			Total
	Not Graduated	Degree Outside Engineering	Degree in Engineering	
Not in Fig	36.1%	22.7%	41.2%	100%
Fig	24.2%	20.0%	55.8%	100%

Table 13: Nominal regression for type of degree

Degree		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Degree Outside Engineering	Intercept	-.189	.276	.470	1	.493			
	[InFig=0]	-.273	.311	.772	1	.380	.761	.414	1.399
	[InFig=1]	0(b)	.	.	0	.	.	.	.
Degree in Engineering	Intercept	.837	.222	14.193	1	.000			
	[InFig=0]	-.705	.253	7.741	1	.005	.494	.301	.812
	[InFig=1]	0(b)	.	.	0	.	.	.	.

a The reference category is: Not Graduated.
b This parameter is set to zero because it is redundant.

Discussion

The results of the study suggest that the Freshman Interest Group program have an impact on the retention of first-year engineering students as well as graduation. Interestingly, the difference in graduation seems to be within the field of engineering. The descriptive statistics indicate that the percentage of FIG and non-FIG participants with a degree outside engineering is relatively the same (20% versus 22.7%). However, the difference between the groups within the field of engineering was substantial (55.8% versus 41.2%). These differences were confirmed via the nominal regression. In terms of academic achievement, it appears that the differences between FIG students and non-FIG students were not significant.

At the University of Missouri-Columbia, data presented in Table 1 indicate that the first year retention rate of engineering students in a FIG was 90% (class of 2003). Recall, these engineering students were not specifically selected, had three courses in common and lived in the same residence hall. The students not in a FIG had a 78% retention. As reported by Stassen, retention results for all first-time, first-year students at the University of Massachusetts-Amherst who were specially selected to be part of a learning community (LC) ranged from 89.7% to 93.7%. For freshmen not in an LC retention percentages were 81.4% and 81.5% (cohorts of 1999 and 2000). These retention results are not from the same type of student sample. However, they are in agreement and independently demonstrate that FIGs, or LCs, have a significant positive impact on freshmen student retention.

While the findings do not explain why the program is impacting graduation and retention, it appears that the reason is not from higher grades during the first semester. Seymour and Hewitt's research suggests that students who persist in the SME fields develop "attitudes or coping strategies" to help them survive the challenges of the undergraduate experience.[24] Not surprisingly, engineering FIGs intentionally create an environment conducive to helping students develop such strategies via peer to peer influences. By living together and taking courses together, engineering students can not only help one another survive the academic challenges associated with SME courses, but they can share their emotional and personal issues with one another as well. Simply put, when a FIG students receives his or her first "C or D" on a calculus exam, he or she has a peer support group to share his or her frustrations and disappointment. Together, the FIG students have the opportunity to co-create a normative value that, as a group, they will find a way to succeed. Additionally, the upperclass engineering student provides the students with a "live-in" academic role-model. This peer not only can help create a community among the FIG but can also serve as proof that one can succeed as an engineering student.

Seymour and Hewitt also noted that survivors in SME fields experience an "intervention by faculty at a critical point in the student's academic or personal life."[25] While this study did not measure the differences in faulty interaction between FIG and non-FIG students, it is clear that there are multiple opportunities for faculty engagement in the FIG seminar course. In addition to the in-class interactions, the program encourages FIG faculty to interact with students outside the classroom. For example, FIG faculty are given a free meal pass which allows them to regularly have lunch in the dining hall with their FIG students. The program also funds various educational and cultural events such as allowing the faculty member to take his or her FIG to a university-sponsored concert or play. In short, the program attempts to create opportunities conducive to building a faculty-mentor relationship between the FIG faculty and first-year students.

Conclusion

Despite the positive results of this study, one should be careful before drawing too many firm conclusions. First, it is important to note that the study was from a single institution. Therefore, one should be careful in generalizing the results. Furthermore, it is important to note that students self-select into the program. While the researchers accounted for entering academic ability, it is possible that FIG students have a higher commitment to both the field of engineering and degree attainment compared to non-FIG students. Tinto's model suggests that higher commitment would lead to higher retention and graduation rates and could explain the differences found in the study. In other words, it is difficult to conclude a causal effect of FIG participation given the complexity of student attrition.

Additional research is needed to examine the impact of such programs on the academic success of female and minority engineering students. Interestingly, the University of Missouri-Columbia now offers both single-gendered and coeducational engineering FIGs. Based on previous research, it is possible that one of the experiences could have a greater impact on retention and graduation. Additionally, socioeconomic class could be a key predictor of graduation that was not accounted for in this study. Finally, despite having key academic indicators, the logistical regression for predicting graduation was only 71.2% accurate. This again demonstrates the complexity of attrition and the need for better understanding the actual student experience. Qualitative research may provide better insight into the "student experience" for engineering FIG and non-FIG participants. In particular, one might be interested in examining the emotional support that FIG members gain from their peer group, student leader, and faculty member. It is possible that these support mechanisms help counter the "chilly" classroom experiences and increase their interest in the field of engineering.

For institutions wishing to improve the undergraduate experience for engineering students, we suggest a self-analysis of specific learning practices as outlined in Kuh, et. al. text. The following questions are designed to help institutions reflect on their commitment to student success:

Are students academically challenged in their coursework? What expectations do faculty have for students? How are these expectations communicated in admission materials, campus visits, and first-year orientation activities?

Is the curriculum structured to promote active and collaborative learning? Is peer to peer learning a normative value in the student culture? To what extent do faculty and students interact both inside and outside the classroom?

What enriching educational experiences exist for students? Are undergraduates involved in research? Do students have opportunities to converse with others who have different backgrounds and belief structures? Are there structured opportunities for community service?

[1] National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform*. Washington, D.C.: U.S. Government Printing Office, p. 1.
[2] Wingspread Group on Higher Education. (1993). An American imperative: higher expectations for higher education. Racine, WI: Johnson Foundation.
[3] Kellogg Commission of the Future of State and Land Grant Universities. (1997). Returning to our roots: The student experience. Washington, DC: NASULGC.
[4] *Higher education in science and engineering* (n.d.) retrieved December 3, 2003, from http://www.nsf.gov/sbe/srs/seind98/access/c2/c2s3.htm
[5] Seymour, E. & Hewitt, N. (1997). *Talking about leaving*. Boulder, Co: Westview Press, p. 3.
[6] Seymour, E. & Hewitt, N., p. 32.
[7] Daempfle, P.A. (2003). An analysis of the high attrition rates among first year college science, math, and engineering majors. *Journal of College Student Retention 5* (1), 37-52.
[8] Seymour, E. & Hewitt, N., p. 394.
[9] *How will you learn?* (n.d.). retrieved March 28, 2004, from http://www.usnews.com/usnews/edu/college/articles/brief/04programs_brief.php
[10] Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago: The University of Chicago Press, pp. 114-115.
[11] Tinto, V., p. 114.
[12] Tinto, V., p. 38.
[13] Tinto, V., p. 115.
[14] Tinto, V., p. 119.
[15] Tinto, V., p. 119.
[16] Tokuno, K. (1993). Long term and recent student outcomes of freshman interest group program. *Journal of the Freshman Year Experience*, *5* (2), 7-28.
[17] Tinto, V. & Goodsell-Love, A. (1993). A longitudinal study of freshmen interest groups at the University of Washington. *National Center for Postsecondary Teaching, Learning, and Assessment*, December 28, 1993.
[18] Pike, G. R., Schroeder, C. C., & Berry, T. R. (1997). Enhancing the educational impact of residence halls: The relationship between residential learning communities and first-yearcollege experiences and persistence. *Journal of College Student Development*, 38, p. 617.

[19] Buss, Paulette (2002). Understanding freshman students' experiences living in a residential learning community: A single case study. *Dissertation Abstracts International. Volume: 63* (*07*), 2473A, p. 211
[20] Goodsell, Anne (1993). Freshmen Interest Groups: Linking social and academic experiences of first-year students. *Dissertation Abstracts International, 54 (*08), 2909A.
[21] Chickering, A.W. & Gamson, Z.F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, *39* (7), 3-7.
[22] Kuh, G.D., Kinzie, J., Schuh, J.H., Whitt, E.J., & Associates. (2005). *Student success in college: Creating conditions that matter*. San Francisco: Jossey-Bass.
[23]Stassen, M.L.A. (2003). Student outcomes: The impact of varying living-learning community models. *Research in Higher Education, 22*(5), 581-613.
[24] Seymour, E. & Hewitt, N., p. 30.
[25] Seymour, E. & Hewitt, N., p. 30.

Special Note: This paper is a continuation of research which was first presented at the ASEE 2005 Annual Conference in Portland, Oregon.

TOM MARRERO is Professor of Chemical Engineering at the University of Missouri-Columbia. He received his B.S. in Chemical Engineering from the Polytechnic Institute of Brooklyn in 1958, and his M.S. in Chemical Engineering from Villanova University in 1959. In 1970, he received his Ph.D. degree in Chemical Engineering at the University of Maryland. He currently serves as a faculty mentor for an engineering FIG.

ANDREW BECKETT is the coordinator for the Freshman Interest Group Program at the University of Missouri-Columbia. He received his B.S. in Mathematics from Truman State University in 1994, and his M.A. in Higher Education in 1996 from the University of Arizona. He is currently a doctoral student in the Department of Educational Leadership and Policy Analysis at the University of Missouri-Columbia.