



# Beyond First Year Retention: Bridging the Student Success and Campus Strategic Retention Initiatives

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## Abstract

The College Student Inventory (CSI) has been used at the University of North Dakota since 2002 to identify student pre-college characteristics and behaviors that may interfere with student success. Many researchers have narrowly focused upon the retention of new students, but have overlooked the true reflection of success. Office of Institutional Research has found that student success involves a significant number of faculty, staff, and students from across the university community. As a result, student strengths and areas of improvement were identified, academic advising in study planning and personnel management became more effective, and current and longitudinal trends to particular cohorts have shown improvement. CSI has been shown to be a reliable longitudinal research and measurement tool to gather individual information that reflects each freshman's orientation to college, motivation, receptivity to assistance, and subsequent retention (Strait, 2001). The presentation includes the use of prediction modeling to measure the effects of freshmen academic attrition and academic success.

## Conceptual Framework

Tinto (1993) emphasized that the key to retention lies not only with specific retention strategies but also with the development of a commitment to the educational process as a whole. The College Student Inventory (CSI) of the Noel-Levitz Retention Management System is a nationally distributed self-reported survey instrument. The University of North Dakota has selected the CSI-Form B as a reliable longitudinal research and measurement tool to gather information that reflects each student's orientation to college, motivation, and receptivity to assistance. CSI was administered to first-time full-time freshmen at this university in 2002, 2003, 2004, and 2005 during summer orientation. The instrument contains 100 Likert-type items. Each item uses scale of 1 to 7 with 1 equaling "Not at all true" and with 7 meaning "Completely true". Student responses to these items are summarized by 16 different scales.

Three CSI reports are prepared by Noel-Levitz. The first report is for each individual student, second for each student's academic advisor, and the third is an overall institutional report. Noel-Levitz also constructs a Dropout Proneness scale which is designed to measure a student's overall inclination to drop out of college before completing a degree. Since 2002, academic advisors have provided CSI students advising, necessary referrals, and sometimes follow-up sessions in one-on-one and focus group formats.

The percentage of freshmen identified with high dropout proneness has been increasing every year - 17% in 2002, 20% in 2003, and 25% in 2004. However, the percentage of 2005 freshmen identified with high dropout proneness dropped to 19% in fall 2005 when new freshmen were admitted using raised admission standards.

## Method

- The design and development of the retention study, research method, subsequent data collection and analysis, result reporting and data storage were approved by the UND Institutional Research Board.
- The Office of Institutional Research received all of the CSI reports. CSI survey data was then matched with student record data to assess the usefulness of the high dropout indicator as a preventive tool to enhance enrollment status and academic success in freshmen attending this university. This study compares the mean Grade Point Averages (GPA) for each academic semester and cumulative GPA's earned at UND of CSI students and by college where the CSI students enrolled. Among the 1,719 students who participated in the 2002 CSI, 1,674 registered for the Fall semester of 2002. They were 280 out of 290 classified in the Dropout Prone Group (DP Group) and 1,394 out of 1,429 classified in the Lower-Risk Group (LR Group).
- Descriptive statistics were calculated for all variables to aid in characterizing the sample. Factor Analysis and Multiple Regression were also used in the study. Principal component factor extraction with Varimax rotations was used to simplify the resulting factor structures along with maximizing the loadings. The process yielded 16 orthogonal factors with eigenvalues greater than one and Cronbach's alpha was also calculated. The data analysis conducted for the five research questions involved an analysis cycle to determine which, if any, of the 16 scales of the CSI distinguish enrollment status and academic success in freshmen attending this university in fall 2002. These 16 factors accounted for 62.5% of the variance.
- The data analysis for all research questions included multivariate analysis, analysis of variance (ANOVA), and t-testing. If significant differences in any of the 16 scales existed as a result of the multivariate analysis, ANOVA was then performed to test for significant differences in the mean responses of each item that comprise the scale. The remaining test in the analysis involved a t-test to indicate which group responded lower or higher than the other to the particular item or factor. Other predictors of college success such as self-reported parent's education when comparing students' first-semester GPA, First-generation college students are students whose parents had not earned a bachelor's degree.
- In this study, some of the results of the statistical analysis and statistical significance from the contributing variables, singly or in combination, were observed and reported. The findings of the study, however, were limited to information included in the enrollment data and student response to the CSI.

## Sixteen CSI Scales and Dropout Proneness

The CSI takes student input and produces 16 scale scores. Five of these scales are combined to produce a Dropout Proneness Score. Students are included on a list of "Student with High Dropout Proneness" if their percentile scores on dropout prone are 65 or higher. Among 1,674 freshmen who took CSI in summer 2002 and also enrolled in Fall 2002, 280 (16.7%) were identified as High Dropout Proneness.

The Dropout Proneness Score range from one to nine and is expressed on a **staircase scale** with 1 being very low, 5 being average, and 9 being very high. A Dropout Proneness Score of 1 indicates that the prediction of student dropout proneness is very low while a score of 9 indicates a very high dropout potential. Among 1,674 freshmen, 322 (19.2%) received a Dropout Proneness staircase scores 6 through 9 which were at-risk and needed a mentoring intervention.

## Research Questions

- Is there a significant difference between male and female students on all 16 CSI scales?
- Is there a significant difference in students who were identified as Dropout Prone and those who were in the Lower Risk Group on all 16 CSI scales?
- Is there a significant difference between academically successful students and academically unsuccessful students on all 16 CSI scales?
- Is there a significant difference between first-generation and not first-generation students on all 16 CSI scales?
- Is there a relationship between student performance and student retention?

## Factors and Reliability (Cronbach's Alpha=0.806)

Career closure <sup>2</sup> (4 items)	0.895
Intellectual interests <sup>1</sup> (4 items)	0.870
Math/Science confidence <sup>3</sup> (6 items)	0.859
Attitude toward educators <sup>4</sup> (6 items)	0.856
Desire to finish college <sup>1</sup> (8 items)	0.851
Study habits <sup>1</sup> (6 items)	0.841
Verbal Confidence <sup>3</sup> (6 items)	0.830
Sense of financial security <sup>2</sup> (4 items)	0.830
Family emotional support <sup>2</sup> (4 items)	0.822
Opinion tolerance <sup>2</sup> (6 items)	0.811
Personal counseling <sup>3</sup> (6 items)	0.771
Career counseling <sup>2</sup> (5 items)	0.770
Sociality <sup>2</sup> (4 items)	0.762
Academic assistance <sup>2</sup> (6 items)	0.755
Social enrichment <sup>2</sup> (4 items)	0.700
Financial guidance <sup>2</sup> (4 items)	0.544

<sup>1</sup>Academic Motivation (6 factors) <sup>2</sup>General Coping Ability (5 factors) <sup>3</sup>Receptivity to Support Services (5 factors)

## Success on F2002 and First-year Retention

(Based on F2002 Term GPA: 87% were 2.00 or higher and 13% were below 2.00)

** Correlation is significant at the .01 level (2-tailed)	Pearson Correlation	.272**
	Sig. (2-tailed)	.000
	N	1656

There is a positive relationship between student first-semester performance and student first-year retention

## Success on S2003 and First-year Retention

(based on S2003 Cum GPA: 91% were 2.00 or higher and 9% were below 2.00)

** Correlation is significant at the .01 level (2-tailed)	Pearson Correlation	.298**
	Sig. (2-tailed)	.000
	N	1570

There is a positive relationship between student second-semester performance and student first-year retention

2002 CSI Cohort, Subgroups & Retention	All		Gender		Dropout Prone (Percentile Score > 65)		First-Generation		Academic Success (Term GPA > 2.00)	
	M	F	Yes	No	Yes	No	Yes	No	Yes	No
F 2002	1,674	843	831	280	1,394	649	1,025	1,460	214	
S 2003	1,567	786	781	241	1,326	605	962	1,346	221	
F 2003 (1 <sup>st</sup> yr retn)	1,311 (78%)	651 (77%)	660 (79%)	184 (66%)	1,127 (81%)	502 (77%)	809 (79%)	1,134	177	
S 2004	1,244	620	624	168	1,076	472	772	1,097	147	
F 2004 (2 <sup>nd</sup> yr retn)	1,121 (67%)	562 (67%)	559 (67%)	144 (51%)	977 (70%)	417 (64%)	704 (69%)	1,010	111	
S 2005	1,077	539	538	135	942	394	483	959	118	
Graduated (3 <sup>rd</sup> yr retn)	15	6	9	1	14	9	6	15	0	
F 2005 (3 <sup>rd</sup> yr retn)	1,004 (61%)	505 (60%)	499 (61%)	119 (43%)	885 (64%)	354 (55%)	450 (64%)	925	79	
Graduated	27	12	15	0	27	7	20	27	0	
S 2006	957	484	473	14	843	340	617	NA	NA	

Subgroups (Sig. **p<.05, ***p<.001)	Male vs. Female	Dropout Prone vs. Lower Risk	First-Generation vs. Other	Success (≥2.00) vs. Not success (<2.00) (S2003 CumGPA)
AM-Intellectual interests	***			
AM-Math/science confidence		**		
AM-Attitude toward educators	***	***		
AM-Desire to finish college	***	***	**	
AM-Study habits	***	***		*
AM-Verbal confidence	***			*
GC-Career closure	***	***	*	***
GC-Sense of financial security	***	***		*
GC-Family emotional support	***	***	***	
GC-Opinion tolerance	***			**
GC-Sociability		**		
R-Personal counseling	*			
R-Career counseling	***	***		
R-Academic assistance	***	***		
R-Social enhancement	**	***		
R-Financial guidance	***	***		

AM = Academic Motivation GC = General Coping R = Receptivity

## List of UND Students Who Were Classified into the Following Categories

Classification	Explanation	N	%
Students with high dropout proneness	The percentile scores on dropout proneness are 65 or higher	288	17%
Students who are highly receptive to institutional help	The percentile scores on general receptivity to institutional help are 65 or higher	518	30%
Students needing academic assistance	with a focus on their desire for specific academic services	318	18%
Students who might benefit from personal counseling	with a focus on their specific needs	318	18%
Students who might benefit from career counseling-with a focus on their desire for specific counseling services	The percentile scores on educational stress are 65 or higher or percentile scores on dropout proneness are 80 or higher	469	27%
Students who need social enhancement	The percentile scores on educational stress are 65 or higher or percentile scores on dropout proneness are 80 or higher	469	27%
Students with low sense of financial security	The percentile scores on career closure are 35 or less	521	30%
Students with low scores on internal validity	The percentile scores on sociability are 35 or less	517	30%
Students with low scores on internal validity	The percentile scores on sense of financial security are 35 or less	458	27%
Students with low scores on internal validity	Raw scores on internal validity are 5 or less out of a possible 7	4	0.2%

## Results

- This study compares the mean Grade Point Averages (GPA) by each academic semester and cumulative GPA's earned at UND of CSI students and by college where the CSI students enrolled.
- After one-year of studying at this university, the Dropout Prone (DP) Group retained 241 students with an average cumulative GPA of 2.39 while the Lower-Risk (LR) Group retained 1,326 students with an average cumulative GPA of 3.08.
- Furthermore, differences in the first-year cumulative GPA between CSI students enrolled at 7 different academic colleges also exist. CSI students enrolled in the College of Nursing achieved a GPA of 3.17, followed by the School of Engineering and Mines (3.11), School of Aerospace Sciences (3.03), College of Arts and Sciences (2.98), School of Medicine and Health Sciences (2.97), College of Business and Public Administration (2.94), College of Education (2.91), and major undecided (2.56).
- Several methods were utilized to determine if CSI is a reliable measure of students' ability to succeed and persist in college. Principal component factor extraction with Varimax rotations was used to simplify the resulting factor structures along with maximizing the loadings. The process yielded 16 orthogonal factors and Cronbach's alpha was also calculated. Reliability estimates averaged 0.806 via coefficient alpha. Factor analysis confirmed that the 89 items loaded on 16 factors, which basically corresponded to their designations.
- A relatively higher retention rate was consistently observed in the LR Group than its counterpart, the DP Group, throughout all points in time since 2002. The retention rates of the CSI students after completion of one year are 81% for the LR Group compared to 66% for the DP Group. After completion of two years, the retention rates are reduced to 70% for the LR Group compared to 51% for the DP Group. After completion of three years, the retention rates are further reduced to 64% for the LR Group compared to 43% for the DP Group.

## Summary

- According to the planning report, it appears that our fall 2002 incoming freshman class (875 male and 849 female) near the national norm on 13 of the 16 scales (not including the Internal Validity) measured by the CSI. Overall, UND entering freshmen are below the national norm for dropout proneness, predicted academic difficulty, educational stress, and receptivity to institutional help. This suggests that our freshmen are less likely to drop out, have academic difficulty or have higher levels of educational stress than average college students are, but are also less likely to be receptive to receiving institutional help. However, below average mean scores have been found in the areas of academic assistance, personal counseling, and career counseling within UND's entering freshmen.
- On several of the CSI scales, there appear to be significant differences across gender lines. UND male students fell below national averages on study habits, intellectual interests, desire to finish college, receptivity to academic assistance and career counseling. UND entering freshmen males are also more likely to drop out or experience academic difficulty than their female counterparts.
- Noel-Levitz provided UND a planning report which includes lists of students who fall into the following categories: 1) students with high dropout proneness, 2) who are highly receptive to institutional help, 3) those needing academic assistance, 4) who might benefit from personal counseling, 5) who might benefit from career counseling, 6) who need social enhancement, and 7) who are highly receptive to institutional help.

## Limitations of the Study

- In an opinion survey such as this, only those most interested in the topic are likely to respond and some may be too dependent about the topic or insecure in their employment position to respond.
- Problems with delivery of the survey may have hampered some from being able to respond.
- While the findings may indicate correlation between changes on learning styles and retention, the correlation of learning, they can not determine causation.

## Next Step

- Compare CSI questions with college GPA
- Examine the predictors' implementation focus groups and qualitative study
- Follow-up and calculate graduation rate
- Intervention can be extended to all freshmen who may drop out during their first year at college with or without displaying visible warning signs.
- The Office of Institutional Research has routinely presented tracking information and findings on relevant retention benefits in identifying the high risk students to the associate vice presidents for enrollment management and college representatives.
- The academic advisors are more motivated in providing essential early preventive assistance.
- This presentation will demonstrate how institutional researchers can become significant contributors to the accountability of retention management, strategic planning, assessment, or accreditation process at their institutions.