

Hope College Four-Year Retention Study

November 2011

The population for this study is the incoming first-year first-time in college students over the five year period of 2003 to 2007. The measure of retention, chosen after an evaluation of several alternatives, is four-year retention. A student is considered retained for four years if she has either graduated or is still enrolled at Hope four years after her entrance. The population for this study is 3,997.

The study included as independent variables only variables that are determined at time of student entrance to Hope College. These come from admissions data and financial aid data. These variables are listed in Appendix A with a corresponding retention rate and the level of significance of that variable, if any.

Results

Seventeen variables had a significant relationship with the four-year retention rate. These variables are listed below by category.

Academic achievement – Four variables measuring academic achievement were found to be significantly related to retention rate at the 0.001 level. These are 1) high school GPA, 2) high school rank, 3) ACT score or equivalent for those taking only SAT, and 4) meeting the qualifications for a Hope College merit award.

Financial – Five financial variables had a significant relationship with the four-year retention rate. Two were positively related, meaning the higher the variable the higher the retention rate. These are Expected Family Contribution (0.05 level) and amount of Hope Merit Scholarship (0.001 level). The three variables that have a significant negative relationship with four-year retention are demonstrated need (0.01 level), amount of loan (0.001 level), and unmet need (0.001 level).

Engagement – Two variables related to engagement have a significant positive relationship to four-year retention, namely count of number of admissions contacts (0.001 level) and reported number of high school activities (0.001 level).

Connection to college – The variable called Preferred Legacy flags those students who have a parent or sibling who attended Hope. That variable has a significant positive relationship to four-year retention at the 0.001 level.

Gender – Male students have a significantly negative relationship to four-year retention with females having the corresponding positive relationship (0.001 level).

Geography – Overall, the geographical location of a student's home shows a significant relationship to retention (0.001 level). Students from Illinois and those from eastern states (excluding New York and New Jersey) have a higher retention rate at the 0.01 level. Students from Michigan have a lower retention rate significant at the 0.001 level.

Religion – Overall, religion was related to 4-year retention at the 0.01 level. Students who self-report as Reformed Church in America have a significantly higher retention rate (0.05 level).

It is also important to note variables that were not significantly related to retention. These include ethnicity, field of academic interest, and distance of campus from hometown. It was also discovered,

though not shown in Appendix A, that the cohort group also had no significant relationship, i.e., there was no significant variation among the five entering classes.

Logistic Regression

A Logistic Regression model was constructed with four-year retention as the dependent variable. This model provides a method of calculating a predicted probability that a student remains at Hope for four years from a set of independent variables that are available. The model determines independent variables that contribute to this calculation one at a time, with the highest contributing variable that is not yet included entering the model at each step. The model that was constructed stopped after eight variables were included as none of the non-included variables added a significant contribution.

These variables do not necessarily include all of the variables that have a significant relationship since some variables' relationships to retention are overlapping. For example, high school GPA was the first variable introduced in the model, but its inclusion eliminated the other three academic achievement variables with significant relationships (high school rank, Hope merit award, ACT score) because once high school GPA was introduced the other three made very little additional contribution.

Also, some variables that did not show a significant relationship were included in the model because they became significant after accounting for variables introduced before them. The final two variables in the logistic regression model, Midwest state and average income in student's zip code, are examples of this.

Future Work

While this study gives many interesting results, its primary purpose is to provide the basis for future work. The logistic regression model permits the calculation of a probability of retention for each student. The follow-up study will use these probabilities to measure the effect of various treatments that the students receive after arriving at Hope. This is best illustrated with two examples.

The first example is Focus students, which was studied by comparing the actual retention rate for all Focus students in the study and comparing it with the predicted retention rate. In this case, the predicted retention rate for the 77 Focus students was 67.8% and the actual retention rate was 59.7%. Though these students were retained at a rate lower than the model predicted, this difference was not statistically significant.

The second example is Phelps Scholars with a sample size of 242. Their predicted retention rate is 80.8%, approximately the same as the overall retention rate of 81.0%. The actual retention rate was higher, 81.8%. Again, this difference is not statistically significant.

Future studies can evaluate other student treatments and determine which ones significantly change students' retention rate from what would be predicted by the model. Examples might be participation in athletics or membership in Greek organizations.

**Appendix A
Hope College 4-Year Retention Study
Entering Students 2003-2007**

Factor	Ret %	Significance	Variable	Mean not ret	Mean ret	Significance
Merit yes/no	83.6%	+++	HSGPA	3.54	3.69	+++
State - MI	79.0%	- - -	Rank	62.59	68.31	+++
State - IL	85.7%	++	Contact Count	5.75	6.54	+++
State - NYNJ	87.2%	None	HS Activities	2.12	2.32	+++
State - MW	79.4%	None	Distance	397	476	None
State - East	88.5%	++	Income by Zip	52,500	52,212	None
State - West	84.3%	None	ACT Equiv	24.46	25.83	+++
State - None	80.0%	None	EFC	20,781	23,142	+
Home School	85.7%	None	Need	13,064	11,660	- -
Male	78.2%	- - -	Hope Merit	5,925	7,080	+++
White	81.3%	None	Other Hope	6,751	6,449	None
Hispanic	79.2%	None	Non Hope	3,504	3,377	None
African American	75.3%	None	Loan	3,921	3,581	- - -
Asian American	81.3%	None	FWS	1,439	1,419	None
Ethnicity Not Spec	79.5%	None	Unmet Need	4,969	3,802	- - -
Multi-Racial	84.2%	None				
Preferred Legacy	86.7%	+++				

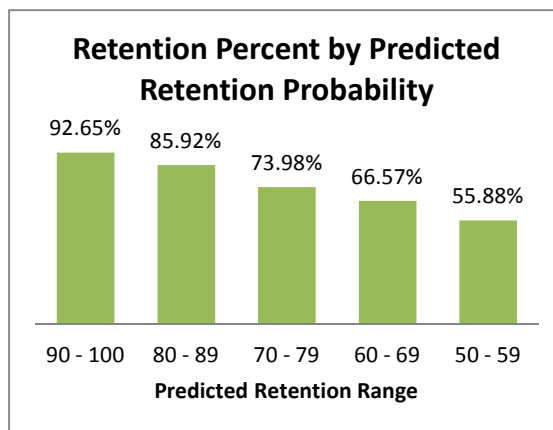
Regression Variables

			Variable	Ave Change in prob	
Other Legacy	77.0%	None	1 HSGPA	9.9%	per 1.0
Interests None	80.2%	None	2 Contact Count	1.4%	per contact
Interests NS	81.2%	None	3 Loan	-1.2%	per \$1K
Interests SS	81.5%	None	4 Preferred Legacy	6.3%	
Interests Hum	79.9%	None	5 State MI	-8.7%	
Interests Arts	82.2%	None	Hope Merit		
Interests Pre	82.3%	None	6 Amount	0.5%	per \$1K
Rel Catholic	81.8%	None	7 State MW	-10.2%	
Rel RCA	83.7%	+	8 Income by Zip	-0.8%	per \$10K
Rel Other					
Christian	81.9%	None			
Rel Other	82.4%	None			

Overall (N=3,997) 81.0%

Distribution of Retentions by Predicted Probability

Probability Range	4 Yr Ret.	Total	Ret Rate
90 - 100	504	544	92.65%
80 - 89	1647	1917	85.92%
70 - 79	779	1053	73.98%
60 - 69	231	347	66.57%
50 - 59	57	102	55.88%



+ - Significant at 0.05 level
 ++ - - Significant at 0.01 level
 +++ - - - Significant at 0.001 level

**Hope College Four-Year Retention Rate
Entering Students 2003-2007**

High Schools with 10 or more students

School	4 Yr Ret	Students	Ret Rate	Sign	School	4 Yr Ret	Students	Ret Rate	Sign
Forest Hills Eastern HS	11	11	100.0%		Lyons Township High School	14	17	82.4%	
Carman-Ainsworth High School	11	11	100.0%		Okemos High School	14	17	82.4%	
Lenawee Christian School	10	10	100.0%		Grand Haven High School	32	39	82.1%	
Saint Francis High School	16	17	94.1%		Unity Christian High School	27	33	81.8%	
Rochester High School	14	15	93.3%		Black River Public School	9	11	81.8%	
Hinsdale Central High School	13	14	92.9%		Marshall High School	9	11	81.8%	
Forest Hills Central HS	37	40	92.5%	+	North Muskegon Public HS	9	11	81.8%	
Seaholm High School	11	12	91.7%		South Christian High School	22	27	81.5%	
Forest Hills Northern HS	41	45	91.1%	+	Wheaton Academy	17	21	81.0%	
Timothy Christian High School	20	22	90.9%		Grandville High School	59	74	79.7%	
Prospect High School	10	11	90.9%		Hudsonville High School	39	49	79.6%	
Ludington High School	10	11	90.9%		Portage Central High School	19	24	79.2%	
Maine Township Hs South	9	10	90.0%		Traverse City West Sr. H.S.	19	24	79.2%	
Pioneer High School	9	10	90.0%		Wheaton-Warrenville South HS	11	14	78.6%	
Clarkston Senior High School	9	10	90.0%		Plainwell High School	11	14	78.6%	
Southfield Christian HS	9	10	90.0%		Traverse City Central HS	14	18	77.8%	
Naperville North High School	17	19	89.5%		Cadillac Senior High School	10	13	76.9%	
Mattawan High School	17	19	89.5%		Powers Catholic High School	10	13	76.9%	
Naperville Central High School	25	28	89.3%		Fremont High School	10	13	76.9%	
Kalamazoo Christian HS	32	36	88.9%		Zeeland West High School	10	13	76.9%	
Holland High School	93	105	88.6%	++	Saint Joseph High School	19	25	76.0%	
Zeeland East High School	68	77	88.3%	+	Hamilton High School	28	37	75.7%	
Lakeshore High School	15	17	88.2%		Saline H.S.	24	32	75.0%	
Wheaton North High School	22	25	88.0%		East Grand Rapids High School	18	24	75.0%	
Glenbard West High School	14	16	87.5%		Petoskey High School	15	20	75.0%	
Jenison High School	33	38	86.8%		Brighton High School	9	12	75.0%	
Northville High School	12	14	85.7%		Haslett High School	9	12	75.0%	
West Ottawa High School	79	93	84.9%		Rockford Senior High School	16	22	72.7%	
Herbert Henry Dow High School	28	33	84.8%		Calvin Christian High School	18	25	72.0%	
Holland Christian High School	83	98	84.7%		Illiana Christian High School	10	14	71.4%	
Mason High School	11	13	84.6%		Barrington Community HS	7	10	70.0%	
Rift Valley Academy	11	13	84.6%		East Kentwood High School	16	23	69.6%	
Midland High School	25	30	83.3%		Davison High School	9	13	69.2%	
Mona Shores High School	15	18	83.3%		Eaton Rapids High School	9	13	69.2%	
Portage Northern High School	15	18	83.3%		Chelsea High School	8	15	53.3%	---
Spring Lake High School	15	18	83.3%		Big Rapids High School	5	11	45.5%	---
Grand Rapids Christian HS	42	51	82.4%						

Significance

+ - 0.10 level

++ - - 0.05 level

+++ - - - 0.01 level

Overall Retention Rate = 81.0%