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Second-Year Retention Behavior of First-time Full-Time Freshmen at Virginia Commonwealth University

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Overview

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- ❖ Conceptual Framework
- ❖ Methods
- ❖ Analysis & Findings
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Introduction

❖ Virginia Commonwealth University

- Virginia Commonwealth University is a major public research university located in Richmond, the state capital of Virginia.
- VCU has experienced rapid growth in the previous decade, with total enrollment increasing from 23,000 students to 32,000 students between 1998 and 2008, and first-time freshman cohorts increasing from 2,200 students to 3,700 students.
- Today, VCU offers 222 degree and certificate programs, 67 of which are unique in the state of Virginia.
- VCU encompasses one of the largest academic health centers in the nation, the VCU Medical Center, named the No. 1 hospital in the state in 2013 by U.S. News & World Report.



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VCU Student Demographics, Fall 2013

	Non-degree		Non-degree		First	Total	Percent
	Undergrad	Undergrad	Graduate	Graduate	Professional		
Gender							
Male	9,466	725	1,862	320	760	13,133	42.0%
Female	12,529	631	3,088	612	932	17,792	56.9%
Not Reported	85	221	18	23	16	363	1.2%
Race/Ethnicity							
American Indian	57	2	18	3	2	82	0.3%
Asian	2,659	79	250	60	447	3,495	11.2%
Black	4,020	148	519	137	96	4,920	15.7%
Hawaiian/Pacific	63	1	6	1	0	71	0.2%
Hispanic/Latino	1,657	39	172	34	42	1,944	6.2%
International	644	305	506	39	29	1,523	4.9%
Two/More Races	1,016	23	83	11	18	1,151	3.7%
White	11,244	589	3,265	590	827	16,515	52.8%
Unknown	720	391	149	80	247	1,587	5.1%
URM	6,813	213	798	186	158	8,168	26.1%
Full-time vs. Part-time							
Full-time	19,625	364	3,224	133	1,707	25,053	80.1%
Part-time	2,455	1,213	1,744	822	1	6,235	19.9%
Residency							
In-state	19,837	1,195	3,544	787	1,175	26,538	84.8%
Out-of-state	2,243	382	1,424	168	533	4,750	15.2%
UNIVERSITY TOTAL	22,080	1,577	4,968	955	1,708	31,288	



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❖ Past Focus – First-Year Retention

- In 2005, the provost appointed a team to develop new methods for improving the undergraduate experience at VCU, with a specific focus on first-year students. These plans laid the foundation for the University College, which opened in Fall 2006 as the central location for a variety of programs and resources (academic advising, tutoring, writing assistance, etc.) to achieve this end.
- Between 2005 and 2013, first-year retention rose from 82% to 87%.



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Introduction

❖ Second-Year Retention

What do we know?

- Between 2005 and 2012, second-year retention rose from 69% to 75%.

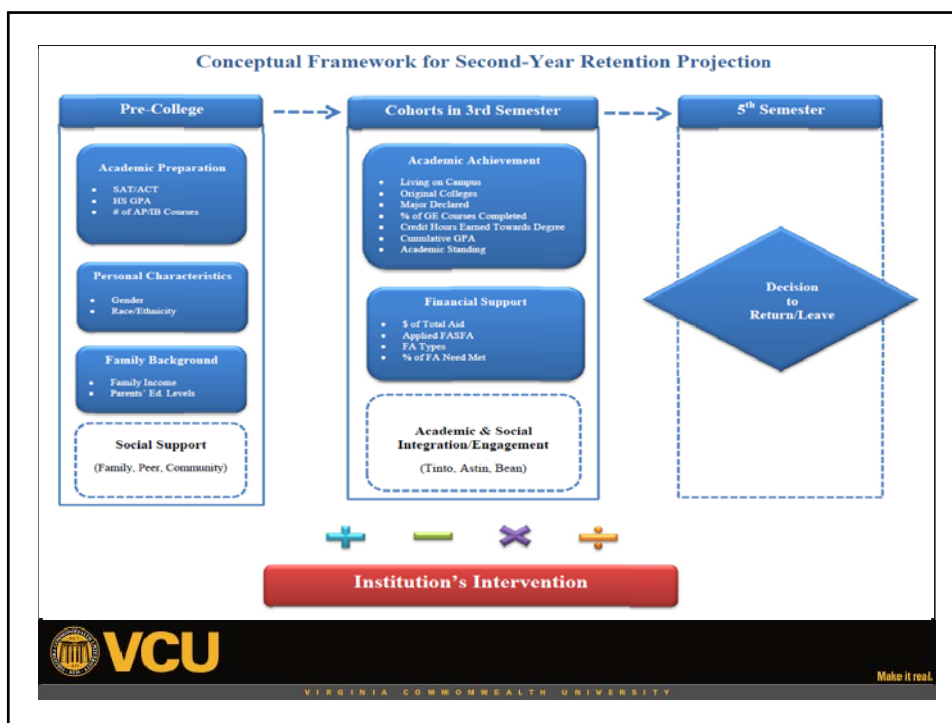
Research Questions:

- What factors are most important in determining whether a first-time student is retained after their second year?
- Are these factors different for students who are receiving financial aid?
- Where do these not-retained students go?



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Methods

- ❖ **Univariate tests (t-test, chi-squared):** how is a single variable correlated with retention?
- ❖ **Multivariate analysis (logistic regression):** how do multiple variables interplay and how are they associated with retention?
- ❖ **Tracking students who left VCU (National Student Clearinghouse):** where did the students go when they left VCU?

Methods (Cont.)

❖ Pre-College – Personal Characteristics

- Gender: Male / Female
- Race/Ethnicity: White / Asian / Black / Hispanic / Other

❖ Pre-College – Family Background

- Dependency Status: Dependent / Independent
- Parents Education: College or above / Other
- Family Income



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Methods (Cont.)

❖ Pre-College – Academic Preparation

- High School GPA
- SAT Combined
- AP/IB Accepted Credits: Yes / No

❖ In-College – Academics

- Academic Standing: Good / Probation / Suspension / Warning
- GPA and Credit Hours Earned
- Original College: Humanities & Sciences / Other



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Methodology (Cont.)

- ❖ **In-College – Financial Aid**
 - FASFA Applied: Yes / No
 - Aid Received: Yes / No
 - For those who applied for FASFA:
 - Percent of Need Met
 - Total Aid
- ❖ **In-College – Other**
 - On-Campus Housing: Yes / No



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Methods (Cont.)

Population (Fall 2007-Fall 2011 Cohorts)

Population	Total
Original Cohorts	18,286
Cohorts Started in the 3rd Semester	15,501
Cohorts Used in the Study*	15,037
Model I	15,037
Model II (FASFA = Yes)	7,267

* International students were omitted from all cohorts.



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Methodology (Cont.)

Initial Cohorts by Gender and Race/Ethnicity

Gender	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Total	%
Female	2162	2131	2095	2085	2132	10605	58%
Male	1645	1514	1495	1445	1582	7681	42%
Race/Ethnicity							
Native American	20	17	24	11	25	97	1%
Two or More Races	NA	NA	NA	152	186	338	2%
International	108	117	76	72	92	465	3%
Unknown	288	246	293	50	125	1002	5%
Hispanic	157	166	179	239	282	1023	6%
Asian/Pacific Island.	505	509	499	537	515	2565	14%
Black	783	729	704	660	704	3580	20%
White	1946	1861	1815	1809	1785	9216	50%
Grand Total	3807	3645	3590	3530	3714	18286	100%



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Limitations of the Study


- ❖ The variables/factors used in this study were based upon literature review and reliable data available at VCU. However, there are still many possible factors unaccounted for.
- ❖ Because the data collected were specific to this institution, any findings lack external validity and may not be generalizable across institutions.
- ❖ With separate cohorts over a 4-year period, there is a possibility of differences among cohorts which have not been accounted for. Our model assumes a certain degree of similarity among cohorts.




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Analysis & Findings (Univariate)					
Variable	Yr-1 Ret	Yr-2 Ret	Variable	Yr-1 Ret	Yr-2 Ret
Gender		F (+)	VCU GPA	(+)	(+)
Race/Ethnicity	Asian (+)	Asian (+)	Credit Hours Earned	(+)	(+)
Dependency	Dep. (+)	Dep. (+)	Original College	H S (-)	H S (-)
Parents Education	Bac. (+)		FASFA	Yes (-)	Yes (-)
Family Income	(+)		Aid (Y/N)	Yes (+)	Yes (+)
High School GPA	(+)	(+)	Percent of Need Met	(+)	(+)
SAT Combined	(+)	(+)	Total Aid	(+)	(+)
AP/IB Credits	Yes (+)	Yes (+)	Campus Housing	Yes (+)	Yes (+)
Academic Standing	Good (+)	Good (+)			


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Analysis & Findings (Multivariate)	
❖	Logistic Regression
❖	Model I
	Predictor Variables:
▪	Student Characteristics (Gender, Race/Ethnicity, Original College, On-Campus Housing)
▪	Pre-College Preparation (High School GPA, SAT, AP/IB)
▪	College Achievement (Credit Hours Earned, Academic Standing)
▪	Financial Aid (FASFA Application, Aid [Yes/No])

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Analysis & Findings (Model I)

Parameter	Est.	Odds Ratio	Parameter	Est.	Odds Ratio
Intercept	-0.703	0.495	Year-1 Housing (Y)	0.063	1.065
Gender (M)	0.030	1.031	Year-2 Housing (Y)	-0.128	0.880
Original College (HS)	-0.298	0.742	Year-2 Aid (Y)	0.672	1.959
Race/Ethnicity (Asian)	0.191	1.210	Year-2 FASFA (Y)	-0.831	0.436
Race/Ethnicity (Black)	0.172	1.187	AP/IB (Y)	0.125	1.134
Race/Ethnicity (Hispanic)	-0.139	0.870	High School GPA	0.316	1.371
Race/Ethnicity (Other)	0.032	1.032	SAT Combined	0.000	1.000
Year-2 Acad. Standing (P)	-1.655	0.191	Year-1 Credits	0.028	1.029
Year-2 Acad. Standing (S)	-3.477	0.031	Year-2 Credits	0.154	1.167
Year-2 Acad. Standing (W)	-1.927	0.146			




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Analysis & Findings (Model I)

❖ **Model I Assessment**

- Goodness-of-Fit Test (Hosmer and Lemeshow, Chi-square=11.356, p=0.182)
- McFadden R-square: 0.3494
- Area under ROC curve: 0.8068
- Overall accuracy: 89.20%



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Analysis & Findings (Multivariate)

❖ Model II (FASFA = Yes)

Predictor Variables:

- Student Characteristics (Gender, Race/Ethnicity, Original College, On-Campus Housing, Parents Education)
- Pre-College Preparation (High School GPA, SAT, AP/IB)
- College Achievement (Credit Hours Earned, Academic Standing)
- Financial Aid (Amount of Aid Received, Percent of Need Met)



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Analysis & Findings (Model II)

Parameter	Est.	Odds Ratio	Parameter	Est.	Odds Ratio
Intercept	-2.360	0.094	Year-1 Housing (Y)	-0.153	0.858
Gender (M)	0.042	1.043	Year-2 Housing (Y)	-0.162	0.850
Original College (HS)	-0.339	0.713	AP/IB	0.187	1.206
Race/Ethnicity (Asian)	0.224	1.251	Parents Ed (BA/BS) (Y)	0.027	1.028
Race/Ethnicity (Black)	0.199	1.220	High School GPA	0.243	1.275
Race/Ethnicity (Hispanic)	-0.089	0.915	SAT Combined	0.000	1.000
Race/Ethnicity (Other)	0.169	1.184	Year-1 Credits	0.043	1.044
Year-2 Acad. Standing (P)	-1.454	0.234	Year-2 Credits	0.148	1.160
Year-2 Acad. Standing (S)	-3.049	0.047	Year-2 Pct of Need Met	0.014	1.014
Year-2 Acad. Standing (W)	-1.844	0.158	Year-2 Total Aid	0.028	1.028



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Analysis & Findings (Model II)

❖ Model II Assessment

- Goodness-of-Fit Test (Hosmer and Lemeshow, Chi-square=12.125, p=0.146)
- McFadden R-square: 0.3503
- Area under ROC curve: 0.8186
- Overall accuracy: 88.40%



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Implications

❖ Model I

Strong predictors for second-year retention:

- Race/Ethnicity (Asian/Black +)
- High School GPA (+)
- Starting in College of Humanities & Sciences (-)
- Academic Standing (Good Standing +)
- Second-year's Last-term Credit Hours (+)
- FASFA Application (-)
- Aid Received (+)



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Implications (Cont.)

❖ Model II (those applying for financial aid)

Strong predictors for second-year retention:

- High School GPA (+)
- Starting in College of Humanities & Sciences (-)
- Academic Standing (Good Standing +)
- Second-year's Last-term Credit Hours (+)
- Amount of Aid Received (+)
- Percent of Need Met (+)

Race/Ethnicity is no longer a strong predictor.



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Top Ten States for Transfer-outs

	State	Number	Percentage
1	Virginia	1108	78.7%
2	Maryland	65	4.6%
3	New York	27	1.9%
4	North Carolina	24	1.7%
5	Washington DC	19	1.4%
6	California	15	1.1%
7	Pennsylvania	15	1.1%
8	Florida	12	0.9%
9	Arizona	11	0.8%
10	Other	111	7.5%
Total		1407	100%

Note: Total number of transfer-outs was 1407.



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Destinations of Transfer-outs

Top 10 VA Institutions for VCU Students Transferring Out (%)

1	VA Community Colleges	68%
2	GEORGE MASON UNIVERSITY	8%
3	OLD DOMINION UNIVERSITY	3%
4	VIRGINIA POLYTECH AND STATE UNIVERSITY	2%
Top 10 Transfers to VA Colleges		81%

Note: Total number of transfer-outs to VA institutions was 1108.



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Further Study

- ❖ Many studies showed that race/ethnicity is a significant predictor for retention. There may also be interactions between race/ethnicity and other predictors (Astin, 1997; Allen, 1999; Hall, 1999, Murtaugh et al., 1999).
 - Modeling each race group using a separate model
 - Testing the effects of interaction between race/ethnicity and other variables, e.g., race*gender, race*family income...
- ❖ Students with undeclared major in Humanities and Sciences
- ❖ Negative relationship between retention and those that applied for FASFA



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Thank You



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