Retention and Selectivity

In New Jersey Higher Education

Assessment 4

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Retention and Selectivity in New Jersey Higher Education

One of the major problems facing higher education today is a low retention rate among undergraduate students. This low retention rate is a factor in a low graduation rate, which is another major concern. Some estimate that half of all students who enter four-year universities have not earned a degree in five years (Gansemer-Topf & Schus, 2006). According to the U. S. Department of Education (2018), only 65.4% of all first-time, full-time undergraduates entering a four-year college in New Jersey in 2010 had earned a degree by 2016.

One factor which may be important in these low retention and graduation rates is that many high school graduates are underprepared for study at the undergraduate level (Bettinger & Long, 2009). These students often require remediation in mathematics and language arts, and if they are not successful in this remediation, they are likely to drop out of college. Even if the remediation is effective, these extra courses can extend the amount of time needed to complete a baccalaureate degree, and depress retention rates (Bettinger & Long, 2009).

This study will examine admission rates and retention rates at institutions of higher learning in New Jersey. Statistical analysis will be used to explore possible relationships between these two variables in both public and independent colleges and universities.

Dataset

The dataset for this study was constructed using several different reports available on the Department of Education, State of New Jersey (2018) website. The number of applications for admissions received by each institution, as well as the number of offers for admission, was collected for the three-year period 2013 to 2015. The number of first-time full-time enrollments, and the number of those students who registered for classes one year later, was also collected for the same period. The three years of data are described below. For the purposes of the analysis, a

three-year admissions rate was calculated, as well as a three-year retention rate. The dataset is attached as Appendix A.

Variables

Each year, all institutions of higher education in New Jersey are required to report specific data to the Department of Education. Included in this data is information on retention and admission data, among many other data points. For the purposes of this study, data regarding admissions and data regarding retention of first-time, full-time students who enrolled in the institution in the fall semester of one year and returned the next fall will be considered. This data will be used for a three-year period, from 2013 through 2015 (Department of Education, State of New Jersey, 2018).

The dataset contains two categorical variables, a public/independent indicator, and an institution type variable:

There are two possible values for the public/independent indicator:

Public – an institution that is supported by taxpayers

Independent – an institution that is private and whose primary source of financial support is not the state

Two possible values for the type indicator exist for the public institutions:

Senior – a four-year degree granting institution

Community – a two-year degree granting institution

Three possible values for the type indicator exist for the independent institutions:

Mission – a public mission institution, very much like a public university in offerings, but their primary source of support is not the state

Proprietary – a for-profit institution

Religious – an institution established for religious training which offers college credit. It is important to note that all institutions which are affiliated with religious groups are not included in the Religious category.

In addition to the categorical variables, the dataset also contains two quantitative variables, retention rate and admission rate. The retention rate is calculated by taking the number of first-time, full-time undergraduates who enrolled in the fall semester of a given year in the denominator and comparing that number to the number of those undergraduates who enrolled again in the following year.

The admission rate was calculated by taking the number of first-time full-time applications received and comparing it to the offers to enroll that were extended.

Sample

The sample includes a total of 65 New Jersey higher education institutions:

10 public senior colleges and universities

19 public community colleges

16 independent public-mission colleges and universities

10 independent proprietary institutions

10 independent religious institutions

Institutions which had missing data were eliminated from the sample, resulting in a total of 53 institutions included in the analysis. All of the data for this study deals with first-time, full-time enrollments. Therefore, transfers from other institutions are not considered in these statistics. It is not possible to estimate total undergraduate enrollment from this data. For example, many graduates of the community colleges transfer to the public senior colleges and

universities to complete their baccalaureate degrees. These students are not included in the statistics for the public senior colleges.

An indication of the relative size of these institution types can be obtained by examining the relative size of the first-time, full-time groups in each type of institution:

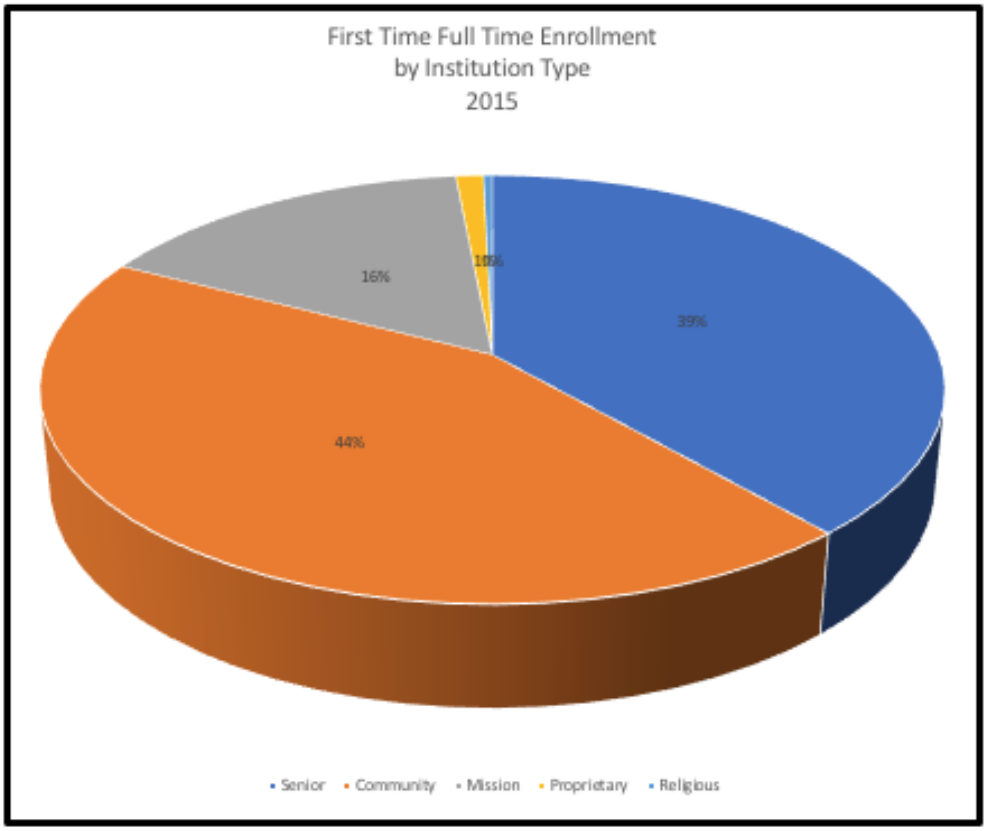


Figure 1 First-Time Full-Time Enrollment by Institution Type, 2015

First Time Full Time Enrollments
By Institution Type
2015

Type of Institution	Number of FTFT Enrollments	Percent of Total FTFT Enrollments
Senior	21670	39%
Community	24730	44%
Mission	8982	16%
Proprietary	642	1%
Religious	211	0%
Total	56235	100%

Table 1 First-Time Full-Time Enrollment by Institution Type, 2015

Figure 1 above demonstrates that the majority of first-time full-time students in New Jersey enroll in public institutions, both senior and community. The overall number of students enrolling in proprietary and religious institutions is comparatively small.

Acceptance Rates

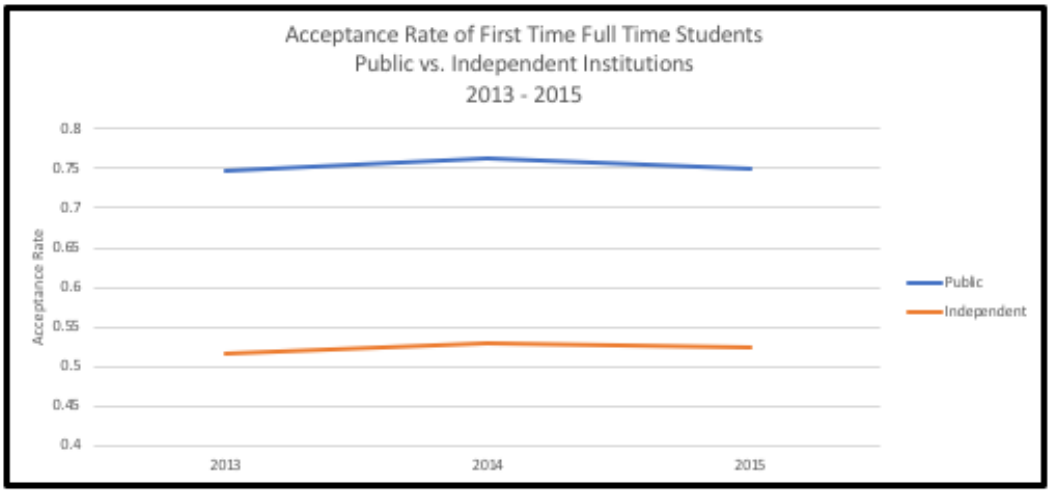


Figure 2 Acceptance Rate of First-Time Full-Time Students, Public vs. Independent Institutions

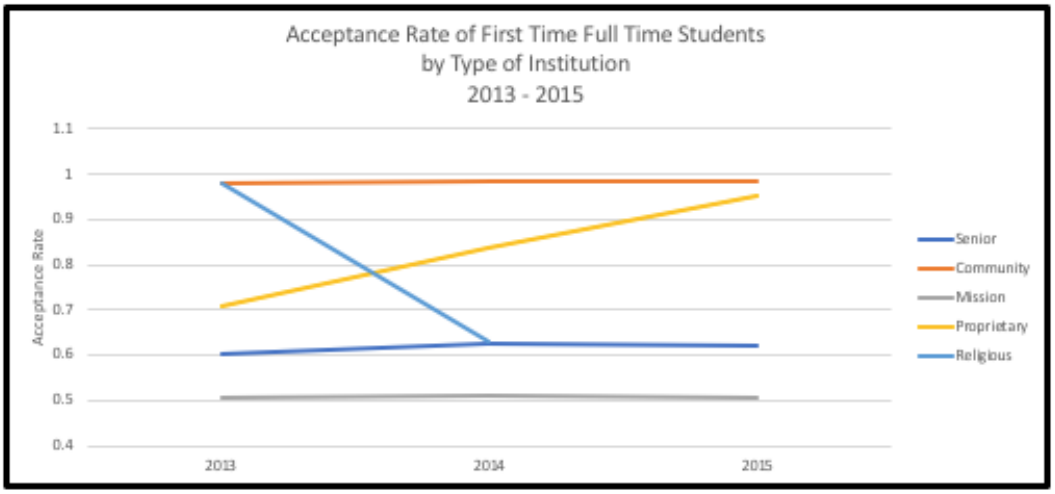


Figure 3 Acceptance Rate of First-Time Full-Time Students by Type of Institution

2013 – 2015

The figures above provide important information, as they appear to be contradictory to some extent. From Figure 2, it appears that public institutions are significantly less selective than independent institutions. However, Figure 3 shows that the community college segment is the least selective, with a steady rate of 100% acceptance. In contrast, the public senior colleges and universities are among the most selective segments, second only to the independent public mission institutions.

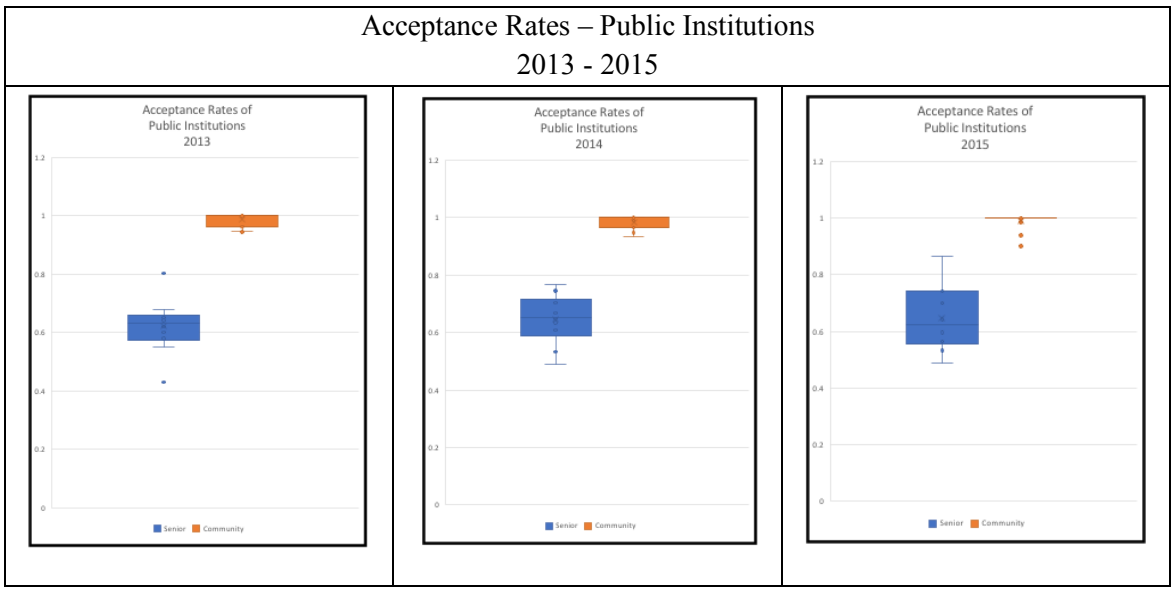


Figure 4 Acceptance Rates – Public Institutions – 2013 - 2015

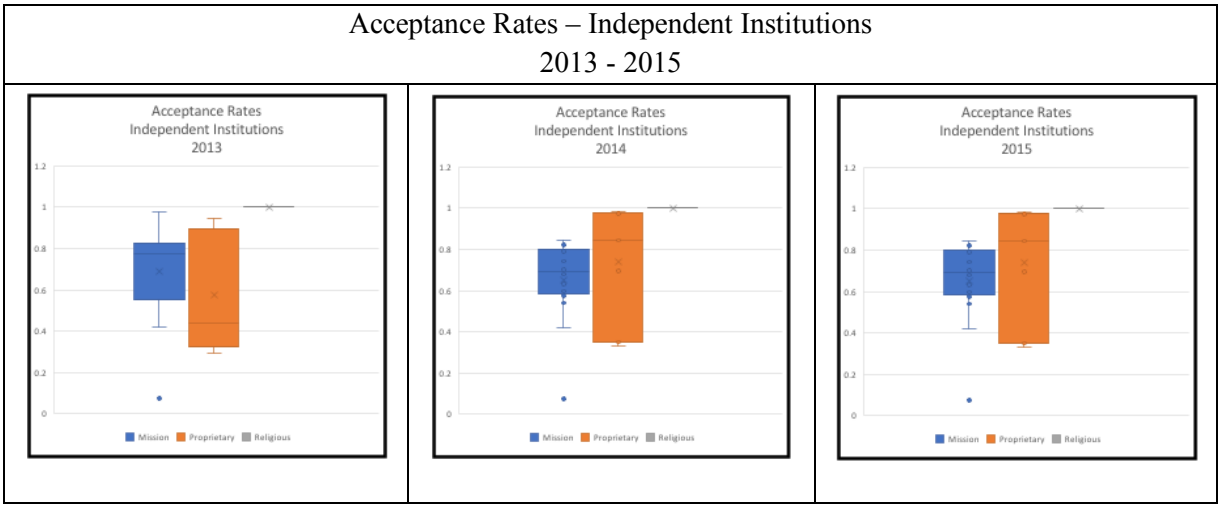


Figure 5 Acceptance Rates – Independent Institutions – 2013 to 2015

The images in Figures 4 and 5 show the range of acceptance rates for public and independent institutions by type. Although there is some variation year-to-year, the ranges are fairly stable. It is noteworthy that the community colleges and the religious institutions are consistently at or close to 100% acceptance, with little variation.

Retention rates

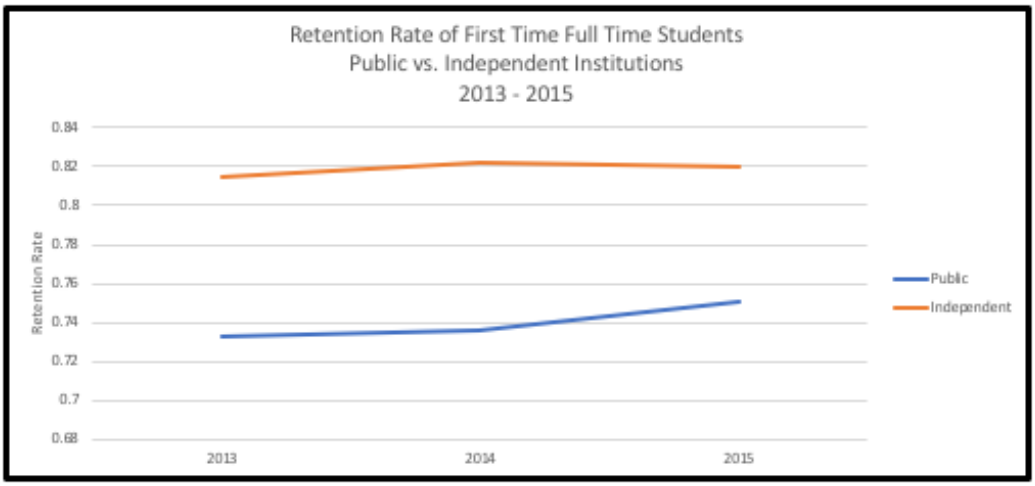


Figure 6 Retention Rate of First-Time Full-Time Students, Public vs. Independent Institutions, 2013 - 2015

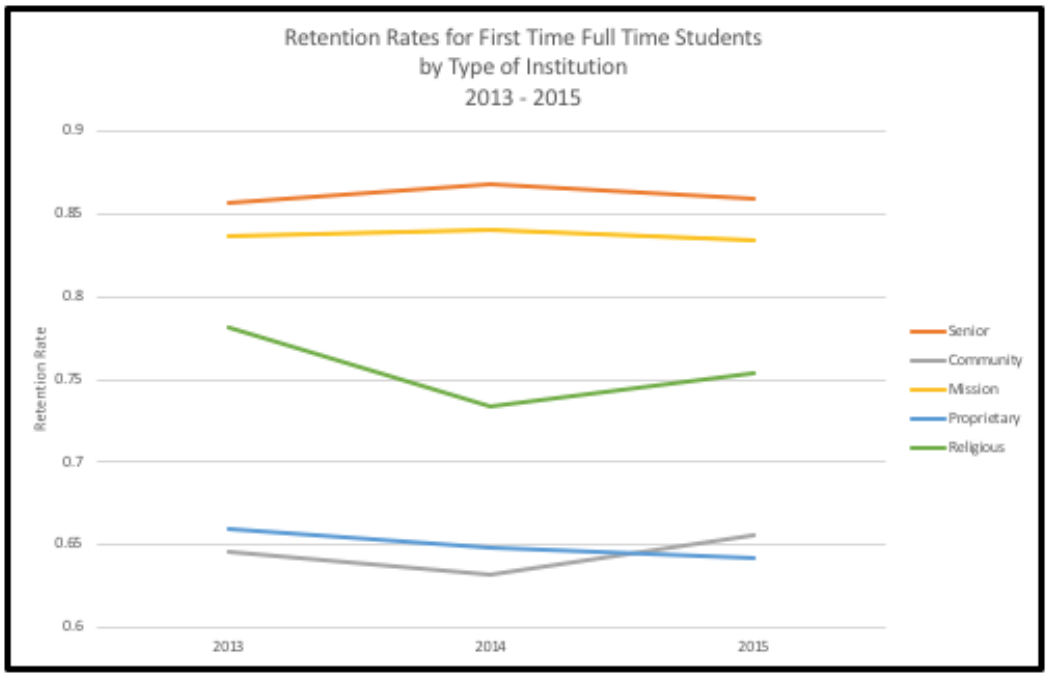


Figure 7 Retention Rates for First-Time Full-Time Students by Institution Type, 2013 – 2015

Figures 6 and 7 take a similar approach to retention rates. In Figure 6, the retention rate for independent institutions is higher than that of public colleges. However, the same analysis in light of institution type in Figure 7 tells a different story. In this case, public senior colleges enjoy the highest retention rate, followed closely by the independent public-mission colleges. Community colleges and proprietary colleges have the lowest retention rates.

Statistical Analysis for All Institutions

A statistical analysis called a t-test is used to compare the means of two groups (Salkind, 2017). A t-test was conducted to determine if the means of the public and independent groups were the same. The null hypothesis in this case is that there is no difference between the means of the admission rate of the groups. The research hypothesis is that there is a difference between the means of the admission rate of the groups.

Group Statistics

	PubIndy	N	Mean	Std. Deviation	Std. Error Mean
Select	Public	29	.866981220	.177903478	.033035847
	Indy	24	.694358601	.215210682	.043929697

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Select	Equal variances assumed	.033	.858	3.198	51	.002	.172622619	.053979259	.064254735	.280990504
	Equal variances not assumed			3.141	44.642	.003	.172622619	.054965311	.061892306	.283352932

An independent-samples t-test was conducted to compare admissions rate in public and independent conditions. There was a significant difference in the scores for public (M=.867, SD=.178) and independent (M=.694, SD=.215) conditions; t(51)=3.20, p = .002. Therefore, we can reject the null hypothesis.

A t-test was conducted to determine if the means of the public and independent groups were the same with respect to their retention rate. The null hypothesis in this case is that there is no difference between the means of the retention rate of the groups. The research hypothesis is that there is a difference between the means of the retention rate of the groups.

T-Test

Group Statistics

	PubIndy	N	Mean	Std. Deviation	Std. Error Mean
Retain	Public	29	.712758621	.105563901	.019602724
	Indy	24	.741041667	.162076749	.033083778

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Retain	Equal variances assumed	1.900	.174	-.765	51	.448	-.02828305	.036986687	-.10253692	.045970827
	Equal variances not assumed			-.735	38.124	.467	-.02828305	.038455210	-.10612320	.049557109

An independent-samples t-test was conducted to compare retention rate in public and independent conditions. There was not a significant difference in the scores for public (M=.713, SD=.106) and independent (M=.741, SD=.162) conditions; t(51)=-.765, p = .448. Therefore, we cannot reject the null hypothesis.

Measures of central tendency

Measures of central tendency were computed to summarize the data for the admissions rate variable. Measures of dispersion were computed to understand the variability of scores for the admissions rate variable. The following are the results of this analysis; N = 53, M=.789, SD =.212.

Measures of central tendency were computed to summarize the data for the retention rate variable. Measures of dispersion were computed to understand the variability of scores for the retention rate variable. The following are the results of this analysis; N = 53, M=.726, SD=.133.

Descriptive Statistics

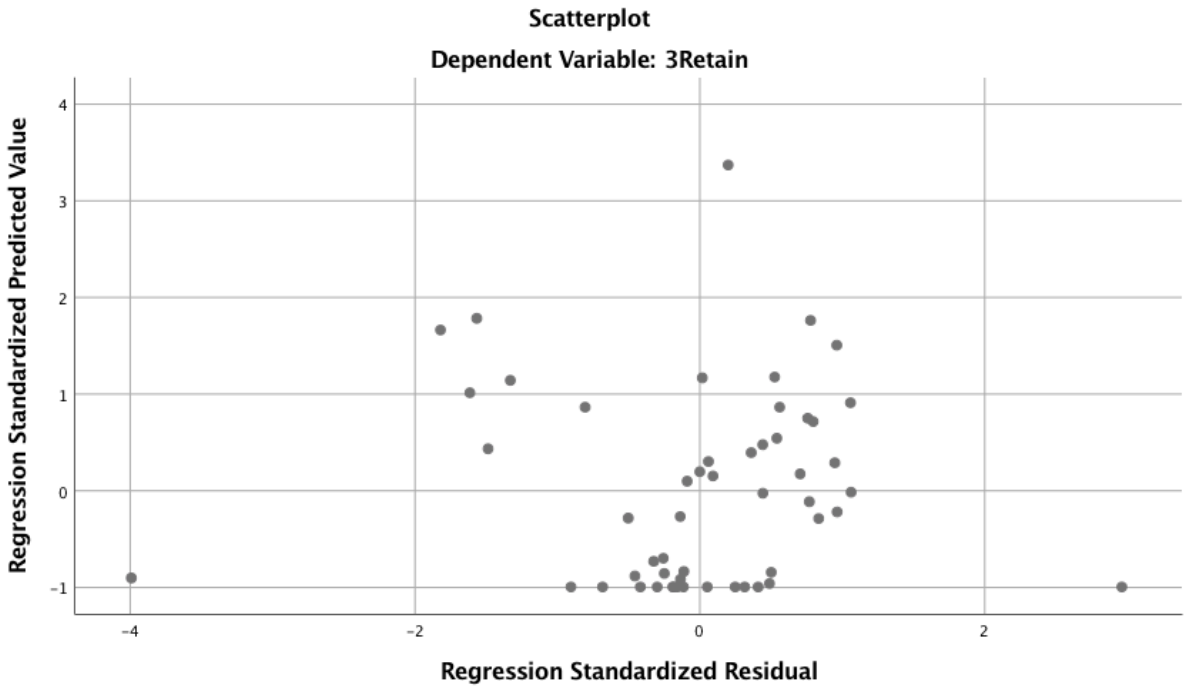
	Mean	Std. Deviation	N
3 Year Retention	.725566038	.133496864	53
3 Year Accepted	.788812487	.212257412	53

Correlation

A Pearson product-moment correlation coefficient was computed to assess the relationship between the admissions rate and the retention rate. There was a weak negative correlation between the two variables [r = -.514, n =53, p = .000].

Correlations

		3 Year Retention	3 Year Accepted
Pearson Correlation	3 Year Retention	1.000	-.514
	3 Year Accepted	-.514	1.000
Sig. (1-tailed)	3 Year Retention	.	.000
	3 Year Accepted	.000	.
N	3 Year Retention	53	53
	3 Year Accepted	53	53



The scatterplot locates each data point on a grid. It would be difficult to fit a line to this graph, which further illustrates the weakness of the correlation.

Statistical Analysis – Selective Institutions Only

Many institutions in New Jersey have an open admissions policy (CollegeCalc, 2018). Under this policy, anyone with a high school diploma or GED is entitled to attend. This type of admissions policy originated with the Morrill Act in the 19th century, which started land-grant colleges to teach agriculture and mechanical arts. Today, most community colleges have adopted an open admissions policy to allow greater accessibility to college in local areas, and to reduce the cost of earning a four-year degree. Today, many students begin their pursuit of a higher education in community colleges, then transfer to a senior college to complete their baccalaureate degree (City University of New York, n.d.)

In contrast, a selective college is simply an institution that does not admit everyone (CollegeData, 2018). It may admit most applicants, or only a select few. For example, most of

the public senior colleges and universities in New Jersey admit 50% or more of applicants, while highly selective Princeton University admits less than 10% (CollegeCalc, 2018). Selectivity alone is not necessarily an indicator of the quality of the institution.

Many New Jersey institutions are open admissions colleges, and there was some concern that including those institutions could skew the study results. Therefore, the open admissions colleges were removed from the sample, and the analysis was completed again. This resulted in the elimination of all of the community colleges, two proprietary colleges and one religious institution.

A t-test was conducted to determine if the means of the new public and independent groups were the same. The null hypothesis in this case is that there is no difference between the means of the admission rate of the groups. The research hypothesis is that there is a difference between the means of the admission rate of the groups.

T-test

Group Statistics

	PubIndy	N	Mean	Std. Deviation	Std. Error Mean
3Accept	Public	10	.637618449	.091817722	.029035313
	Indy	21	.678979146	.202946195	.044286491

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
3Accept	Equal variances assumed	3.505	.071	-.611	29	.546	-.04136070	.067670779	-.17976298	.097041586
	Equal variances not assumed			-.781	28.987	.441	-.04136070	.052956044	-.14967005	.066948653

An independent-samples t-test was conducted to compare admissions rate in public and independent conditions. There was not a significant difference in the scores for public (M=.638, SD=.092) and independent (M=.679, SD=.203) conditions; t(29)=-.611, p = .546. Therefore, we cannot reject the null hypothesis.

Group Statistics

	PubIndy	N	Mean	Std. Deviation	Std. Error Mean
3Retain	Public	10	.836266667	.069592252	.022007002
	Indy	21	.738952381	.160290683	.034978295

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
3Retain	Equal variances assumed	2.473	.127	1.827	29	.078	.097314286	.053269066	-.01163319	.206261758
	Equal variances not assumed			2.355	28.903	.026	.097314286	.041325407	.012782056	.181846515

An independent-samples t-test was conducted to compare retention rate in public and independent conditions. There was not a significant difference in the scores for public (M=.836, SD=.070) and independent (M=.739, SD=.160) conditions; t(29)=1.83, p = .078. Therefore, we cannot reject the null hypothesis.

Measures of central tendency

Measures of central tendency were computed to summarize the data for the admissions rate variable. Measures of dispersion were computed to understand the variability of scores for the admissions rate variable. The following are the results of this analysis; N = 31, M=.666, SD=.174.

Measures of central tendency were computed to summarize the data for the retention rate variable. Measures of dispersion were computed to understand the variability of scores for the retention rate variable. The following are the results of this analysis; N = 31, M=.770, SD=.144.

Descriptive Statistics

	Mean	Std. Deviation	N
3Retain	.770344086	.143944652	31
3Accept	.665636986	.174280069	31

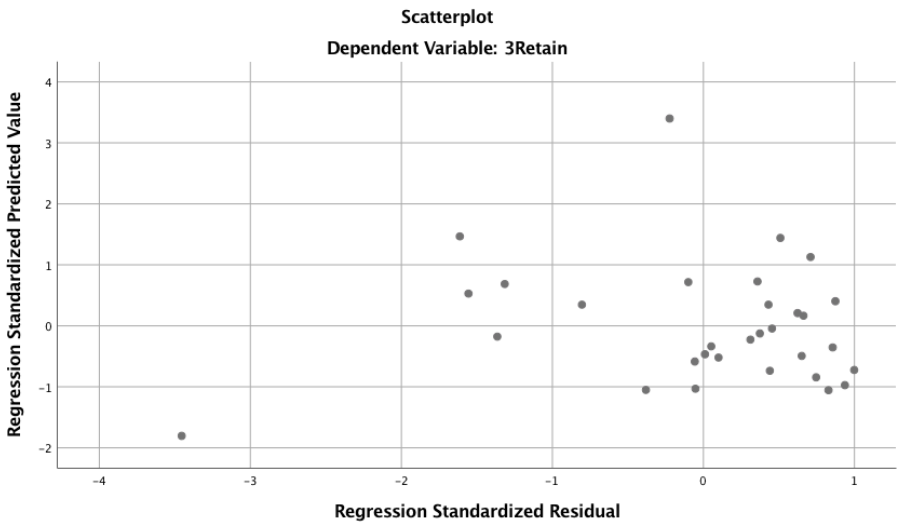
Correlation

A Pearson product-moment correlation coefficient was computed to assess the relationship between the admissions rate and the retention rate. There was a weak negative correlation between the two variables [r = -.486, n =31, p = .003].

Correlations

		3Retain	3Accept
Pearson Correlation	3Retain	1.000	-.486
	3Accept	-.486	1.000
Sig. (1-tailed)	3Retain	.	.003
	3Accept	.003	.
N	3Retain	31	31
	3Accept	31	31

The correlation between the acceptance rate variable and the retention rate variable remained weak, despite removing the data that was believed to be potentially skewing the results. Similarly, the scatterplot still does not indicate that a trend line could be fit to the data, reinforcing the finding that the correlation is weak.



Conclusion

This small study demonstrates that there are multiple factors to consider when addressing a pervasive issue such as the retention rate for students in a complex higher education system. Public and independent institutions have different problems, and each college has its own mission and goals. There is only a remote chance of developing a universal solution to this issue.

The problem of low retention and graduation rates in our higher education system is very important. Countless students walk away from the potential benefits of a bachelor's degree, while incurring debt to finance their education. The government spends millions of dollars to provide financial aid and remedial programs to help these students succeed. The relationship between admission selectivity and retention is weak, but it is present. To try to simplify the reasons for low retention rates to a few variables is imprudent, and it is important that research is conducted to try to find other key variables. Each variable that is identified can lead to programs and methods that can help all students realize their dreams.

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Appendix A

Dataset

Institution	Public/ Independent	Type	3 Year Applications	3 Year Offers	3 Year Accepted	3 Year FTFT Enrollment	3 Year Retention	Admission Status
TCNJ	Public	Senior	33372	15656	0.469	4267	0.940	Selective
Kean	Public	Senior	18614	13903	0.747	4466	0.739	Selective
Montclair	Public	Senior	37464	25229	0.673	9017	0.825	Selective
NJIT	Public	Senior	15166	9545	0.629	2910	0.865	Selective
NJCU	Public	Senior	8373	6333	0.756	1988	0.747	Selective
Ramapo	Public	Senior	20102	10835	0.539	2805	0.867	Selective
Rowan	Public	Senior	31653	19159	0.605	5882	0.850	Selective
Rutgers	Public	Senior	154677	92097	0.595	23928	0.910	Selective
Stockton	Public	Senior	16838	10723	0.637	3402	0.867	Selective
WPU	Public	Senior	28424	20592	0.724	3783	0.753	Selective
Atlantic Cape	Public	Community	7423	7423	1.000	3220	0.609	Open
Bergen	Public	Community	27510	25776	0.937	7787	0.648	Open
Brookdale	Public	Community	15672	15672	1.000	6792	0.694	Open
Burlington	Public	Community	10418	10418	1.000	5064	0.639	Open
Camden	Public	Community	27826	27826	1.000	5345	0.623	Open
Cumberland	Public	Community	4631	4631	1.000	2281	0.635	Open
Essex	Public	Community	18324	18324	1.000	5718	0.578	Open
Gloucester	Public	Community	13074	13074	1.000	5153	0.644	Open
Hudson	Public	Community	12574	12574	1.000	5989	0.553	Open
Mercer	Public	Community	6905	6905	1.000	3393	0.663	Open
Middlesex	Public	Community	14235	13750	0.966	5858	0.655	Open
Morris	Public	Community	9269	8971	0.968	3917	0.726	Open
Ocean	Public	Community	11199	11199	1.000	5021	0.705	Open
Passaic	Public	Community	11749	11089	0.944	2381	0.638	Open
Raritan	Public	Community	7471	7415	0.993	3543	0.716	Open
Salem	Public	Community	1190	1170	0.983	656	0.647	Open
Sussex	Public	Community	2844	2844	1.000	1513	0.686	Open
Union	Public	Community	15834	15454	0.976	4800	0.612	Open
Warren	Public	Community	1453	1453	1.000	819	0.636	Open
Bloomfield	Independent	Mission	9192	5564	0.605	1279	0.692	Selective
Caldwell	Independent	Mission	9097	6255	0.688	1063	0.809	Selective
Centenary	Independent	Mission	3420	2906	0.850	654	0.802	Selective
Drew	Independent	Mission	9868	7178	0.727	1057	0.855	Selective
FDU- F	Independent	Mission	12101	9836	0.813	1896	0.807	Selective
FDU- M	Independent	Mission	13863	10644	0.768	1294	0.722	Selective
Felician	Independent	Mission	4997	4174	0.835	717	0.822	Selective
Georgian Cou	Independent	Mission	3570	2835	0.794	652	0.775	Selective
Monmouth	Independent	Mission	20919	15726	0.752	3090	0.819	Selective
Pillar	Independent	Mission	397	337	0.849	87	0.648	Selective
Princeton	Independent	Mission	80429	5894	0.073	3911	0.980	Selective
Rider	Independent	Mission	27293	19243	0.705	2769	0.794	Selective
CSE	Independent	Mission	6259	3419	0.546	366	0.650	Selective
St Peters	Independent	Mission	18435	9969	0.541	1756	0.808	Selective
Seton Hall	Independent	Mission	32190	25494	0.792	4005	0.847	Selective
Stevens	Independent	Mission	13740	5697	0.415	2042	0.936	Selective
Berkeley	Independent	Proprietary	7061	6852	0.970	784	0.638	Open
Devry	Independent	Proprietary	951	804	0.845	255	0.691	Selective
Eastwick	Independent	Proprietary	2788	1599	0.574	634	0.608	Selective
ITT Tech	Independent	Proprietary	456	447	0.980	71	0.202	Selective
Jersey	Independent	Proprietary	145	101	0.697	293	0.583	Selective
Strayer	Independent	Proprietary	729	299	0.410	17	0.667	Selective
U Phoenix	Independent	Proprietary	101	44	0.436	57	0.629	Open
Assumption	Independent	Religious	18	18	1.000	21	1.000	Selective

Sources for Original Dataset

Variables	**Source**
Institution Public/Independent Institution Type 2013 Admissions	http://www.state.nj.us/highereducation/statistics/ADMT2013s.pdf
2013 Retention	http://www.state.nj.us/highereducation/documents/pdf/statistics/retention/Retention2013-2014.pdf
2014 Admissions	http://www.state.nj.us/highereducation/statistics/ADMT2014s.pdf
2014 Retention	http://www.state.nj.us/highereducation/documents/pdf/statistics/retention/Retention2014-2015.pdf
2015 Admissions	http://www.state.nj.us/highereducation/statistics/ADMT2015s.pdf
2015 Retention	http://www.state.nj.us/highereducation/documents/pdf/statistics/retention/Retention2016.pdf
Admission Status	http://www.collegecalc.org/colleges/new-jersey/open-admissions/