

I1: JUST WHAT IS RETENTION ANYWAY?

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SO, WHAT IS RETENTION?

It Depends

On whom wants to know

What is the business question?



DIFFERENT PERSPECTIVES OF RETENTION

- Legislators/"System" Executives – Enrolled anywhere
 - Institutional Reporting – Enrolled here
 - Deans – Enrolled in my college
 - Chairs – Enrolled in my program or major
-

ASK THE GOVERNMENT!

- <https://studentaid.gov/help-center/answers/article/retention-rate>

- **Retention rate**

A school's retention rate is the percentage of its first-time students who are seeking bachelor's degrees who return to the institution to continue their studies the following fall.

ISSUES WITH THIS DEFINITION

- ??????
 - Full/Part time
 - Transfers
 - Institutional perspective
-

COMMON DATA SET DEFINITION

- **B22.** For the cohort of all full-time bachelor's (or equivalent) degree-seeking undergraduate students who entered your institution as first-year students in Fall 2021 (or the preceding summer term), what percentage was enrolled at your institution as of the date your institution calculates its official enrollment in Fall 2022?

ALLOWABLE ADJUSTMENTS

- The initial cohort may be adjusted for students who departed for the following reasons:
 - death
 - permanent disability
 - service in the armed forces
 - foreign aid service of federal government
 - official church missions
-

THE INSPIRATION QUESTION:

How do you report fall to fall retention by major? I have tried a couple of methods, and each has its weaknesses.

With one method, I only count a student as retained if he or she stayed in the same major from fall1 to fall2. Using this method, my results seem too low - if a major has 2 students and both of them change to other majors within the university, the fall to fall retention for that major = 0% even though those students are still at the university.

THE INSPIRATION QUESTION:

With the other method, I create a list of students in fall 1, and using only students on that list, I count how many are enrolled in each major in fall 1 and in fall 2. Using this method, my results seem too high - if a major has 2 students and 2 new majors transfer into it, the fall to fall retention for that major = 200%, which seems basically meaningless.

ISSUES NOT FULLY ADDRESSED BY POPULAR DEFINITIONS

- Retention by major
 - Change major but stay at University
 - Additional transfers into major
-

POSSIBLE SOLUTIONS

- Retention \neq Net Enrollment
 - Net Enrollment = aggregate numbers
 - Retention = status of individual students
 - Decide which to report
 - Consider “reverse retention” or reverse triangle
 - Establish a cohort
 - Consider transfers separately
-

POSSIBLE SOLUTIONS

- Report multiple parameters
 - Enrolled
 - Original major
 - Different major
 - Graduated
 - From original major
 - From different major
 - Gone
-

EXAMPLES – TRADITIONAL VIEW



Fall to Fall Retention & Graduation Rates

By Student Type and Residence Hall

Entry Term

All

Student Type

All

Entry College

All

Entry Department

All

N-Year Retention Entry Term	0					1					2					3				
	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate
<input type="checkbox"/> Fall 2016	3,933		100.0%			3,492	441	88.8%			3,232	657	83.1%	44	1.1%	2,937	718	80.4%	278	7.1%
<input type="checkbox"/> First-Time Freshman	3,503		100.0%			3,136	367	89.5%			2,943	557	84.1%	3	0.1%	2,822	607	82.3%	74	2.1%
<input type="checkbox"/> Transfer Student	430		100.0%			356	74	82.8%			289	100	74.3%	41	9.5%	115	111	50.9%	204	47.4%
<input type="checkbox"/> Fall 2017	3,686		100.0%			3,247	439	88.1%			2,993	656	82.0%	37	1.0%	2,690	704	79.3%	292	7.9%
<input type="checkbox"/> First-Time Freshman	3,320		100.0%			2,948	372	88.8%			2,752	565	83.0%	3	0.1%	2,609	600	81.3%	111	3.3%
<input type="checkbox"/> Transfer Student	366		100.0%			299	67	81.7%			241	91	72.6%	34	9.3%	81	104	43.8%	181	49.5%
<input type="checkbox"/> Fall 2018	3,718		100.0%			3,275	443	88.1%			3,061	611	83.4%	46	1.2%	2,692	715	79.0%	311	8.4%
<input type="checkbox"/> First-Time Freshman	3,366		100.0%			2,974	392	88.4%			2,827	538	84.0%	1	0.0%	2,613	631	80.5%	122	3.6%
<input type="checkbox"/> Transfer Student	352		100.0%			301	51	85.5%			234	73	76.2%	45	12.8%	79	84	48.5%	189	53.7%
<input type="checkbox"/> Fall 2019	3,660		100.0%			3,295	365	90.0%			3,037	574	84.1%	49	1.3%	2,682	639	80.8%	339	9.3%
<input type="checkbox"/> First-Time Freshman	3,307		100.0%			2,998	309	90.7%			2,811	493	85.1%	3	0.1%	2,613	550	82.6%	144	4.4%
<input type="checkbox"/> Transfer Student	353		100.0%			297	56	84.1%			226	81	73.6%	46	13.0%	69	89	43.7%	195	55.2%
<input type="checkbox"/> Fall 2020	4,088		100.0%			3,591	497	87.8%			3,324	703	82.5%	61	1.5%					
<input type="checkbox"/> First-Time Freshman	3,731		100.0%			3,296	435	88.3%			3,097	628	83.1%	6	0.2%					
<input type="checkbox"/> Transfer Student	357		100.0%			295	62	82.6%			227	75	75.2%	55	15.4%					
<input type="checkbox"/> Fall 2021	4,635		100.0%			4,157	477	89.7%	1	0.0%										
<input type="checkbox"/> First-Time Freshman	4,271		100.0%			3,854	417	90.2%												
<input type="checkbox"/> Transfer Student	364		100.0%			303	60	83.5%	1	0.3%										
Total	23,720		100.0%			21,057	2,662	88.8%	1	0.0%	15,647	3,201	83.0%	237	1.2%	11,001	2,776	79.9%	1,220	8.1%

EXAMPLES – SPECIFIC MAJOR



Baylor University
OFFICE OF INSTITUTIONAL RESEARCH

Program Migration History

Program by Term for Selected Entry Cohort

Entry Term

Fall 2018

Student Type

First-Time Freshman

Entry College & Dept.

Arts & Sciences (Entr...)

Entry Program

Biology (BS)

Elapsed Terms

Type	0					1					2					3				
	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	
<input checked="" type="checkbox"/> First-Time Freshman	486		100.0%			462	24	95.1%			430	56	88.5%			416	70	85.6%		
Accounting (BBA)																				
Anthropology (BA)											1		100.0%			1		100.0%		
Anthropology (BS)																2		100.0%		
Aviation Sciences (BSA)											1		100.0%			1		100.0%		
Baylor Business Fellows (BBA)						3		100.0%			4		100.0%			4		100.0%		
Biochemistry (BA)																				
Biochemistry (BS)											4		100.0%			4		100.0%		
Bioinformatics (BSI)						2		100.0%			1		100.0%							
Biology (BA)																				
Biology (BS)	486		100.0%			386	24	94.1%			284	47	85.8%			238	53	81.8%		
Chemistry (BS)																				
Clinical Laboratory Science (BS)						1		100.0%			1		100.0%			1		100.0%		
Comm Sciences and Disorders (BA)						2		100.0%			7		100.0%			6	1	85.7%		
Comm Sciences and Disorders (BS)											1		100.0%			1		100.0%		
Communication (BA)						1		100.0%			2	1	66.7%			4	2	66.7%		
Computer Science (BSCS)											1		100.0%			1		100.0%		
Data Science (BSI)																				
Economics (BBA)																				
Economics (BS)						1		100.0%			1		100.0%			1		100.0%		
Elementary Education (BSED)						1		100.0%			3		100.0%			3		100.0%		
English (BA)											1		100.0%			2		100.0%		
Entr and Corporate Innovation (BBA)																				
Environmental Health Science (BS)						2		100.0%			2		100.0%			2		100.0%		
Environmental Science (BS)						1		100.0%			1		100.0%			1		100.0%		
Environmental Studies (BA)											3		100.0%			3		100.0%		
Exercise Physiology (BS)																2		100.0%		
Finance (BBA)																				
Total	486		100.0%			462	24	95.1%			430	56	88.5%			416	70	85.6%		

EXAMPLES – SPECIFIC MAJOR

Elapsed Terms Type	0					1					2		
	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention
<input checked="" type="checkbox"/> First-Time Freshman	486		100.0%			462	24	95.1%			430	56	88.5%
Accounting (BBA)													
Anthropology (BA)											1		100.0%
Anthropology (BS)													
Aviation Sciences (BSA)											1		100.0%
Baylor Business Fellows (BBA)						3		100.0%			4		100.0%
Biochemistry (BA)													
Biochemistry (BS)											4		100.0%
Bioinformatics (BSI)						2		100.0%			1		100.0%
Biology (BA)													
Biology (BS)	486		100.0%			386	24	94.1%			284	47	85.8%

Cohort Fall to Fall Retention = Enrolled / (Enrolled + Left)

$$430 / (430 + 56) = 88.5\%$$

NOTE: By using only Enrolled and Left in the denominator, graduates are automatically removed from the cohort for retention calculation.

EXAMPLES – SPECIFIC MAJOR

Elapsed Terms Type	0					1					2		
	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention
<input checked="" type="checkbox"/> First-Time Freshman	486		100.0%			462	24	95.1%			430	56	88.5%
Accounting (BBA)													
Anthropology (BA)											1		100.0%
Anthropology (BS)													
Aviation Sciences (BSA)													100.0%
Baylor Business Fellows (BBA)						3		100.0%					100.0%
Biochemistry (BA)													
Biochemistry (BS)											4		100.0%
Bioinformatics (BSI)						2		100.0%			1		100.0%
Biology (BA)													
Biology (BS)	486		100.0%			386	24	94.1%			284	47	85.8%

Major Fall to Fall Retention = Enrolled@major / (Enrolled + Left)@cohort

$$284 / (430 + 56) = 58.4\%$$

NOTE: Manual calculation, not included on dashboard.

EXAMPLES – SPECIFIC MAJOR

Elapsed Terms Type	0					1					2		
	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention
<input checked="" type="checkbox"/> First-Time Freshman	486		100.0%			462	24	95.1%			430	56	88.5%
Accounting (BBA)													
Anthropology (BA)											1		100.0%
Anthropology (BS)													
Aviation Sciences (BSA)											1		100.0%
Baylor Business Fellows (BBA)						3		100.0%			4		100.0%
Biochemistry (BA)													
Biochemistry (BS)											4		100.0%
Bioinformatics (BSI)						2		100.0%			1		100.0%
Biology (BA)													
Biology (BS)	486		100.0%			386	24	94.1%			284	47	85.8%

Intra-Major Fall to Fall Retention = $\text{Enrolled} / (\text{Enrolled} + \text{Left})$

$$284 / (284 + 47) = 85.8\%$$

NOTE: By using only Enrolled and Left in the denominator, graduates are automatically removed from the cohort for retention calculation.

EXAMPLES – GRADUATION RATES

Entry Term

Fall 2018

Student Type

First-Time Freshman

Entry College & Dept.

Arts & Sciences (Entr...)

Entry Program

Biology (BS)



Elapsed Terms Type	4				5				6				7				8				
	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate
First-Time Freshman		403	83	82.9%			385	89	81.2%	12	2.5%	344	95	78.4%	47	9.7%	60	100	37.5%	326	67.1%
Accounting (BBA)		5		100.0%			5		100.0%			5	1	83.3%			4		100.0%	1	20.0%
Anthropology (BA)		1		100.0%			1		100.0%				1					1			
Anthropology (BS)		2	1	66.7%			2	1	66.7%	1	25.0%	2	1	66.7%	1	25.0%		1		3	75.0%
Aviation Sciences (BSA)		1		100.0%			1		100.0%			1		100.0%						1	100.0%
Baylor Business Fellows (BBA)		4		100.0%			4		100.0%			4		100.0%						4	100.0%
Biochemistry (BA)		1		100.0%						1	100.0%				1	100.0%				1	100.0%
Biochemistry (BS)		5		100.0%			6		100.0%			5	1	83.3%				2		3	60.0%
Bioinformatics (BSI)																					
Biology (BA)		1		100.0%																	
Biology (BS)		205	57	78.2%			197	58	77.3%	5	1.9%	174	59	74.7%	27	10.4%	18	64	22.0%	176	68.2%
Chemistry (BS)		1		100.0%			1		100.0%			1		100.0%						1	100.0%
Clinical Laboratory Science (BS)																					
Comm Sciences and Disorders (BA)		6	2	75.0%			5	3	62.5%			5	3	62.5%				3		5	62.5%
Comm Sciences and Disorders (BS)		2		100.0%			2		100.0%			2		100.0%						2	100.0%
Communication (BA)		7	3	70.0%			7	3	70.0%			6	4	60.0%			1	3	25.0%	6	60.0%
Computer Science (BSCS)																					
Data Science (BSI)		2		100.0%			1		100.0%			1		100.0%			1		100.0%		
Economics (BBA)		2		100.0%			2		100.0%			2		100.0%						2	100.0%
Economics (BS)																					
Elementary Education (BSED)		3		100.0%			3		100.0%			3		100.0%						3	100.0%
English (BA)		2		100.0%			2		100.0%			2		100.0%						2	100.0%
Entr and Corporate Innovation (BBA)		1		100.0%			1		100.0%												
Environmental Health Science (BS)																					
Environmental Science (BS)		2		100.0%			2		100.0%			1		100.0%						1	100.0%
Environmental Studies (BA)		3		100.0%			3		100.0%			3		100.0%	1	25.0%	1	1	50.0%	2	50.0%
Exercise Physiology (BS)		2		100.0%			2		100.0%			2		100.0%						2	100.0%
Finance (BBA)		2		100.0%			3		100.0%			4		100.0%				1		3	75.0%
Total		403	83	82.9%			385	89	81.2%	12	2.5%	344	95	78.4%	47	9.7%	60	100	37.5%	326	67.1%

EXAMPLES – GRADUATION RATES

Elapsed Terms Type	4			5			6			7			8									
	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	
<input type="checkbox"/> First-Time Freshman		403	83	82.9%			385	89	81.2%	12	2.5%	344	95	78.4%	47	9.7%	60	100	37.5%	326	67.1%	
Accounting (BBA)		5		100.0%			5		100.0%			5	1	83.3%			4		100.0%	1	20.0%	
Anthropology (BA)		1		100.0%			1		100.0%				1					1				
Anthropology (BS)		2	1	66.7%			2	1	66.7%	1	25.0%	2	1	66.7%	1	25.0%		1			3	75.0%
Aviation Sciences (BSA)		1		100.0%			1		100.0%			1		100.0%							1	100.0%
Baylor Business Fellows (BBA)		4		100.0%			4		100.0%			4		100.0%							4	100.0%
Biochemistry (BA)		1		100.0%						1	100.0%				1	100.0%					1	100.0%
Biochemistry (BS)			5	100.0%			6		100.0%			5	1	83.3%				2			3	60.0%
Bioinformatics (BSI)																						
Biology (BA)			1	100.0%																		
Biology (BS)			205	57	78.2%			197	58	77.3%	5	1.9%	174	59	74.7%	27	10.4%	18	64	22.0%	176	68.2%

Cohort Graduation Rate = $\text{Grad} / (\text{Enrolled} + \text{Left} + \text{Grad})$

$$326 / (60 + 100 + 326) = 67.1\%$$

EXAMPLES – GRADUATION RATES

Elapsed Terms Type	4			5			6			7			8									
	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate						
<input type="checkbox"/> First-Time Freshman		403	83	82.9%			385	89	81.2%	12	2.5%	344	95	78.4%	47	9.7%	60	100	37.5%	326	67.1%	
Accounting (BBA)		5		100.0%			5		100.0%			5	1	83.3%			1		100.0%	1	20.0%	
Anthropology (BA)		1		100.0%			1		100.0%				1					1				
Anthropology (BS)		2	1	66.7%			2	1	66.7%	1	25.0%	2	1	66.7%	1	25.0%		1			3	75.0%
Aviation Sciences (BSA)		1		100.0%			1		100.0%			1		100.0%							1	100.0%
Baylor Business Fellows (BBA)		4		100.0%			4		100.0%			4		100.0%							4	100.0%
Biochemistry (BA)		1		100.0%						1	100.0%				1	100.0%					1	100.0%
Biochemistry (BS)			5	100.0%			6		100.0%			5	1	83.3%				2			3	60.0%
Bioinformatics (BSI)																						
Biology (BA)			1	100.0%																		
Biology (BS)		205	57	78.2%			197	58	77.3%	5	1.9%	174	59	74.7%	27	10.4%	18	64	22.6%	176	68.2%	

Major Graduation Rate = Grad@major / (Enrolled + Left + Grad)@cohort

$$176 / (60 + 100 + 326) = 45.6\%$$

EXAMPLES – GRADUATION RATES

Elapsed Terms Type	4					5					6					7					8				
	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate	Enrolled	Left	Retention	Grad	Grad Rate				
<input type="checkbox"/> First-Time Freshman		403	83	82.9%			385	89	81.2%	12	2.5%	344	95	78.4%	47	9.7%	60	100	37.5%	326	67.1%				
Accounting (BBA)		5		100.0%			5		100.0%			5	1	83.3%			4		100.0%	1	20.0%				
Anthropology (BA)		1		100.0%			1		100.0%				1					1							
Anthropology (BS)		2	1	66.7%			2	1	66.7%	1	25.0%	2	1	66.7%	1	25.0%		1			3	75.0%			
Aviation Sciences (BSA)		1		100.0%			1		100.0%			1		100.0%							1	100.0%			
Baylor Business Fellows (BBA)		4		100.0%			4		100.0%			4		100.0%							4	100.0%			
Biochemistry (BA)		1		100.0%						1	100.0%				1	100.0%					1	100.0%			
Biochemistry (BS)		5		100.0%			6		100.0%			5	1	83.3%				2			3	60.0%			
Bioinformatics (BSI)																									
Biology (BA)		1		100.0%																					
Biology (BS)		205	57	78.2%			197	58	77.3%	5	1.9%	174	59	74.7%	27	10.4%	18	64	22.0%	176	68.2%				

Intra-Major Graduation Rate = Grad / (Enrolled + Left + Grad)

$$176 / (18 + 64 + 176) = 68.2\%$$

DATA STRUCTURE

ID	Entry Term	Entry Department	Term	Term Department	Enrolled	Gone	Graduated
6185933	Fall 2009	Business	Fall 2009	Business	1	.	.
6185933	Fall 2009	Business	Spring 2010	Business	1	.	.
6185933	Fall 2009	Business	Fall 2010	Business	1	.	.
6185933	Fall 2009	Business	Spring 2011	Business	1	.	.
6185933	Fall 2009	Business	Fall 2011	Business	1	.	.
6185933	Fall 2009	Business	Spring 2012	Marketing	1	.	.
6185933	Fall 2009	Business	Fall 2012	Marketing	1	.	.
6185933	Fall 2009	Business	Spring 2013	Marketing	1	.	.
6185933	Fall 2009	Business	Fall 2013	Marketing	1	.	.
6185933	Fall 2009	Business	Spring 2014	Marketing	.	.	1
6185933	Fall 2009	Business	Fall 2014	Marketing	.	.	1
6185933	Fall 2009	Business	Spring 2015	Marketing	.	.	1
6552468	Fall 2009	Biology	Fall 2009	Biology	1	.	.
6552468	Fall 2009	Biology	Spring 2010	HHPR	1	.	.
6552468	Fall 2009	Biology	Fall 2010	HHPR	1	.	.
6552468	Fall 2009	Biology	Spring 2011	HHPR	1	.	.
6552468	Fall 2009	Biology	Fall 2011	HHPR	.	1	.
6552468	Fall 2009	Biology	Spring 2012	HHPR	.	1	.

CREATE A CROSSTAB REPORT

- Filter by Entry Major and Entry Department
 - Term Department for rows
 - Terms as Columns
 - Sum of Enrolled, Gone, Graduated as measures
-

EXAMPLES

	Status after Four Years										
	Enrolled: Diff. Dept.			Enrolled: Same Dept.		Left Baylor		Graduated: Diff. Dept.		Graduated: Same Dept.	
	N	N	%	N	%	N	%	N	%	N	%
Entry Department											
Institute & Special Studies	8	2	25.00	.	.	3	37.50	.	.	3	37.50
Institute for Air Science	22	1	4.55	3	13.64	8	36.36	5	22.73	5	22.73
Journalism/Public Rel/New Media	178	7	3.93	9	5.06	40	22.47	59	33.15	63	35.39
Latin American Studies	1	1	100.00	.	.	.	.	.	.	.	.
Mathematics	73	6	8.22	3	4.11	26	35.62	18	24.66	20	27.40
Modern Foreign Language	51	3	5.88	2	3.92	12	23.53	20	39.22	14	27.45
Museum Studies	5	.	.	.	.	1	20.00	3	60.00	1	20.00
Music	354	19	5.37	92	25.99	86	24.29	26	7.34	131	37.01
Nursing	392	29	7.40	41	10.46	143	36.48	54	13.78	125	31.89
Philosophy	42	7	16.67	2	4.76	12	28.57	11	26.19	10	23.81
Physics	38	5	13.16	2	5.26	8	21.05	14	36.84	9	23.68
Political Science	408	23	5.64	14	3.43	87	21.32	93	22.79	191	46.81
Psychology & Neuroscience	716	66	9.22	47	6.56	227	31.70	160	22.35	216	30.17
Religion	64	7	10.94	2	3.13	13	20.31	18	28.13	24	37.50
School of Social Work	59	3	5.08	2	3.39	15	25.42	9	15.25	30	50.85
Slavic Studies	2	.	.	.	.	.	.	1	50.00	1	50.00
Sociology	23	4	17.39	.	.	8	34.78	6	26.09	5	21.74
Statistical Sciences	5	1	20.00	.	.	1	20.00	3	60.00	.	.
Theater Arts	113	3	2.65	5	4.42	18	15.93	13	11.50	74	65.49
Undeclared Department	1069	182	17.03	1	0.09	286	26.75	600	56.13	.	.
University Scholars	175	11	6.29	4	2.29	20	11.43	40	22.86	100	57.14
All	11675	1152	9.87	995	8.52	3077	26.36	2694	23.07	3757	32.18

“TAKE AWAYS”

- There is no single “right” answer
- Be consistent
 - Establish a cohort

QUESTIONS OR COMMENTS

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