

## **The First-Year Seminar as a Means of Improving College Graduation Rates**

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*Abstract:* This study of 1,700 students was designed to determine whether college graduation rates of entering students enrolled in a first-year seminar during academic years 1991 through 1994 at a medium-sized, public Midwestern university significantly differed from those of a matched comparison group not enrolled in the seminar. Analysis indicated significantly greater graduation rates for those enrolled in the seminar. Logistic regression analysis of the results identified high school decile, high school class size, seminar, and ACT scores as factors impacting graduation rates, and an interaction was found between decile and seminar, and school size and seminar. Further investigation of the interaction suggests that the effect of the seminar was greatest for students from the middle to lower high school deciles and minimal for the students from the uppermost high school decile.

The percentage of college students who earn a bachelor's degree within five years is declining at an alarming rate and has now reached an all-time low (ACT Newsroom, 2000). Moreover, there is growing concern regarding the number of students leaving higher education without completing a degree (Astin, Tsui, & Avalos, 1996; Cuseo, 1991). Astin (1993) reported that the four-year college graduation rate for the best academically

prepared students is 80%, but only 10% for the least academically prepared. Studies indicate that more than half of all students who enter college leave prior to degree completion (Astin, et. al., 1996; Tinto, 1993) with graduation at public, open-enrollment, four-year institutions at a mere 30.3% (ACT Newsroom, 2000). In the interest of both the student and the institution, it becomes imperative to understand the mechanisms that influence and support successful achievement of graduation.

Interest in the experience of first-year college students has grown considerably during the past two decades due to a number of issues facing higher education. Universities are placing increased emphasis on first-year seminars as a means of integrating students both academically and socially during the very important first year of college. According to Gardner (1986), the emphasis on the first-year experience is based on the concept that success during the first year provides the foundation on which the rest of the college experience is based. Student learning and satisfaction are fostered in an environment where "things happen by design, not by accident or spontaneity, i.e., those things that must happen if students are more likely to be successful" (Gardner, 1986, p. 267).

The history of the first-year seminar has been traced to the 1880s, and the popularity of such courses has grown; Barefoot, Warnock, Dickinson, Richardson, and Roberts reported in 1998 that more than 70% of accredited undergraduate institutions offer first-year seminars. Many studies indicate the value of first-year seminars in increasing student retention; the most comprehensive of these was conducted by Fidler (1991) at the University of South Carolina. In addition, research confirms a significant positive impact of the first-year seminar on grade point averages for students completing such a course compared with those who do not (Davis, 1992; Donnangelo, 1985; Glass & Garrett; 1995; House & Kuchynka, 1997). However, few studies have investigated the impact of such a seminar on graduation rates (Boudreau & Kromrey, 1994; Dale & Zych, 1996; Goldman & Gillis, 1989; Shanley & Witten, 1990; Young, 1982). Thus, demonstrating a significant interaction between graduation and the first-year seminar is an area open to further investigation.

This study was designed to determine whether college graduation rates of entering students enrolled in a first-year seminar during academic years 1991 through 1994 at a medium-sized, public, Midwestern university significantly differed from those of a matched comparison group not enrolled in the seminar. If significant differences occurred in graduation rates, which variables contributed to that significance?

The first-year seminar at the institution being studied incorporated campus orientation, academic success, personal learning styles, time management, goal setting, stress management, responsible decision-making techniques, and career planning. These issues were addressed within a supportive environment defined by small class-size and caring instructors.

### **Methodology**

This single institution study employed a longitudinal research methodology. Multiple cohorts from academic years 1991 through 1994 were selected on the basis of their pre-enrollment characteristics and their participation in the seminar. Each seminar participant was matched with a nonparticipant on the basis of pre-enrollment characteristics of American College Testing (ACT) composite scores, high school rank, size of high school graduating class, and classification of academic major. Results were examined at the end of the 1999 academic year so that each class had the opportunity to have completed five years of college. Multiple cohorts over five years and coordination of class environment across cohorts by use of a similar syllabus and instructor communication reduced the possibility of misdiagnosis due to a one-time anomaly or "cohort effect."

### *Subjects*

During the fall semester of academic years 1991 through 1994, entering students were given the opportunity to enroll in an academic skills seminar. Computerized lists were produced of students who had voluntarily enrolled in the academic skills seminar and those who did not enroll in the seminar. Established

parameters required that students included in the study must have entered with zero credits, been full-time students taking a minimum of 12 credits, and been in the traditional student age range of 17 to 21 years of age.

### *Procedure*

Each student in the seminar meeting the criteria of age and classification was identified by computer search of the university administrative data base. A list of these students was generated on the basis of descending ACT scores, high school class percentile rank, size of high school graduating class (small  $\leq 50$ , medium 51-150, large  $> 150$ ), and academic major.

Choice of the criteria used for defining the students was determined based on research linked to college success. According to numerous studies (Astin, 1993; Mouw & Khanna, 1993; Pantages & Creedon, 1978), ACT or SAT scores and high school GPA are the best indicators of college success. For this study, ACT scores were used because they are the score required for admission by the university being studied. High school class percentile rank was used instead of high school GPA in an attempt to control for effects of school size, composition, rigor, or grade differentiation among schools.

Although literature regarding high school class size is limited and somewhat inconclusive (Cashen, 1970; Clements, 1969), high school class size was used as a match criterion due to the large differences among the size of high school graduating classes in the upper Midwest. Pantages and Creedon (1978) report that while the research is inconclusive or negates the issue of high school size, there is some evidence that graduates of very small high schools are more likely to drop out of college.

Choice of major was included in the items used for the match, and academic major designation was separated into two classifications based on the general education math requirement. While most first-year requirements are similar across majors as determined by the general education requirements, the math requirements tend to be distinct and specific for students enrolling in the College of Engineering and the College of Science

and Math.

*Matched Comparison Group*

Based on the same parameters of age and classification, a computer search generated a list of students not registered for the seminar. Once again, these students were listed in descending order according to ACT scores, high school class percentile rank, size of high school graduating class, and academic major by math requirement.

The two lists were manually matched according to the criteria identified. This match was made during 1991, 1992, 1993, and 1994 and determined the two groups that served as the basis for the study (Table 1). The numbers of students in each group are not identical because some students had missing data for one or more of the non-matching variables and were subsequently dropped, leaving us with a total of 1,700 students.

Table 1.

*Distribution of Students Among Groups and Cohorts*

Cohort	Match Group	Seminar Group	Total
1991	49	48	97
1992	249	252	501
1993	248	246	494
1994	302	306	608

*Variables*

Independent variables in this study consisted of group membership (seminar students or matched comparison group who met the criteria of age, new-student status, and full-time enrollment), gender, ACT composite scores, high school rank, and high school class size. The dependent variable was graduation.

### *Data Analysis Methods*

Data for the seminar students and the matched comparison group were obtained from archived records for students who entered the university as new students during the fall terms of 1991 through 1994. All subjects were assigned a unique numeric identifier in order to maintain confidentiality. The data set included, in addition to cohort year, information on gender, ACT composite scores, high school class rank, and high school class size. The final data set of 1,700 students comprises about 52% males and 48% females. More than 90% of the students are from North Dakota or Minnesota, with another 5% from South Dakota and Wisconsin. The school size distribution of these students shows about 35% coming from small schools ( $\leq 50$  students in high school graduating class), about 25% from medium-sized schools (51 to 150 students in graduating class), and about 40% from large schools ( $> 150$  students in high school graduating class).

College graduation data were obtained for all of the above students. Graduation was defined as official notification by the Office of the Registrar of degree completion. Graduation rates were determined for students completing graduation requirements in four or fewer years and again for students completing graduation requirements in five or fewer years.

We took two basic approaches in analyzing these data. In the first approach, we used simple chi-square tests (Snedecor & Cochran, 1980) to determine whether graduation rates for students who took the seminar differed significantly from those students in the matched group after four years and again after five years. The second approach involved the construction of logistic regression models using gender, seminar, cohort year, ACT Composite score, school size, and high school decile as possible predictors of graduation success. High school decile was constructed to standardize student performance by controlling for variation in the size of the high schools students had attended. Decile was determined by dividing a student's high school class rank by their high school class size, subtracting this value from 1, and multiplying the result by 100. The resulting number was rounded to the nearest integer value in order to represent the

class percentile. Values of 90 and above were assigned to decile 10 and represent roughly the top 10% of the students in each high school. Values between 80 and 89 were assigned to decile 9 and represent the next best 10% of the students in each high school. The distribution of the students across the 10 deciles obtained in this manner is provided in Table 2.

Table 2.

*Distribution of Students Among Deciles (10=Best, 1=Worst)*

Decile	Frequency	Percent
10	185	10.88
9	235	13.82
8	257	15.12
7	250	14.71
6	235	13.82
5	192	11.29
4	162	9.53
3	92	5.41
2	70	4.12
1	22	1.29

According to SPSS Regression Models (1999), logistic regression is useful for situations in which an investigator wants to predict the presence or absence of a characteristic or outcome based on values of a set of predictor variables. It is similar to linear regression but is appropriately used in models where the

predictor and criterion variables are categorical in nature. When dealing with such data, logistic regression works with proportions instead of means. The results are presented in terms of an odds ratio which is a measure of the relative odds, when compared to a reference group, of achieving a particular outcome from a particular variable. In this study, the odds ratio represents the odds of graduating for the seminar group divided by the odds of graduating for the matched comparison group. Logistic regression coefficients can be used to estimate odds ratios from each of the independent variables in the model. Independent variables examined in this study were the seminar, ACT composite score, cohort year (1991, 1992, 1993, and 1994), gender, decile, and high school class size. Logistic regression was used because the dependent variable in this study, graduation, is binary (graduated within five years or did not graduate within five years).

Hosmer and Lemeshow (2000) discuss several model-building strategies for logistic regression including purposeful selection of variables, stepwise selection of variables, and best subsets selection. We followed their description of purposeful selection of variables because it allows the data analyst the opportunity to apply some common sense intuition within an objective framework for model building. Prior to arriving at our final model, we confirmed parts of the purposeful selection process using stepwise and best subsets methods.

The first step in purposeful selection involves assessing the importance of each of the independent variables through separate univariate logistic regressions. We have six effects (seminar, gender, ACT composite score, high school size, decile, and cohort) which require a total of eight independent variables because cohort is a nominal variable requiring 3 dummy variables to code its 4 levels ( $D91 = 1$  for students in the 1991 cohort, otherwise  $D91 = 0$ ;  $D92 = 1$  if in the 1992 cohort, otherwise  $D92 = 0$ ;  $D93 = 1$  if in the 1993 cohort, otherwise  $D93 = 0$ ). Variables meeting the modest significance level of  $\alpha = .25$  in the univariate regressions were combined into a multivariable logistic regression model. One can relax the  $\alpha$ -level even further or rely on best subsets methods if one is concerned about screening out variables that might not be significant on their own but may be important when included in a

multivariable model. Significance levels for individual parameter estimates in the multiple logistic regression were compared to a more stringent  $\alpha = .05$  with the least significant variables being considered as candidates for removal. Variables were removed one at a time with Likelihood Ratio chi-square statistics based on the change in the  $-2 \log$  likelihood for adjacent models in the hierarchy being used to determine the importance of each effect. The 3 dummy variables coding cohort were treated as a group in this process so all are removed or added in one step.

Once a main effects logistic regression model was identified, all possible two-factor interactions were added to the model one at a time. Again,  $p$ -values for individual Likelihood Ratio chi-square statistics were compared to  $\alpha = .05$ . Interaction terms meeting this significance level were subsequently added to the model. Interaction terms close to this alpha level were considered carefully with the decile by seminar interaction being deemed of great enough merit to continue to include it. The model remaining at this time was identified as our final model and subsequent inferences were based on an examination of the properties of this model. All model fitting was performed using Proc Logistic in SAS/STAT (SAS Institute, 1999).

Log odds of graduation rates were plotted against selected independent variables to verify assumptions and to validate the final logistic regression model.

## Results

### *Graduation*

Of the 852 students in the seminar group, 142 (16.67%) graduated in four years. The four year graduation rate for the match group was 11.79% (100 out of 848). We rejected the null hypothesis that these two graduation rates are equal using a chi-square test ( $\chi_1^2 = 8.27, p = .004$ ). This significant difference in graduation rates was repeated for students graduating in five years or less. Just under 40% of the seminar group students (340 of 852 or 39.91%) versus just over 32% of the match group students (272 of 848) graduated within five years. A test for the

equality of these two rates across the groups also led to a rejection of the null hypothesis ( $\chi^2 = 11.31, p = .0008$ ).

### *Logistic Regression Models*

Having observed differences in graduation rates when comparing seminar participants with a matched comparison group, we attempted to determine if other possible explanatory variables might modify our interpretation. This led to the construction of logistic regression models.

The purposeful selection method of Hosmer and Lemeshow (2000) begins with an assessment of each of the potential independent variables in separate univariate logistic regressions. Results for the six independent variables available in this data set are provided in Table 3. Notice that all six variables meet the relaxed criterion level of  $\alpha = .25$  for inclusion into the multivariable model, the next phase in the model building process.

An assessment of the Wald  $\chi^2$  values for each variable using  $\alpha = .05$  for retention in the multivariable model suggests several candidates for removal including cohort, gender, and ACT Composite (Table 4). We removed these variables one at a time and compared the coefficients of the remaining independent variables before and after each removal. Marked changes in coefficients at any step would suggest that a specific independent variable was needed to provide an adjustment to the effect of a variable remaining in the model. All of the coefficients remained stable throughout this process so we were left with seminar, decile, and high school size as potential independent variables at this stage of the model building process.

The final steps in building a model through purposeful selection involve assessing the linearity of the logits for continuous variables and assessing potential interaction among the independent variables.

Figure 1 allows assessment of the relationship between log odds of graduation and high school performance expressed as decile. The overall pattern is one of increasing graduation rates with improved high school performance. This plot suggests the relationship is reasonably linear so no additional transformation is required.

Table 3.  
*Univariate Logistic Regressions for Graduation within Five Years*

Variable	$\hat{\beta}_0$	$\hat{\beta}_1$	$\psi$ (95% CI)
Intercept Only	- .5754		
Gender	-.7049	.2674	1.307
Seminar	-.7503	.3409	1.406
Decile	-2.5697	.2919	1.339
D91 (1991)		-.6662	0.514
D92 (1992)	-.5603	-.0096	0.990
D93 (1993)		.0731	1.076
ACT Composite	-3.1007	.1179	1.125
HS Size	.0267	-.2955	0.744

Variable	-2 log L	L.R.	$\chi^2$	<i>p</i> -value
Intercept only	2221.6			
Gender	(1.071, 1.593)	2214.6	6.98	.0082
Seminar	(1.153, 1.716)	2210.3	11.33	.0008
Decile	(1.274, 1.407)	2069.2	152.40	<.0001
D91 (1991)	(0.311, 0.850)			
D92 (1992)	(0.774, 1.267)	2212.7	8.96	.0297
D93 (1993)	(0.842, 1.375)			
ACT Composite	(1.093, 1.158)	2154.1	67.57	<.0001
HS Size	(0.663, 0.835)	2196.2	25.47	<.0001

$\hat{\beta}_0$  = estimated parameter for the intercept

$\hat{\beta}_1$  = estimated parameter for variable in the univariate logistic regression model

$\psi$  = estimated odds ratio for variable with 95%

Confidence Interval in parentheses.

$\chi^2$  = test statistic for comparison of model with variable and intercept to model with intercept alone. These tests all have 1 degree of freedom except for cohort which has 3 df.

*p*-value = probability level associated with the Likelihood Ratio  $\chi^2$  test.

Table 4.

*Multivariable Logistic Regression Model Results for Graduation within Five Years*

Variable / Effect	$\hat{\beta}$	$se(\hat{\beta})$	Wald $\chi^2$	$p$ -value $\psi$
Intercept	-2.6084	.3822	46.58	<.0001
Gender	.1364	.1100	1.54	.21471.146
Seminar	.3873	.1071	13.07	.00031.473
Decile	.2593	.0311	69.32	<.00011.296
D91 (1991)	-.3660	.2746	1.78	.18260.694
D92 (1992)	-.0416	.1329	0.10	.75400.959
D93 (1993)	-.0655	.1331	0.24	.62300.937
ACT Composite	.0244	.0183	1.77	.18321.025
HS Size	-.2342	.0619	14.30	.00020.791

$\hat{\beta}$  = parameter estimate for variable or effect

$\psi$  = estimated odds ratio from multiple logistic regression model

At this point, Hosmer and Lemeshow (2000) suggest investigating the possible interactions among the variables that have survived the selection process to this point. We tried all possible two-variable interactions and determined that two were potentially significant: seminar by decile and seminar by high school class size (Table 5).

Figure 2 illustrates the seminar by decile (S\*D) interaction. Notable features of this figure include the apparent divergence of the seminar and match groups for the lower deciles (2, 3, 4) and the nicely parallel profiles for the middle to upper deciles (5, 6, 7, 8, and 9). The top and bottom deciles (1, 10) show very small

differences between the seminar and match groups. The lowest deciles are represented by the smallest numbers of students so one may expect their behavior to be more erratic. This may partially explain why the S\*D interaction is less important than the other terms in the final multivariable model.

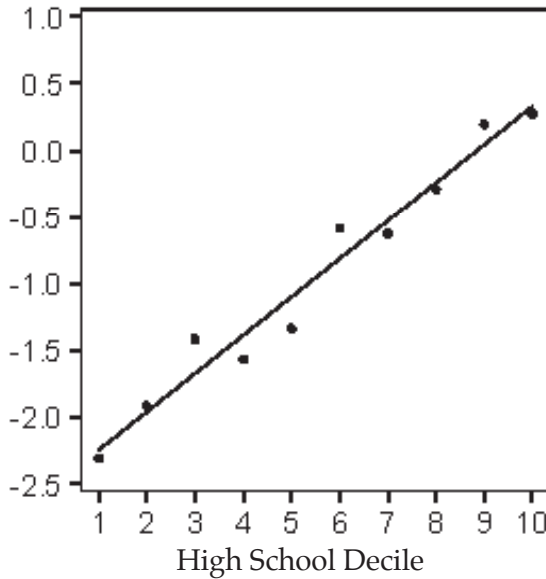


Figure 1: Log odds of the observed graduation rates for the 1,700 students plotted against high school decile. The pattern is roughly linear implying no additional transformation is required. As a frame of reference, log odds values of -1.5, 0, and 1 represent graduation rates of 18%, 50%, and 73%, respectively.

The seminar by high school class size interaction is shown in Figure 3. The logit of -0.50 for the small school students who did not take the seminar equates to a graduation rate of about 38%. The corresponding graduation rate for the small school students who took the seminar was about 52% (logit = .1089). The differences in the logits for the medium-sized schools translates into about an 8% higher graduation rate for the students who took the seminar (35% versus 27%) while the difference in

Table 5.  
*Final Multivariable Logistic Regression Model Results for Graduation within Five Years*

Variable / Effect	$\hat{\beta}$	$se(\hat{\beta})$	Wald $\chi^2$	<i>p</i> -value	$\hat{\psi}$
Intercept	-2.9427	.3555	68.52	<.0001	
Seminar	1.6540	.4677	12.51	.0004	5.228
Decile	.3356	.0385	75.89	<.0001	1.399
Seminar*Decile	-.0862	.0516	2.79	.0947	0.917
HS Size	-.0689	.0902	0.58	.4448	0.933
Seminar*HS Size	-.3245	.1241	6.84	.0089	0.723

$\hat{\beta}$  = parameter estimate for variable or effect

$\hat{\psi}$  = estimated odds ratio from multiple logistic regression model

graduation rates for the large school students is minimal (32% versus 31%, respectively). In all cases the graduation rate is higher for the seminar group; however, the effect appears to be large for students from small schools, while almost non-existent for students from large schools. This differential impact of the seminar is responsible for the statistically significant seminar by school size interaction in the final logistic regression model. Unlike the seminar by decile interaction, each of the seminar by school size combinations is represented by at least 200 students, so small sample sizes are unlikely to be responsible for perceived unusual behavior.

The apparent interaction between high school size and seminar may be difficult to explain. At least part of this effect is probably associated with the fact that the students from the

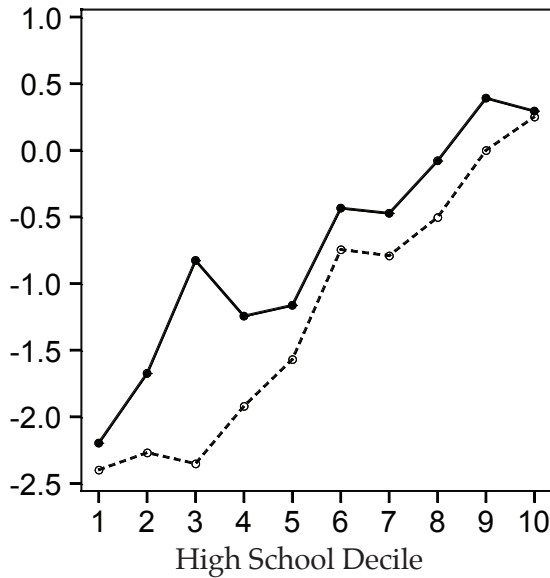


Figure 2: Log odds of graduation rates after 5 years for the seminar group (solid line) and match group (dashed line) for 1,700 students plotted against decile. The apparently different behavior of deciles 2 through 4 compared to deciles 5 through 9 probably contributes to the seminar by decile interaction.

smaller schools may tend to be better students as shown by the fact that about 30% of the students from small schools were in deciles 9 and 10. By comparison, about 25% of the students from the medium-sized schools and only about 20% of the students from large schools were from deciles 9 and 10. Thus, for this particular data set, there may be some confounding of school size and high school performance that may at least account for this unexpected result. This potentially represents a three-way interaction among seminar, school size, and decile. We did attempt to test this three-way interaction, but the results were not significant. Small cell sizes for some of the three-way combinations make assessments by inspection difficult as well.

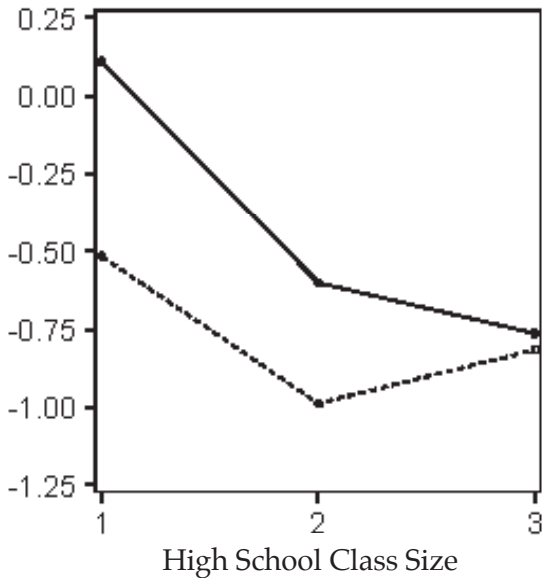


Figure 3: Log odds of graduation versus small (1), medium (2), and large (3) high school graduating classes illustrating the significant interaction between seminar group and class size. The difference between the log odds for the seminar (solid line) and match (dashed line) group for small and medium schools is about .5 units, or roughly a 12-15% greater graduation rate for the seminar students.

### Discussion

This longitudinal study views the continuing impact of the first-year seminar into the fourth and fifth year of college. Prior literature has a limited number of studies describing the impact of the first-year seminar beyond the third semester (Boudreau & Kromrey, 1994; Dale & Zych, 1996; Goldman & Gillis, 1989; and Shanley & Witten, 1990). Results from this study indicate that students entering the target university during the academic years 1991 through 1994 who enrolled in a first-year seminar graduated at a higher rate than did a matched comparison group. Given the goal of higher education, the amount of money spent on student recruitment, and public perceptions, it is to the university's

advantage to retain students to graduation. In addition, parents and students are concerned about the student's potential for success, and supporting that success is imperative on the part of both public and private institutions. Data supporting increased earning power and lower unemployment rates for college graduates (Gladieux & Swail, 2000; Hecker, 1995; Mittelhauser, 1998) help drive the increased emphasis on successful completion. With demographic trends indicating a more diverse and smaller pool of high school graduates, retention to college graduation becomes more critical as the needs of our nation increasingly require an educated citizenry. Increased access and increased matriculation are not enough. Increased graduation rates should be the ultimate goal.

Investigating variables that lead to improved potential for graduation will provide guidance in admission practices. When admission decisions include the desire to admit a student population that will be successful to graduation, this study supports the understanding that a student's entering characteristics play an important role in success to graduation. However, that potential for success can be increased with the addition of a first-year seminar. Results of this study indicate that those entering at a disadvantage may statistically increase their odds of graduation by involvement in a first-year seminar. In addition, a realistic assessment of the odds of graduating allows a student to share in the decision of where or whether to attend college and, once the student has decided to attend, to choose opportunities that will enhance successful completion.

This study helps answer the question of how institutions can explain and increase graduation rates. In regard to the impact of the first-year seminar on eventual graduation, this study explored an outcome with limited prior study. The odds of graduation were greater for students who took the first-year seminar when compared to those who did not. Obviously, many factors impact a student between the first semester and the time of graduation. Stampen and Cabrera (1986) indicate that pre-college ability characteristics predicted persistence more accurately for the first year of college than for later years. The current study also notes that students entering with high ACT scores and high decile ranking

demonstrate higher graduation rates four and five years later. The discovery by the current study that significant interaction exists between the first-year seminar and the pre-enrollment characteristic of high school decile, while no such interaction exists between ACT and decile or seminar and ACT, is a discovery that helps to explain student success to graduation.

An important focus on the first-year seminar may be made when one notes the increased odds of graduation for students entering college from the lower high school decile. Currently, the methods of determining college admission are changing. The Texas Legislature passed House Bill 588 requiring public universities in Texas to automatically accept any applicant from the top 10% of any public or private high school class in the state of Texas, regardless of academic preparation (Benatovich, 1999). A similar top 4% plan has been established in California, while a top 20% plan has been proposed in Florida (Selingo, 1999).

The Educational Testing Service (ETS) has proposed a “strivers” approach to admissions. The strivers model provides a statistical basis for identifying and accepting motivated applicants whose test scores and grade point averages have been depressed based on factors such as race and ethnicity, family socioeconomic status, school socioeconomic status, with low proportion of college-bound students, urban or rural location, region, age, and core course GPA. Students from an identified background lacking required SAT scores but exceeding the historical average for students from similar backgrounds by at least 200 points would be considered strivers and accepted by competitive institutions (Cooper, 1999). These are examples of students with the potential of entering the university at a disadvantage. Results of the current study indicate that students entering with the lower decile can estimate their odds of graduation and potentially improve those odds by enrolling in a first-year seminar. In addition, during an era of limited financial resources when institutions must make careful allocations of resources, results indicate that while such seminars improve graduation rates for all students, those entering with a lower high school decile will receive the most benefit from the seminar.

As access to higher education has increased, graduation rates

are being scrutinized. According to Gladieux and Swail (2000), "Public policy has done a fairly good job of facilitating initial entry into the system of postsecondary education. Now, we need to do a better job of promoting persistence and completion" (p. 689). It is in the interest of both society and the academic community to produce successful college graduates.

As professionals dedicated to achieving the full potential for student success, it is imperative that faculty and administrators continually search for means by which such potential can be predicted and achieved. This study has shown that the first-year seminar provides a means of improving student success, retention, and eventual graduation for all students.

### *Limitations*

No attempt was made to delineate students on the basis of race, gender, course load, or motivation. The decision was based on prior work at other institutions as well as the demographics at the current institution. In extensive retention studies of participants versus nonparticipants in the first-year seminar, University 101, between 1973 and 1988 at the University of South Carolina, Fidler (1991) examined the variables of academic ability, race, gender, course load, and motivation. He found that none of these accounted for the differences in retention between participants and nonparticipants. Similar studies (Davis-Underwood & Lee, 1994; Glass & Garret, 1995; Hoff, Cook, & Price, 1996; Pantages & Creedon, 1978; Strumph & Hunt, 1993) also support such findings within a variety of contexts. Further, the minority population at the institution studied was less than 3%, subjects were limited to traditional-aged students with full-time status, and gender proved to be approximately equal by chance, thereby decreasing these as confounding factors. Motivation of students at the time they enter and take the first-year seminar is measured by the Cooperative Institutional Research Program (CIRP) survey administered to all entering students. Results indicated that approximately 97% of entering students expect to graduate from the institution with a bachelor's degree, indicating that motivation of both participants and nonparticipants is high at the time of the seminar.

### *Recommendations for Further Research*

This study provides insight into the longitudinal impact of the first-year seminar and adds increased understanding to a growing field of knowledge. However, this study is limited to one public, four-year institution in the Midwest. The data bank is somewhat circumscribed due to limited information retrievable from archived university records. Valuable information could be gained by repeating this investigation proactively. An increased database providing for more variables would increase the value of the study. Data relating to family financial support are lacking as well as issues impacting student success such as high school curriculum, extracurricular activities, socioeconomic status, and parental education. In addition, the student body at this institution is very ethnically homogeneous, thereby limiting the investigation. With an increasing non-traditional student population both in terms of age and ethnic background, it would be valuable to determine whether all populations are best served by such a seminar and whether such a model proves predictive of success among other populations. In addition, the apparent interaction between high school size and seminar should be investigated further. With the potential for a three-way interaction with seminar, school size, and decile, a larger cell size would have the potential for confirming or negating such an interaction.

As institutions look for ways to improve the odds that all students will achieve graduation, this study suggests that the first-year seminar serves as one means to that end. It is only one step, but it is an early intervention and an important first step.

### **References**

ACT Newsroom. (2000, February 16). National college dropout and graduation rates, 1999. [Online], <http://www.act.org/news/releases/2000/02-16b00.html> [2000, February 18].

Astin, A. W. (1990). Retention-rate data mislead student 'consumers.' *Chronicle of Higher Education*, 37(12), p. B2(1).

Astin, A. W. (1993). *What matters in college? Four critical years revisited*. San Francisco: Jossey-Bass.

Astin, A. W., Tsui, L., & Avalos, J. (1996). *Degree attainment rates at American colleges and universities: Effects of race, gender, and institutional type*. Los Angeles: Higher Education Research Institute, UCLA.

Barefoot, B. O., Warnock, C., Dickinson, M., Richardson, S, & Roberts, M. (Eds.). (1998). *Exploring the evidence: Reporting outcomes of first-year seminars, Vol. II* (Monograph No. 25). Columbia, SC: University of South Carolina, National Resource Center for The First-Year Experience and Students in Transition.

Benatovich, T. P. (1999). The gateway program: Fostering academic success at the University of Texas at Arlington. *The Journal of College Orientation and Transition*, 6(2), 28-30.

Boudreau, C. A., & Kromrey, J. D. (1994). A longitudinal study of the retention and academic performance of participants in freshmen orientation course. *Journal of College Student Development*, 35(6), 444-449.

Cashen, (1970). High school size as a factor in college academic success. *Journal of Secondary Education*, 45(6), 256-259.

Clements, W. H. (1969). A third look at high school size: Academic success of entering freshmen for 1965, 1967, and 1968 by class size category. (ERIC Document Reproduction Service No. ED 033 664)

Cooper, K. J. (1999, October). Admissions models for inclusion. *Black Issues in Higher Education*, 34-35.

Cuseo, J. B. (1991). *The freshman orientation seminar: A research-based rationale for its value, delivery, and content* (Monograph No. 4). Columbia, SC: University of South Carolina, National Resource Center for The Freshman Year Experience.

Dale, P. M., & Zych, T. (1996). A successful college retention program. *College Student Journal*, 30(3), 354-360.

Davis, B. O., Jr. (1992). Freshman seminar: A broad spectrum of effectiveness. *Journal of the Freshman Year Experience*, 4(1), 79-94.

Davis-Underwood, M., & Lee, J. A. (1994). An evaluation of the University of North Carolina at Charlotte freshman seminar. *Journal of College Student Development*, 35(6), 491-492.

Donnangelo, F. P. (1985). Freshman orientation and career development: How effective is it. *Journal of College Placement*, 45, 23-24.

Fidler, P. P. (1991). Relationship of freshman orientation seminars to sophomore return rates. *Journal of the Freshman Year Experience*, 3(1), 7-38.

Gardner, J. N. (1986). The freshman year experience. *College and University*, 61(4), 261-274.

Gladieux, L. E., & Swail, W. S. (2000). Beyond access: Improving the odds of college success. *Phi Delta Kappan*, 81(9), 688-691.

Glass, J. C., Jr., & Garrett, M. S. (1995). Student participation in a college orientation course, retention, and grade point average. *Community College Journal of Research and Practice*, 19(2), 117-132.

Goldman, B. A., & Gillis, J. H. (1989). Graduation and attrition rates: A closer look at influences. *Journal of the Freshman Year Experience*, 1(1), 65-77.

Hecker, D. E., (1995). Further analyses of the labor market for college graduates. *Monthly Labor Review*, 118(2), 39-43.

Hoff, M. P., Cook, D., & Price, C. (1996). The first five years of freshman seminars at Dalton College: Student success and retention. *Journal of the Freshman Year Experience*, 8(2), 33-42.

Hosmer, D.W., & Lemeshow, S. (2000). *Applied logistic regression* (2nd ed.). New York: John Wiley & Sons.

House, J. D., & Kuchynka, S. J. (1997). The effects of a freshmen orientation course on the achievement of health sciences students. *Journal of College Student Development*, 38(5), 540-541.

Mittelhauser, M. (1998). The outlook for college graduates, 1996-2006: Prepare yourself. *Occupational Outlook Quarterly*, 42(2), 3-10.

Mouw, J. T., & Khanna, R. K. (1993). Predictions of academic success: A review of the literature and some recommendations. *College Student Journal*, 27(3), 328-336.

Pantages, T. J., & Creedon, C. F. (1978). Studies of college attrition: 1950-1975. *Review of educational research*, 48(1), 49-101.

SAS Institute Inc. (1999). *SAS/STAT user's guide, Version 8*. Cary, NC: SAS Institute Inc., p. 943.

Selingo, J. (1999, Dec 3). A quiet end to the use of race in college admissions in Florida. *The Chronicle of Higher Education*, p. A31-32.

Shanley, M. G., & Witten, C. H. (1990). University 101 freshman seminar course: A longitudinal study of persistence, retention, and graduation rates. *NASPA Journal*, 27(4), 344-352.

Snedecor, G.W. and W.C. Cochran. 1980. *Statistical Methods* (7th ed.). Ames, IA: The Iowa State University Press.

*SPSS Regression models 9.0.* (1999). Chicago, IL: SPSS Inc.

Stampen, J. O. & Cabrera, A. F. (1986). Exploring the effects of financial aid on attrition. *The Journal of Student Financial Aid*, 16, 28-40.

Strumpf, G., & Hunt, P. (1993). The effects of an orientation course on the retention and academic standing of entering freshmen, controlling for the volunteer effect. *Journal of the Freshman Year Experience*, 5(1), 7-14.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: The University of Chicago Press.

Young, R. W. (1982). Seventeen year graduation study of 1963 freshmen at the University of New Mexico. *College and University*, 57(3), 279-288.

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