Research Notes

Office of Research and Evaluation
February 1, 1991

Summary of Eight Years of Retention, Transfer, and Graduation Data for GC Students

To better understand the trends in retention, transfer, and graduation among General College students in the last decade, data were pulled from the University of Minnesota eight-year Retention Data Base and the **1990 Student Retention Summary**, an annual compilation of statistics generated by Dr. Ron Matross and Mr. Steve Des Jardins in Data and Reporting Services. Additionally, the Higher Education Coordinating Board (HECB) provided ORE with rates of transfer of recent GC students to other postsecondary institutions in the state by accessing their annual enrollment data base.

The attached tables profile the retention and graduation (baccalaureate level) of all new high school students in GC cohorts from 1982 through 1989 (the statistics for advanced standing students are not included). They show the percent of all GC students retained in the College after one and two years (p. 1), and for students of different ethnic backgrounds after one, two, and three years (pp. 2-4). Cumulative graduation rates (i.e., percent of students who graduate from the University with a baccalaureate degree six years after matriculation) are given for all groups combined, as well as for separate ethnic groups (p. 5). Enrollment in other University units (Twin Cities Campus) after one, two, and three years are provided (pp. 1-5), as are cumulative within-University transfer rates for the past eight cohorts (p. 6). Finally, cumulative transfer rates *outside* the University are provided for three recent cohorts (i.e., 1986, 1987, and 1988) (p. 7).

Primary Findings

* In looking at the one- and two-year retention rates for all GC students over the past eight years (see p. 1), it appears that retention has remained fairly consistent. Not much change in the percentages of returning and nonenrolled students is seen, despite the significant changes in College mission and curriculum that occurred in 1986-88. As the figures illustrate, about one-third of the cohorts fail to return to the University one year after matriculation; less than 10% are enrolled elsewhere within the University, and the

rest are enrolled in General College. Two years after matriculation, about one-half of the students fail to enroll in the University; between 14% and 18% are registering in other units on campus, and the rest are enrolled in General College. (Note: these "enrollment in other units" figures vary from ORE's "one-year transfer" estimates published previously because ORE's data were cumulative--they included students who transferred but did not enroll that particular fall quarter--and they included advanced standing students as well.)

* Retention rate varies across ethnic groups (see pp. 2-4.) The rates have been fairly steady over the last eight years for the larger groups, such as the Caucasians (N = approximately 650), but show greater fluctuation for the smaller groups, such as the Chicano/Hispanics (N = approximately 24). The highest retention rates during this time period were achieved by Asian students, the lowest rates by American Indian students. For example, after one year, typically only about 20% of the Asians have left the University, compared to about 55% - 60% of the American Indians. Both the fluctuation of retention within ethnic groups, and the rank order pattern of retention differences across the ethnic groups, mirror the same pattern of data seen throughout the University (see Matross and DesJardins, **Research on University of Minnesota Students**, Research Summary No. 4, January 15, 1991).

* Graduation rates after six years (see p. 5) are roughly 11% for all groups combined. The percent of students graduating with a baccalaureate degree varies across the ethnic groups. Highest graduation rates during this time period for these cohorts were achieved by Asian students, the lowest rates by American Indian students. For example, 32% of Asian students from the class of 1982, 20% of those from the 1983 cohort, and 19% of those from the 1984 cohort had graduated as of 1990. No American Indian student who entered General College during 1982, 1983, or 1984 has since graduated with a baccalaureate degree.

* Cumulative transfer rates within the University appear to reach their highest level (30%) after about three years (see p. 6). Even the earliest cohorts studied (i.e., 1982 and 1983) had cumulative transfer rates (as of 1990) of 32% and 33%, respectively. One positive finding is the relatively strong within-University transfer rate of students in our 1988 cohort. After only two years, 29% of the new high school students in this cohort have transferred. Perhaps this indicates some impact of the Base Curriculum, which was implemented in the College in 1988.

* A second positive finding is the surprisingly high rate of transfer of students outside of the University to other postsecondary systems in the state (see p. 7). As many as 24% of the students from the 1986 cohort, for example, have since enrolled in other institutions. This means that, combined with the 28% from that cohort who transferred within the University, over half the students from 1986 have found ways to continue their education, whether at General College, some other unit on the Twin Cities campus, or in other schools. Considering the challenges facing these students, this figure is encouraging. Of the six possible systems into which student might transfer, community colleges appear to represent the system of choice, with 44% of all students (from these cohorts) choosing those sites.

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February 8, 1991

Retention of General College Students* in the Last Eight Years

One Year After Entry
by Cohort (Year of Matriculation)

Fall Enrollment Status	1982 (N=977)	1983 (N=946)	1984 (N=1031)	1985 (N=1001)	1986 (N=847)	1987 (N=888)	1988 (N=933)	1989 (N=850)
	%	%	%	%	%	%	%	%
Percent of students who registered in GC	55	56	63	60	61	58	60	62
Percent of students who registered in other U of M Units	8	7	6	3	5	5	3	4
Percent of students who were not enrolled	37	37	32	37	34	38	36	34

Two Years After Entry
by Cohort (Year of Matriculation)

Fall Enrollment Status	1982 (N=977)	1983 (N=946)	1984 (N=1031)	1985 (N=1001)	1986 (N=847)	1987 (N=888)	1988 (N=933)
	%	%	%	%	%	%	%
Percent of students who registered in GC	29	31	31	29	33	25	26
Percent of students who registered in other U of M units	17	17	16	14	14	15	18
Percent of students who were not enrolled	54	52	53	57	54	59	56

* Students counted were New High School (NHS) students only; New Advanced Standing (NAS) students were not included.
Source: 1990 Student Retention Summary. R. P. Matross, S. L. Des Jardins, Data and Reporting Services 12/20/90.

Retention of General College Students

One Year After Entry: by Ethnic Group and Cohort (Year of Matriculation)

Fall Enrollment Status	1982 (N=977)	1983 (N=946)	1984 (N=1031)	1985 (N=1001)	1986 (N=847)	1987 (N=888)	1988 (N=933)	1989 (N=850)
	%	%	%	%	%	%	%	%
Percent of students who registered in GC								
Caucasian	57	58	64	60	62	58	65	64
Asian American	64	74	80	79	61	74	72	75
Chicano/Hispanic	63	50	55	57	60	17	36	67
American Indian	46	36	38	44	48	46	33	46
African American	53	64	65	48	67	61	44	53
Percent of students who registered in other U of M units								
Caucasian	8	8	6	3	5	5	3	5
Asian American	17	11	8	5	12	5	3	6
Chicano/Hispanic	4	11	7	4	13	0	7	0
American Indian	0	0	3	0	0	0	0	0
African American	3	3	0	3	2	3	3	2
Percent of students who were not enrolled								
Caucasian	35	35	30	36	33	37	32	31
Asian American	18	15	13	16	27	21	24	19
Chicano/Hispanic	33	39	38	39	27	83	57	33
American Indian	55	64	59	56	52	54	67	55
African American	44	33	35	49	31	36	53	45

Retention of General College Students

Two Years After Entry: by Ethnic Group and Cohort (Year of Matriculation)

Fall Enrollment Status	1982 (N=977)	1983 (N=946)	1984 (N=1031)	1985 (N=1001)	1986 (N=847)	1987 (N=888)	1988 (N=933)
	%	%	%	%	%	%	%
Percent of students who registered in GC							
Caucasian	33	34	34	30	34	26	27
Asian American	19	29	24	29	24	35	31
Chicano/Hispanic	33	32	24	35	33	4	25
American Indian	27	14	15	24	32	25	17
African American	30	41	34	17	31	23	23
Percent of students who registered in other U of M units							
Caucasian	15	18	15	13	13	17	20
Asian American	51	43	39	29	30	22	31
Chicano/Hispanic	11	14	17	13	13	9	11
American Indian	0	0	3	4	4	0	6
African American	4	6	7	7	9	10	9
Percent of students who were not enrolled							
Caucasian	51	49	51	57	53	57	53
Asian American	30	28	38	42	46	43	38
Chicano/Hispanic	56	54	59	52	53	87	64
American Indian	73	86	82	72	64	75	78
African American	65	53	59	77	60	67	69

Retention of General College Students

Three Years After Entry: by Ethnic Group and Cohort (Year of Matriculation)

Fall Enrollment Status	1982 (N=977) %	1983 (N=946) %	1984 (N=1031) %	1985 (N=1001) %	1986 (N=847) %	1987 (N=888) %
Percent of students who registered in GC						
Caucasian	18	15	15	12	12	11
Asian American	5	5	3	13	6	8
Chicano/Hispanic	7	29	10	26	0	0
American Indian	18	4	0	12	4	4
African American	12	17	10	8	9	6
Percent of students who registered in other U of M units						
Caucasian	20	22	20	16	20	24
Asian American	51	54	46	29	38	34
Chicano/Hispanic	15	11	28	13	13	13
American Indian	0	4	9	12	12	8
African American	11	15	22	12	16	21
Percent of students who were not enrolled						
Caucasian	63	63	65	73	68	65
Asian American	43	42	51	56	56	58
Chicano/Hispanic	78	61	62	61	87	87
American Indian	82	93	91	76	84	88
African American	77	68	68	81	75	73

Cumulative Graduation Rates of General College Students Six Years After Entry

By Ethnic Group and Cohort (Year of Matriculation)

Groups	1982 (N=977)		1983 (N=946)		1984 (N=1031)	
	N	%	N	%	N	%
Caucasian	81	(13)	76	(12)	81	(11)
Asian American	33	(32)	17	(20)	18	(19)
Chicano/Hispanic	1	(4)	2	(7)	3	(10)
American Indian	0	(0)	0	(0)	0	(0)
African American	4	(4)	3	(4)	5	(5)
International	0	(0)	2	(18)	3	(30)
Ethnicity not identified	0	(0)	0	(0)	2	(4)
All groups combined	119	(12)	100	(11)	112	(11)

Cumulative Transfer Rates of General College Students Within the Twin Cities University of Minnesota Campus

Year of Entry	Number of Students in Cohort	Number and Percent of Students Who Transferred
Fall, 1982	977	308 (32%)
Fall, 1983	946	315 (33%)
Fall, 1984	1032	347 (34%)
Fall, 1985	1001	280 (28%)
Fall, 1986	846	251 (28%)
Fall, 1987	888	256 (30%)
Fall, 1988	932	180 (29%)
Fall, 1989	850	34 (04%)

Figures are based on New High School students (NHS) who enrolled in day school any term after entry in a unit other than General College. In most cases, this would indicate a transfer to a four-year degree granting unit, but the figures do include people who transferred to a two-year unit (i.e., Waseca) or who registered in another unit as Adult Specials or as Summer Only students. Registrations in other units that were completely cancelled were not counted. Transfers occurred any time between the term immediately following entry into GC and 11/15/90.

Source: Extract file from the Retention Reporting Data Base (created 11/15/90) by J. Kellogg. Data and Reporting Services.

Transfer Rates of General College Students to Postsecondary Campuses Outside of the Twin Cities, U. of M. Campus

Postsecondary System	Cohort 1986 (N=911) N	(%)	1987 (N=941) N	(%)	1988 (N=981) N	(%)	Row Total N	(%)
Community College	85	(09)	68	(07)	38	(04)	191	(44)
Private College	29	(03)	19	(02)	2	(00)	50	(12)
Private Vocational	34	(04)	25	(03)	6	(01)	65	(15)
State University	34	(04)	23	(02)	10	(01)	67	(15)
Technical College	30	(03)	16	(02)	7	(01)	53	(12)
UM, Non-TC Campus	5	(01)	1	(00)	4	(00)	10	(02)
Total Transfer Rate for Cohort	217	(24)	152	(16)	67	(07)	436	(100)

Source: Higher Education Coordinating Board (HECB); A. Djurovich, 12/18/90.

Figures are based on New High School students (NHS) who began in General College fall of 1986, 1987, or 1988. Transfer to another postsecondary system is recorded by HECB through an annual student enrollment reporting mechanism. Because this reporting is done only for fall admits, these figures underestimate the total number of transfers outside of General College (i.e., winter and spring transfers are not included). Multiple transfers by single individuals are not included in this table.

Research Notes

Office of Research and Evaluation

July 1, 1991

Last year, the University's Student Support Services unit decided to participate in the American College Testing's (ACT) Prediction Research Service. This service, which is available for free to all member institutions, analyzes the contribution that students' ACT scores makes (along with high school rank, high school GPA, and locally defined indicators) to the prediction of first-year GPA and grades in specific English, math, and social science courses in that institution.

As part of the project, the University sent to ACT the first-year cumulative GPAs of all 1989-90 GC freshmen who did not withdraw in their first quarter (N = 467) who submitted an ACT record. Grades from the student's first GC English course, first GC math course, and the GPA from all GC social science classes taken in the first quarter were submitted, as well as a subset of data from the student's admissions file (i.e., high school percentile rank, number of math units taken in high school, highest math grade in high school, and GC math placement test score). The results of ACT's analyses (which were quite detailed) were shared with ORE in December. Although the results concern the "old" ACT test,* I thought they would still be important to review, given the renewed interest in Student Services for making use of pre-admissions data for counseling purposes.

When reviewing the attached tables, please note that the reported mean composite score (18.3, *sd* = 3.10) is considerably higher than the mean reported earlier by delMas (1989) for 1989-90 students (mean = 15.5, *sd* = 4.23). The discrepency is not an error, nor does it represent an actual difference of ability between this subset of students and all students (N = 510) who submitted ACT scores that year. ACT's Research Service transformed these scores, which were taken from the "old" ACT, so they would be comparable to scores from the "new" ACT (Enhanced) scale. Ron Matross, from Student Support Services, reports that scores in the bottom third of the scale range are most affected by the conversion, and that we can expect to see higher means starting this year, now that applicants are submitting scores from the Enhanced version. This means that scores from previous years cannot be compared to current and future years, unless a concordance table is used. The conversion of scores from one scale to another does not affect the correlation data presented in this report.

Following the attached tables, I offer some brief comments on the significance of the findings.

* Note: Student Support Services repeated their participation in the research service for the 1990-91 cohort of students, most of whom would have taken the "new" ACT assessment. The results of ACT's latest predictive studies will therefore be available to us again in late fall.

Table 1

ACT Norms for 1989-90 GC Freshmen with 1st Year College GPAs

(Source: Table LI-1.1, ACT Prediction Research Services Report)

(N = 467)

Score on ACT	English Subtest f	English Subtest % rank	Math Subtest f	Math Subtest % rank	Composite Score f	Composite Score % rank
36	0	99	0	99	0	99
35	0	99	0	99	0	99
34	0	99	0	99	0	99
33	0	99	0	99	0	99
32	0	99	0	99	0	99
31	0	99	0	99	1	99
30	0	99	0	99	0	99
29	2	99	0	99	0	99
28	3	99	0	99	2	99
27	15	99	4	99	2	99
26	0	96	1	99	2	99
25	20	96	7	99	4	99
24	27	91	0	97	11	98
23	0	86	10	97	12	95
22	44	86	25	95	21	93
21	38	76	33	90	52	88
20	35	68	23	82	34	77
19	44	61	55	78	92	70
18	34	51	54	66	54	50
17	36	44	29	54	66	39
16	34	36	97	48	37	24
15	52	29	53	27	21	16
14	18	18	33	16	32	12
13	28	14	28	9	9	5
12	10	8	3	3	7	3
11	9	6	10	2	6	2
10	8	4	0	1	0	1
9	9	2	0	1	1	1
8	0	1	0	1	0	1
7	0	1	0	1	0	1
6	0	1	0	1	0	1
5	0	1	0	1	0	1
4	0	1	0	1	0	1
3	0	1	0	1	0	1
2	0	1	0	1	0	1
1	0	1	0	1	0	1

	English	Math	Composite
Mean	18.3	17.4	18.3
SD	4.32	3.19	3.10

Note: The "Old" ACT contained four subareas. The ACT Prediction Research Service report did not include Reading and Science Reasoning Subscores in the norms.

Table 2

Bivariate and Multiple Correlations between ACT Scores and College Grades
(Source: Table T-1.3, ACT Prediction Research Service Report)

ACT Score	College 1st English GPA	College 1st Math GPA	College Social Science GPA	College 1st Yr GPA
English subscore	.15	.19	.25	.21
Math subscore	.05	.14	.00	.10
Composite score	.06	.10	.26	.13
Multiple correlation (all 4 ACT subscores)	.15	.21	.25	.21
Standard error of est.	.92	1.18	1.00	.82
Number of Students	345	353	76	467

Table 3

Intercorrelations of ACT Scores and High School Grades
(Source: Table T-1.2, ACT Prediction Research Service Report)

(N=467)

	ACT Math	ACT Comp.	HS English	HS Math	HS Soc.St.	HS Science	HS GPA
ACT English	.32	.71	.29	.01	.22	.04	.17
ACT math		.66	.02	.19	.08	.13	.15
ACT composite			.11	.02	.18	.08	.14
HS English				.24	.40	.23	.69
HS math					.18	.36	.62
HS social studies						.37	.73
HS natural science							.70

Table 4

Bivariate and Multiple Correlations of High School Grades with College Grades
(Source: Table T-1.4, ACT Prediction Research Service Report)

HS GPAs, by subject	College 1st English GPA	College 1st Math GPA	College Social Science GPA	College 1st Yr GPA
English	.23	.17	.28	.33
Math	.04	.19	.11	.13
Social science	.14	.16	.15	.22
Natural science	.16	.17	.07	.16
Multiple correlation (all four subject GPAs)	.26	.26	.24	.31
Standard error of est.	.90	1.17	.98	.78
Number of students	345	353	76	467

Table 6

Multiple Correlation Coefficients:
Predicting College GPAs from Four ACT Subscores
and High School Subject GPAs, Separately and Combined
(Source: Table H-1 ACT Prediction Research Services Report)

College GPA	N	ACT Tests R	ACT Tests SeEst	HS GPAs R	HS GPAs SeEst	ACT & HS GPA R	ACT & HS GPA SeEst
English course GPA	345	.15	.92	.26	.90	.28	.89
Math course GPA	353	.21	1.18	.26	1.17	.30	1.14
Social science GPA	76	.25	1.00	.29	.98	.35	.93
Cum 1st year GPA	467	.211	.82	.35	.78	.38	.77

Table 6

Bivariate and Multiple Correlations Between College GPAs and Local Predictors, ACT Scores, and High School Grades
(Source: Table H-3, ACT Prediction Research Service Report)

Local Predictors	College 1st English GPA	College 1st Math GPA	College Social Science GPA	College 1st Yr GPA
HS % rank	.15	.23	.08	.22
# of HS math units	.04	.15	.10	.07
Highest HS math grade	.01	.07	.04	.03
GC math placement score	.06	.12	.05	.09
Local Predictors & ACT				
HS % rank & ACT	.22	.31	.26	.30
# of HS math units & ACT	.17	.23	.26	.21
Highest HS math grade & ACT	.17	.20	.20	.23
GC math placement score & ACT	.13	.22	.24	.20
Local Predictors, ACT, & HS GPA				
HS % rank, & ACT, & HS GPA	.28	.30	.33	.37
# of HS math units, & ACT, & HS GPA	.28	30	.35	.38
Highest HS math grade, & ACT, & HS GPA	.28	.30	.34	.38
GC math placement score, & ACT, & HS GPA	.27	.30	.35	.37
Number of Students	345	353	76	467

Table 7

Comparison of College GPAs and Mean ACT Composite Scores of Students With and Without Core Preparation for College*
(Source: Table H-4, ACT Prediction Research Service Report)

Students With Core Preparation

Student Group (enrollment)	N	College GPA	Mean ACT
1st English course	144	2.76	18.5
1st math course	151	2.72	18.5
Social science course	34	1.59	19.2
1st year cum GPA	199	2.28	18.8

Students Without Core Preparation

Student Group (enrollment)	N	College GPA	Mean ACT
1st English course	186	2.66	17.7
1st math course	184	2.50	17.7
Social science course	35	1.80	18.1
1st year cum GPA	244	2.24	17.9

* Note: Core Preparation was defined by ACT as completing in high school 4 years of English, 3 years of math, 3 years of social studies, and 3 years of natural sciences.

Notes and Comments

1. Table 1, which shows frequency distributions, percentile rankings, means and standard deviations for two of the four ACT subtests and for the composite ACT score, illustrates that the variability of ACT scores is low and the range is restricted. Most students scored within the middle third of the test (14 to 24). A typical standard deviation is about 1/5 of the range; thus, a healthy standard deviation for the composite score scale (which runs from 1 to 36) would be about 7.00 (rather than 3.10). Greatest variability is seen with the English subtest (*sd* = 4.32). Limited variability means that the test score will have limited predictive ability.

2. In Table 2, the bivariate and multiple correlation coefficients are discouragingly low. Simply stated, there is little association between subscores (alone or in combination with eachother) with college GPAs in three subject areas or with first-year cumulative college GPA. The standard error of estimates for all the coefficients are high. This means that using ACT scores to predict college GPAs would contain a lot of error. For example, if a student's predicted GPA after one year was 2.50 (based on the regression equation generated by all four ACT subscores), we could be confident only 68% of the time that his/her actual GPA would be within a range of 2.50 plus or minus .82, or between 3.32 and 1.65. In about one-third of the cases, the student's actual GPA would be either higher than 3.32 or lower than 1.68. Not only is a GPA of 3.32 substantively different from a GPA of 1.68 , we would be wrong 32% of the time.

3. Table 3 indicates that ACT English subscores are correlated to a considerable degree with the ACT composite score (r = .71), as is ACT math (r = .66), but contrary to what one might expect, neither of these subscores is associated with high school grades. High school grades are reasonably associated with a student's high school GPA. These findings do not provide much support for the supposition that ACT is an achievement test (rather than an aptitude or ability test), because it doesn't appear to be very sensitive to students' degrees of accomplishment in the traditional subject areas (as measured by grades).

   For reasons that are not especially clear, the same correlations for UM freshmen in CLA and IT were notably higher (in the .30 to .56 range); this is a phenomenon that seems to occur whenever we compare correlation coefficients between traditional predictors and college achievement of GC students with those of students in other colleges (see delMas, 1989, Predicting College Academic Performance from Precollege Measure of Academic Ability for Twelve Freshman Admitting Colleges at the University of Minnesota). Limited variability and restricted range in the predictor, and in the criterion used (i.e., grades), may be one source of explanation.

4. To get an indication of the predictive ability of high school grades, Table 4 shows the results of single and multiple correlations. As with Table 2, generally weak associations between high school and college GPAs are seen as well as unacceptably high standard errors of estimate.

5. Because researchers generally find that prediction accuracy can be improved by adding more variables, even weak ones, ACT ran multiple regression analyses to predict college GPAs by ACT subtests and high school subject GPAs, separately and combined. As Table 5 shows, using four subtest scores and four subject GPAs did improve the correlation coefficient (R = .38) for cumulative first year GPA, but these measures alone still leave a lot of unaccounted variance in the predicted achievement of students.

6. In Table 6, the locally defined predictors were added one at a time in to the multiple regression analyses. Unfortunately, neither high school percentile rank, number of math units taken in high school, students' highest math grade in high school, or the GC math placement score contributed much to the prediction of college GPAs. Prediction accuracy was improved by adding ACT scores to the equation, and improved again when HS GPA was included, but not significantly beyond what was obtained in the previous analysis with ACT and HS GPA alone. Please note that this finding does not invalidate the GC placement test; that instrument may still be quite useful for its designated purpose (i.e., helping to select the most appropriate first math course for students). This analysis simply demonstrates that a student's math score on the GC math placement test does not help predict his/her GPA after one year.

7. Perhaps the most promising finding appears in Table 7, which compares the mean performance on the ACT and on college GPA of students who have taken a traditional college preparatory curriculum in high school versus those who have not. This "local predictor," which had been suggested by Student Support Services, is also being used in a study ORE is conducting this summer on the predictive validity of certain admissions data. While the differences between the college GPAs of the two groups is small, it is in the expected direction and it is consistent across English, math, and cumulative GPA (it is reversed in social science). The differences between mean ACT scores are also in the expected direction and consistent across all four score areas.

In conclusion, the findings regarding the utility of ACT scores, high school percentile rank, and high school grades for prediction are consistent with earlier findings produced by delMas (1989) and Perry (1990). Correlation coefficients are low, and lower than they are for students in other colleges. In a report on the factors which influence the accuracy of predicting college grades by College Entrance Examination Board (CEEB) researcher L. Baird (1983), the most important factor named was "the extent of variation of the academic ability of the students (p. 1)." In that IT and Fine Arts also had small student populations and somewhat limited variability (delMas, 1989), other factors obviously play a part in the lack of prediction. According to Baird's report:

> *Other research has shown that the predictability of grades is also affected by the heterogeneity of the academic programs of colleges. That is, the more diverse the curricula in terms of major fields, divisions, colleges, and so forth, the less predictable are grades (Munday, 1970). In addition, the less homogeneous the college experience, the less predictable the grades. For example, grades at urban colleges enrolling many part-time and working*

students might be less predictable simply because these students' academic performance can be affected by many influences other than the institution's program. Munday (1970) found that grades at colleges with students living in college-controlled residences were more predictable than grades at colleges with commuting students, and Ramist (1980), after controlling for the size of the test standard deviation, found that grades in small colleges were more predictable that those in large colleges. It might also be expected that colleges with core curricula would have higher correlations than colleges with completely elective systems.

Some characteristics of colleges that have been found to be related to the prediction of grades do not have very clear-cut explanations. For example, some studies have shown that the grades of four year college students are more predictable than those of community college students, the grades of students in private colleges more predictable than those in public colleges, and the grades of students in high-cost institutions more predictable than those in low-cost institutions.

Finally . . . the range of the criteria [on which grades are awarded at the college] is related to predictability. Not only is the standard deviation of the grades awarded related, but also such factors as the percentage of pass/fail courses allowed students, policies on dropping courses, whether low grades can be expunged from the academic record by repeating a course, and so on. That is, the smaller the range of grades awarded and the less homogeneous and reliable the basis upon which the grade averages are based, the lower their predictability. [Furthermore, Breland (1979) and Werts, Linn, and Joreskog (1978) report single year GPA reliability coefficients of about .60, which clearly limit the size of any (validity) coeficient.]

In sum, the size of the correlation between admissions tests such as the SAT and grades is influenced by many factors that have nothing to do with the intrinsic validity of the tests themselves. Some of these factors, such as the range of scores, have clear statistical explanations; some, such as the percentage of students in college-controlled housing, have sociological explanations; and some, such as the percentage of women in the class, do not have clear explanations although they can have a marked effect on predictability. Whatever their underlying mechanism, these factors can appreciably increase or reduce the size of the correlation between test scores and grades.

Studies such as those conducted and summarized by Baird suggest that the predictive valdity of the ACT will always be low for a college such as GC, unless or until such time as (a) all students take the test (in which case, variability would conceivably increase); (b) uniform, norm-based grading practices are shared among faculty; and (c) certain grading policies which restrict the range of grades are changed (e.g., allowing late withdrawal or change F's to I's). Some of these changes are neither desirable or practical.

Meanwhile, it appears to me that ACT data has very limited utility for counseling purposes. A higher score is generally better, yes. A higher score probably

indicates that a student is better prepared cognitively for academic work, or at least better able to perform in test situations on sample questions involving reading, computation, and problem-solving. But whether the student will actually perform better in GC classrooms, as measured by grades, is another question. Similarly, higher high school GPAs and percentile ranks are better than lower GPAs and ranks; beyond that, we can say very little. Perhaps it's time for a new approach to evaluating readiness *to perform* in college; such a measure would ideally include some measure of motivation, ability to commit time towards study, commitment to an educational or career goal, and perhaps financial support.

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Research Notes

Office of Research and Evaluation

August 2, 1991

How valid and useful are traditional indicators for assessing "quality" in higher education institutions? This question was the basis for a research study conducted on a set of national data collected by U.S. News & World Report (Schmitz, 1991). The results, which were shared in a Research Forum May 13, 1991, remain timely for GC faculty and staff as we talk with each other and with external constituencies about the meaning of indicators such as average ACT score of the freshman class, retention and graduation rates.

Background. The study described briefly here addresses the question, Are the indicators currently being used by U.S. News & World Report equally valid for four different categories of higher education institutions? Most of the literature examining reputational rank and other indices of quality have focused on selective, private colleges or graduate departments in research universities (Lawrence & Green, 1980; Conrad & Blackburn, 1985; Tan, 1986). Thus, most of the studies draw on indicators (such as college acceptance rates, students' high school class rank, library resources, faculty publications) that are relevant for the missions of these institutions. Few studies have tried to define quality in undergraduate institutions that draw from a regional student body, have a teaching orientation, or pursue multiple missions. Nonetheless, many of the same indicators proved effective in research on nationally selective graduate institutions are also used to rank undergraduate regional schools. In this study, the validity of eight common indicators is assessed for 595 schools which were categorized, based on the Carnegie classifications (1987), into four groups: national universities (N = 189), national liberal arts colleges (N = 135), midwestern regional liberal arts colleges (N = 130), and northeastern regional universities and colleges (N = 141).

The Indicators. According to measurement theory (Messick, 1988), an indicator may be considered valid if it corresponds to other measures of the same construct or predicts an external, accepted criterion. Validity evidence further accummulates if an indicator does not relate or correspond to variables believed extrinsic to the construct of interest. Eight quality indicators, and two variables believed to be neutral or unrelated to quality, were used to test these assumptions about the interrelationships of indicators, and the relationship of indicators to reputational rank. Institutional data for the eight quality indicators and two neutral variables were published in **American's Best Colleges, 1990** (Elfin, 1989) and are listed on the following page:

Student Ability (Input)

1 College acceptance rate
2 Mean entrance test score (ACT, SAT)
3 High school class standing

Faculty & Instructional Quality (Process)

4 Faculty/student ratio
5 Percent of faculty with a PhD
6 Instructional budget per student

Outcome Indicators (Outcomes)

7 Retention rate
8 Graduation rate

Neutral Variables

9 Percent men in freshman class
10 Cost of room and board

The Reputational Score. As a proxy for "quality," reputational rank or score has been criticized by researchers and policy analysts alike on philosophical as well as technical grounds (Dolan, 1976). Astin (1985) speaks of it as "perceived" quality, rather than the actual value added to student learning as a result of the college experience. The U.S. News & World Report reputational ranking methodology, while leaving much to be desired, does overcome some of the criticisms aimed at earlier rankings in that raters evaluated institutions that were most similar to their own (and thus more familiar, reducing potential halo effects), and multiple types of audiences (not just deans or faculty) contributed to the assessments.

Reputational scores were calculated by U.S. News & World Report based on ratings obtained from national surveys mailed to presidents, academic deans, and admissions directors at every institution in the four categories. Respondents rated each institution within their own category as being in the top (highest) quartile of quality, the upper or lower middle quartiles, or the lowest quartile of quality. If respondents were not familiar enough with the institution to rate it, they were to mark "Don't Know." Response rates to the survey varied from a high of 74% (national liberal arts colleges) to a low of 56% (national universities).

Analyses. A series of descriptive statistics, intercorrelations, and multiple regression analyses were run to study the relationship of indicators with each other and with reputational score within each of the four institutional categories. The major findings are summarized below.

1. **In general, the indicators representing student ability (especially the average entrance test score of freshmen) were the best predictors of a school's reputation.** To a lesser extent, student ability indicators also predicted a school's retention rate, and to an even lesser extent, a school's graduation rate.

2. **Student ability indicators were much less effective, however, in predicting reputation in midwestern regional and northern regional colleges and universities than in national universities and national liberal arts colleges.** For example, the single order correlation between mean

entrance test score and reputational score was .70 for national universities, .84 for national liberal arts colleges, but only .45 for midwestern regional liberal arts colleges.

3. **Student ability indicators were even less effective in predicting retention and graduation rates in the midwestern and northern regional schools (compared to the national schools), to the point of being useless.** The single order correlation between college acceptance rate and graduation rate, for example, was exactly .00 for midwestern regional schools.

4. **The set of indicators, as a whole, was better at predicting reputation ("perceived quality") than actual educational outcomes, such as retention and graduation rates.** About 64% of the variance in national universities' reputations, for example, could be explained by five indicators (entrance test score, high school class standing, instructional budget per student, retention rate, and acceptance rate). Only 53% of the variance in retention rate could be explained (by four variables: entrance test score, acceptance rate, percent of faculty with a PhD, and cost of room and board), and only 32% of the variance in graduation rate could be explained (by three variables: class standing, acceptance rate, and percent of faculty with a PhD).

5. **The set of indicators, as a whole, was better at predicting reputation, retention, and graduation rates in the national schools than in regional institutions.** About 38% of the variance in midwestern regional schools' reputation could be explained (by four variables: retention rate, entrance test score, percent of faculty with a PhD, and instructional budget). Only 23% of the variance in retention rate could be explained (by two variables: entrance test score and percent of men in the freshman class), and only 12% of the variance in graduation rate could be explained (by two variables: class standing and entrance test score).

6. **While two of the process indicators (percent of faculty with a PhD and instructional budget per student) made statistically significant contributions to predicting reputation, retention, and graduation, they were less powerful than student ability predictors and their effect was largely confined to the national universities and liberal arts colleges.** The degrees of association between the remaining process indicator (faculty student ratio) and all three dependent variables were minimal to nil.

7. **As the above examples reveal, the presumably neutral variables (percent of male freshmen and cost of room and board) were moderately associated with various aspects of quality, as defined in the study.** The cost of room and board, for example, contributed positively to the prediction of reputation in northern universities and colleges, percent of male freshmen contributed

positively to the prediction of reputation in national liberal arts colleges, and percent of male freshmen contributed negatively to the prediction of retention in midwestern regional schools.

Discussion. The strength of student ability as a predictor for reputation is not especially surprising, given previous research in this area (Astin & Solomon, 1981). What is surprising is that student ability is less related to outcomes such as retention and graduation than it is to reputation, and that all of the observed relationships were so much stronger in the national schools than in the regional institutions. Entrance test scores, which might be called the "leading indicator" for national universities and liberal arts colleges, were (comparatively) much less associated with reputation in the midwestern and northern regional schools, and only modestly associated with retention or graduation. The large amount of unexplained variance in regional schools' reputational scores, retention and graduation rates tells us that we cannot look to selectivity, faculty, resource, or outcome indicators alone to tell us which institutions are strong or weak in these dimensions.

Some explanations for the poorer predictive ability of the traditional indicators in regional settings can be explained--but only partially--by statistical artifacts, such as restriction of range in the variables or error variance in reputational scoring methods. The findings assert a more difficult problem with the definition of quality and the irrelevance of selectivity and resource indicators for institutions that are nonselective, public (resource-limited), and diverse in mission to begin with. The fact that it is easier to predict reputation than desired educational outcomes (i.e., retention and graduation) speaks to the hardiness of the traditional indicators in our way of thinking. (To wit, even though entrance test scores don't predict retention or graduation rates very well in midwestern regional schools, they do pretty well in predicting a midwestern regional school's reputation.) This fact also tells us something about the construct we're measuring: when we assess reputations we are judging schools on given inputs (e.g., student ability, resources, cost of room and board, percent male students) rather than on school's contribution to students' growth and development or on students' achievement of relevant objectives.

It is intriguing to speculate how the evaluation of quality might be different, and how the education of students might be better served, if some measure of an institution's commitment to evaluating its own processes were used as an indicator of quality. Institutional commitment to internal evaluation/research and faculty/administrator development are all commonly accepted hallmarks of excellence in the assessment movement, yet measures of such commitment have yet to be incorporated into theoretical models of quality or into specific indicators. Rather than allowing external factors which are beyond the control of many institutions to change (e.g., students' test scores, socioeconomic background), it seems both logical and responsible for higher education institutions to focus on what they (faculty and staff) actually do for students. Astin expresses this view succintly:

My view that institutions need to take a more student-oriented approach to administration and planning implies some methods of assessing quality which deviate considerably from the traditional approaches. Thus, under this new view, a "high-quality" institution is one that knows what's happening to its students and one that gives both faculty and administrators clear-cut opportunities to develop their academic skills under minimally threatening conditions . . . . The high-quality institution has a system of measurment and feedback on student development that enables it to make appropriate adjustments in programs or policies when the need for change or improvement is indicated. ***In other words, quality is equated here not with prestige or physical facilities but rather with a continuing process of critical self-examination that focuses on the institution's contribution to the student's intellectual and personal development*** (Astin, 1986, p. 56).

Conclusion. The study findings generally confirm the validity of common indicators for measuring reputation in undergraduate settings for two of the institutional categories studied (national universities and national liberal arts colleges). The results especially confirm the average entrance test score's ability to predict reputation and (to lesser extents) retention and graduation rates. Even in the national schools, however, the amount of unexplained variance in retention and graduation rates indicates that other factors are involved with successful college outcomes. Moreover, the study methodology (which is an analysis of associations) does not permit cause-and-effect conclusions: raising the entrance test score requirement will not automatically raise graduation rates.

The study also shows that the interaction between selected indicators and institutional type (i.e., geographic setting, student population, mission, etc.) affects the degree of validity obtained. Technically speaking, "validity" is not a fixed quantity of "goodness," intrinsic to a test, indicator, or variable, but a measure of the relationship between variables, and that relationship is both time-bound and situation-dependent. There are as many validity coefficients as there are institutions and student populations (although certain patterns do certainly exist). Instead of falling prey to the "ratings game," in which institutions are ranked on indicators that may or may not be relevant, researchers and policy makers can more profitably spend their time learning about the characteristics that lead, in their own settings, to greater retention, graduation, student satisfaction, learning in areas of concentration, and other "quality" outcomes that are determined locally and valued.

Table 1

Correlation of Indicators and Neutral Variables With Retention Rate, Graduation Rate, and Reputational Score for Four Categories of Higher Education Institutions

INDICATOR	CATEGORY OF INSTITUTION			
	National Universities & Colleges (N = 189)	National Liberal Arts Colleges (N = 135)	Midwestern Regional Liberal Arts (N = 130)	Northern Universities & Colleges (N = 141)
Retention				
Room & Board	.50			
Acceptance Rate	-.59	-.60		.48
Entrance Test Score	.63	.70		.55
Class Standing	.50	.63		
Percent Faculty PhD	.48			
Instructional Budget	.47			
Graduation Rate				
Acceptance Rate	-.47	-.63		
Entrance Test Score	.46	.63		
Class Standing	.48	.61		
Percent Faculty PhD	.41			
Instructional Budget	.44	.56		
Reputation				
Room & Board	.47	.44		
Acceptance Rate	-.63	-.70		
Entrance Test Score	.70	.84	.45	.62
Class Standing	.66	.74		
Percent Faculty PhD	.46	.43		
Instructional Budget	.62	.83		.41
Retention Rate	.62	.69	.46	
Graduation Rate	.41	.68		

Note: Only coefficients at .40 or greater are listed. No correlations of this magnitude were found for percent male or faculty/student ratio.

Table 2

Summary Tables of Stepwise Multiple Regression of Eight Indicators on Retention Rate for Four Categories of Higher Education Institutions

INSTITUTIONAL CATEGORY	Variable	R	R2	R2 Change	F Value
National Universities & Colleges	1. Entrance Test Score (+)	.63	.40	.40	126.02***
	2. Acceptance Rate (-)	.69	.48	.08	28.49***
	3. Percent Faculty PhD	.72	.51	.03	12.53**
	4. Room and Board (+)	.73	.53	.01	5.73*
National Liberal Arts Colleges	1. Entrance Test Score (+)	.70	.48	.48	124.24***
	2. Acceptance Rate (-)	.72	.52	.04	10.69**
Midwestern Regional Liberal Arts Colleges	1. Entrance Test Score (+)	.39	.15	.15	23.28***
	2. Percent Male (-)	.47	.23	.07	11.74**
Northern Universities & Colleges	1. Entrance Test Score (+)	.48	.23	.23	40.71***
	2. Class Standing (+)	.52	.27	.04	8.49**
	3. Room and Board (+)	.54	.29	.02	4.17*

* $p < .05$
** $p < .01$
*** $p < .001$

Table 3

Summary Tables of Stepwise Multiple Regression of Eight Indicators on Graduation Rate for Four Categories of Higher Education Institutions

INSTITUTIONAL CATEGORY	Variable	R	R2	R2 Change	F Value
National Universities & Colleges	1. Class Standing (+)	.48	.23	.23	54.76***
	2. Acceptance Rate (-)	.53	.28	.06	14.77***
	3. Percent Faculty PhD	.57	.32	.04	11.05**
National Liberal Arts Colleges	1. Entrance Test Score (+)	.63	.40	.40	88.01***
	2. Acceptance Rate (-)	.69	.48	.08	20.70***
	3. Faculty Student Ratio (-)	.71	.50	.02	5.89*
Midwestern Regional Liberal Arts College	1. Class Standing (+)	.29	.08	.08	11.77**
	2. Entrance Test Score (+)	.34	.12	.03	4.82*
Northern Universities & Colleges	1. Class Standing (+)	.36	.13	.13	21.02***
	2. Room and Board (+)	.47	.22	.09	15.92***

* $p < .05$
** $p < .01$
*** $p < .001$

Table 4

Summary Tables of Stepwise Multiple Regression of Ten Indicators on Reputational Score for Four Categories of Higher Education Institutions

INSTITUTIONAL CATEGORY	Variable	R	R2	R2 Change	F Value
National Universities & Colleges	1. Entrance Test Score (+)	.70	.49	.49	177.39***
	2. Class Standing (+)	.75	.57	.08	34.65***
	3. Instructional Budget (+)	.78	.61	.04	18.35***
	4. Retention Rate (+)	.80	.64	.03	15.41***
	5. Acceptance Rate (-)	.80	.64	.01	4.10*
National Liberal Arts Colleges	1. Entrance Test Score (+)	.84	.70	.70	312.83***
	2. Instructional Budget (+)	.90	.81	.11	80.36***
	3. Graduation Rate (+)	.91	.83	.02	12.31**
	4. Acceptance Rate (-)	.92	.84	.01	6.38*
	5. Percent Male Students (+)	.92	.84	.01	4.98*
Midwestern Regional Liberal Arts Colleges	1. Retention Rate (+)	.46	.21	.21	33.90***
	2. Entrance Test Score (+)	.55	.30	.09	15.86***
	3. Percent Faculty PhD (+)	.59	.35	.05	10.22**
	4. Instructional Budget (+)	.62	.38	.03	6.11*
Northern Universities & Colleges	1. Entrance Test Score (+)	.62	.38	.38	86.29***
	2. Instructional Budget (+)	.65	.43	.04	10.27**
	3. Percent Faculty PhD (+)	.67	.45	.03	6.75*
	4. Room and Board (+)	.69	.47	.02	5.63*

* $p < .05$
** $p < .01$
*** $p < .001$

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Research Notes

Office of Research and Evaluation

September 25, 1991

The Effect of Ethnic Background on General College Students' Views of the Campus Climate

Last spring, the Office of Research & Evaluation and Student Services joined together to survey first-year college students on their views of the campus climate. The mailed questionnaire, which was six pages long and contained about 20 multiple-part questions, actually covered a number of areas, including student's reported: 1) reasons for coming to college, 2) readiness to engage in the academic and social demands of college, 3) use of University and College resources and participation in extra-curricular activities, 4) experiences with potential sources of discrimination, and 5) feelings about proposed support strategies for students of color. Just over 40% of the stratefied sample responded to the survey. While this rate is less than desirable, a follow-up of the respondents and nonrespondents helped us clarify to whom the results can be generalized.

A full report of this study was released in mid-September to GC Deans, Division Heads, Committee Chairs, all members of the GC Multicultural Committee, the Director of OMSSA, the Directors of the University Learning Resource Centers, and the Director of the Commission on Women. The report issues findings for three ethnic groupings: 1) Asian/Pacific Island students, 2) Caucasian students, and 3) a Composite group of American Indian students, African American students, and Chicano/Latino/Hispanic students. (These latter groups were consolidated due to small populations and limited response rates.)

The study is relevant for faculty and staff interested in developing curricular and advising support strategies for diverse student populations. As we strive to make this a positive environment for all students and to develop a philosophy of multiculturalism both in the classroom and in Student Services, we need to listen to students and hear their perceptions of the climate and their preferences for types of support. In challenging some of our assumptions about "what students of color want," the study also adds to a growing body of knowledge about ethnic differences and variations within ethnic populations. This winter, additional follow-up of students will be done in order to investigate possible associations between survey responses and academic achievement and retention. Because the report is lengthy, only some of the primary findings are highlighted in this edition of "Research Notes." To request a copy of the full report, contact Connie Schmitz (133 Appleby Hall; telephone 5-2076).

Focus of the Study. Broadly speaking, this study addressed the question: "Does amount of perceived support, self-reported academic and social preparation, involvement, experiences, and preference for support strategies vary systematically by ethnic group?" The answer turned out to be a combination of both "Yes" and "No." Ethnic groups varied in their perceptions of their own *academic*, but not in their *social* preparation for college. Both the amount of encouragement to attend college they reported receiving, and the amount of on-campus experiences involving potential discrimination, varied less between the ethnic groups than we expected. (The amount of negative experiences was also generally low, although there were some notable exceptions.) American Indian, African American, and Hispanic and Latino and Chicano students appeared to be more active overall in using campus resources and participating in extracurricular activities than other students; by comparison, Asian students were much less aware and less active. And finally, wide variation in preferred support strategies was found both within ethnic groups as well as between ethnic groups.

The findings led to the following summary thoughts and recommendations:

1. **Students of color vary among themselves in terms of their preferences for support strategies that have traditionally been targeted for them.** Nearly all the support strategies listed were important to at least some students of color. Some of the strategies were also attractive to Caucasian students. This means that Student Services programming needs to anticipate the range of preferences indicated; however, individual students should not be assumed to desire (or not desire) certain support strategies on the basis of their ethnic background.

2. **More important than the amount of encouragement and support a student receives to attend college are his or her reasons for attending.** Only 14% of all respondents articulated a long-term reason for attending General College, such as "To transfer," "To get a degree to help my people." About one-third of American Indian, African American, and Hispanic and Latino and Chicano students listed no reason for attending, and almost 42% of the Caucasian students listed a short-term negative reason such as, "I didn't choose GC, I was placed here." At the same time, students of color (except Asian students) reported receiving greater encouragement to attend college from University staff or recruiting personnel than Caucasian students. While encouragement is important, it seems important that students who are being recruited for college (or being "placed" in GC) need to hear not only about the benefits of a four-year degree, but the nature of a liberal arts background, the expectations and demands on college students, the characteristics that put GC students at risk, and the importance of their ownership in the decision to attend college.

3. **Of all three ethnic groupings, Asian respondents were the least involved with campus resources and activities, the most desiring of a "sense of community," and the least satisfied with their overall college experience.** They also reported the highest average number of study hours per week and the greatest frustration with transportation problems. It would be helpful if faculty and staff could discuss these findings and try to understand this pattern of responses. On the face of it, it appears that Asian students may benefit from additional assistance from advisors and faculty in connecting to campus resources, activities, and student life in general.

4. **Active teaching techniques that use a variety of modes of delivery (e.g, visual materials) are usually appreciated by all students, regardless of ethnic background.** Good teaching is good teaching, and using a variety of visual and audio modes of delivery has long been accepted as beneficial for broadening as well as accommodating different learning styles. In this study, a large proportion of each ethnic group felt that they learned best from visual materials. The highest proportion, however, was in the Asian group. This finding may be explained in that at least some of the Asian students were probably non-native speakers, and visual materials may be especially critical for clarifing or reinforcing spoken information for them.

5. **Using multicultural materials in the classroom will probably have more immediate appeal and "do more" (in the sense of motivation) for students of color than for Caucasian students.** Students of color and Asian students were significantly more likely than Caucasian students to agree with a statement about the positive effect of using multicultural materials in the classroom. While this finding should not discourage faculty from using multicultural materials or addressing issues of cultural diversity, the difference between Caucasians and students of color on this item is worth noting. It reminds us of findings from the Evaluation of the 1990 GC Orientation (Schmitz, 1991) in which proportionally fewer Caucasian than African American or Asian students found the multicultural sessions "relevant" or "helpful." Perhaps we need to search for new ways to make Caucasian students feel that multicultural issues pertain to them--that these issues are not just for students of color. Faculty may also need to recognize that dealing with issues of racism may be more difficult for some students than others. (In this study, Asian students expressed greatest discomfort). Some provisions for processing the "aftermath" of difficult classroom discussion might be beneficial to the students involved.

6. **Explore women's issues with women of color.** American Indian, African American, Chicano/Latino/Hispanic, and Asian students were more likely than Caucasian students to feel that GC needs to address issues of gender discrimination. Asian students were also less likely to *disagree,* than other students, with a statement about having observed or experienced "a fair

amount of unequal treatment or harrassment of women students, simply because they are women." This finding needs further exploration and has implications for teaching, additional research, and advising.

7. **Offer a course on human relations.** Over half the students in each ethnic grouping said they would want to take a course in human relations that was designed to "educate us on each other's backgrounds and how to respect our differences." More students of color were in favor of this strategy than they were of regular student forums, using multicultural or audio-visual materials, holding separate orientation sessions, having advisors of the same ethnic background, or any of the other 12 ethnically-related support strategies listed. More Caucasians and Asians were also in favor of this strategy over any other, except for having more visual materials in the classroom.

Certainly, further questions regarding ethnic differences and the campus climate can be pursued by faculty in the classroom, advisors in counseling, as well as by other University of Minnesota researchers. We welcome dialogue and comments from others regarding this report. This is an important topic, one that can be greatly enriched by involvement from all members of the General College, University of Minnesota, and higher education communities.