

# Visualizing Assessment Data with Tableau

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University of Houston, Office of Institutional Research

Summer Assessment Symposium

University of Houston

June 20, 2018

# Outcomes

- Understand the value of using data visualization to present data
- Identify ways that Tableau can be used to present assessment data within your organization
- Cite three best practices for building Tableau visualizations



# Excel vs. Data Visualization Tools

Excel	Data Visualization Tools
Primarily static charts	Flexible charts
Dashboards are complicated	Dashboards are drag and drop
Constraints on dataset size and efficiency	Ability to analyze large datasets with speed and ease
Maps? What are maps?	Mapping capability
Without lots of programming, product is static (usually printed)	Explore data in real-time

# Excel Document

As of April 09, 2017  
Day 03 of the Fall Enrollment Cycle

## New and Continuing Student Enrollment (Session 1 Only)

Headcount Student Level	New				Continuing				Total			
	Fall 2015	Fall 2016	Fall 2017	2015-17 % Diff	Fall 2015	Fall 2016	Fall 2017	2015-17 % Diff	Fall 2015	Fall 2016	Fall 2017	2015-17 % Diff
UGRD - FTIC	0	0	0	#DIV/0!	2,632	3,832	5,120	94.5%	2,632	3,832	5,120	94.5%
UGRD - Transfer	0	0	0	#DIV/0!	550	629	777	41.3%	550	629	777	41.3%
All Undergraduate	0	0	0	#DIV/0!	3,182	4,461	5,897	85.3%	3,182	4,461	5,897	85.3%
Post-Bacc	0	0	3	#DIV/0!	2	2	3	50.0%	2	2	6	200.0%
Masters	18	14	0	-100.0%	703	656	866	23.2%	721	670	866	20.1%
Doctoral	1	0	0	-100.0%	97	54	95	-2.1%	98	54	95	-3.1%
All Graduate	19	14	0	-100.0%	800	710	961	20.1%	819	724	961	17.3%
Law	0	0	0	#DIV/0!	22	24	43	95.5%	22	24	43	95.5%
Optometry	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Pharmacy	3	3	0	-100.0%	74	8	72	-2.7%	77	11	72	-6.5%
All Special Prof.	3	3	0	-100.0%	96	32	115	19.8%	99	35	115	16.2%
<b>Total</b>	22	17	3	-86.4%	4,080	5,205	6,976	71.0%	4,102	5,222	6,979	70.1%

SCH Student Level	New				Continuing				Total			
	Fall 2015	Fall 2016	Fall 2017	2015-17 % Diff	Fall 2015	Fall 2016	Fall 2017	2015-17 % Diff	Fall 2015	Fall 2016	Fall 2017	2015-17 % Diff
UGRD - FTIC	0	0	0	#DIV/0!	35,825	53,190	71,261	98.9%	35,825	53,190	71,261	98.9%
UGRD - Transfer	0	0	0	#DIV/0!	6,448	7,238	9,084	40.9%	6,448	7,238	9,084	40.9%
All Undergraduate	0	0	0	#DIV/0!	42,273	60,428	80,345	90.1%	42,273	60,428	80,345	90.1%
Post-Bacc	0	0	0	#DIV/0!	6	6	18	200.0%	6	6	18	200.0%
Masters	161	132	0	-100.0%	6,314	5,450	7,208	14.2%	6,474	5,582	7,208	11.3%
Doctoral	9	0	0	-100.0%	748	394	704	-5.9%	757	394	704	-7.0%
All Graduate	170	132	0	-100.0%	7,062	5,844	7,912	12.0%	7,231	5,976	7,912	9.4%
Law	0	0	0	#DIV/0!	281	329	545	94.0%	281	329	545	94.0%
Optometry	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Pharmacy	39	42	0	-100.0%	984	98	1,012	2.8%	1,023	140	1,012	-1.1%
All Special Prof.	39	42	0	-100.0%	1,265	427	1,557	23.1%	1,304	469	1,557	19.4%
<b>Total</b>	209	174	0		50,606	66,705	89,832	77.5%	50,814	66,879	89,832	76.8%

# Tableau Version

## New and Continuing Student Fall Enrollment (Headcount)

As of May 21, 2017

		<u>New</u>			<u>Continuing</u>			<u>Total</u>		
		2016	2017	% Change	2016	2017	% Change	2016	2017	% Change
Undergraduate	FTIC	281	303	7.8%	9,322	9,904	6.2%	9,603	10,207	6.3%
	Transfer	24	25	4.2%	10,346	11,303	9.2%	10,370	11,328	9.2%
	<b>Total</b>	<b>305</b>	<b>328</b>	<b>7.5%</b>	<b>19,668</b>	<b>21,207</b>	<b>7.8%</b>	<b>19,973</b>	<b>21,535</b>	<b>7.8%</b>
Post-Bacc	Post-Bacc	41	32	-22.0%	647	656	1.4%	688	688	0.0%
	<b>Total</b>	<b>41</b>	<b>32</b>	<b>-22.0%</b>	<b>647</b>	<b>656</b>	<b>1.4%</b>	<b>688</b>	<b>688</b>	<b>0.0%</b>
Graduate	Master's	102	194	90.2%	1,573	1,742	10.7%	1,675	1,936	15.6%
	Doctoral	33	76	130.3%	445	653	46.7%	478	729	52.5%
	<b>Total</b>	<b>135</b>	<b>270</b>	<b>100.0%</b>	<b>2,018</b>	<b>2,395</b>	<b>18.7%</b>	<b>2,153</b>	<b>2,665</b>	<b>23.8%</b>
Special Prof.	Law	13	38	192.3%	469	486	3.6%	482	524	8.7%
	Optometry		5			1			6	
	Pharmacy	117	102	-12.8%	222	234	5.4%	339	336	-0.9%
	<b>Total</b>	<b>130</b>	<b>145</b>	<b>11.5%</b>	<b>691</b>	<b>721</b>	<b>4.3%</b>	<b>821</b>	<b>866</b>	<b>5.5%</b>
<b>Grand Total</b>		<b>611</b>	<b>775</b>	<b>26.8%</b>	<b>23,024</b>	<b>24,979</b>	<b>8.5%</b>	<b>23,635</b>	<b>25,754</b>	<b>9.0%</b>

Select View  
Headcount

Select Semester  
Fall

Number of Years  
Two Years

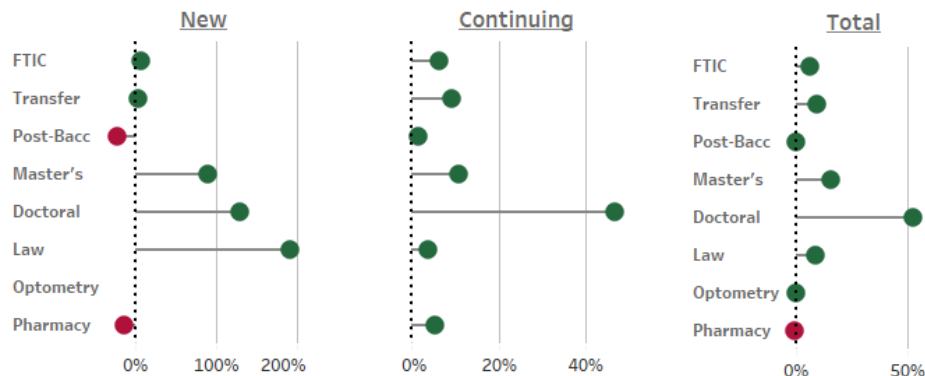
Select a Week  
Most Recent Week

Select a Sunday  
5/21/2017

College  
(All)

Department  
(All)

## Overall Percent Change



Semester: Fall  
Alignment: As of May 21, 2017  
College: All  
Department: All



# Why Use a Visual Tool

- Find patterns and relationships in data
- Meet the needs of the audience
- Make sure the real “story” doesn’t get lost in the data

### Campus Environment: First-year students

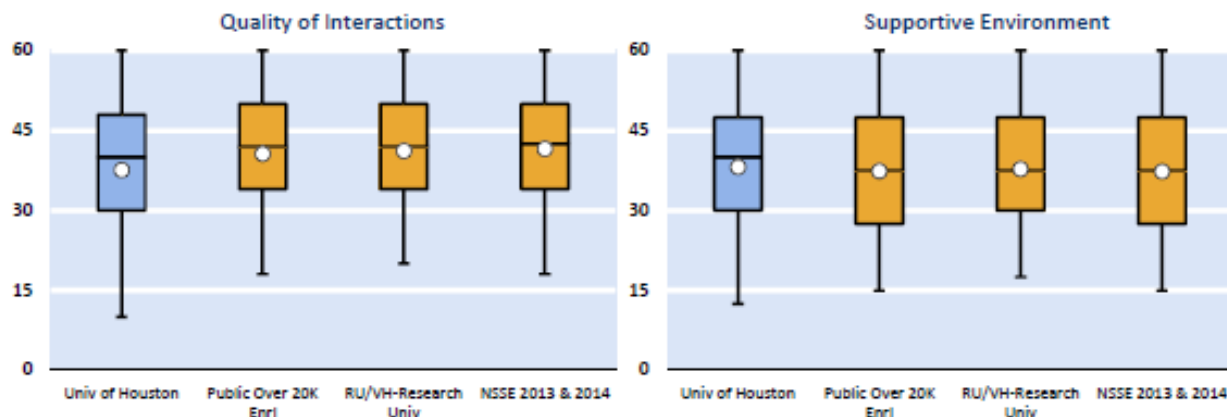
Students benefit and are more satisfied in supportive settings that cultivate positive relationships among students, faculty, and staff. Two Engagement Indicators investigate this theme: *Quality of Interactions* and *Supportive Environment*. Below are three views of your results alongside those of your comparison groups.

#### Mean Comparisons

Engagement Indicator	Univ of Houston Mean	Your first-year students compared with					
		Public Over 20K Enrl		RU/VH-Research Univ		NSSE 2013 & 2014	
		Mean	Effect size	Mean	Effect size	Mean	Effect size
Quality of Interactions	37.6	40.6 **	-.24	41.2 ***	-.31	41.5 ***	-.32
Supportive Environment	38.2	37.4	.06	37.8	.03	37.3	.06

Notes: Results weighted by institution-reported sex and enrollment status (and institution size for comparison groups); \*p<.05, \*\*p<.01, \*\*\*p<.001 (2-tailed); Effect size: Mean difference divided by pooled standard deviation; Symbols on the Overview page are based on effect size and p before rounding.

#### Score Distributions



Notes: Each box-and-whiskers chart plots the 5th (bottom of lower bar), 25th (bottom of box), 50th (middle line), 75th (top of box), and 95th (top of upper bar) percentile scores. The dot represents the mean score. Refer to Detailed Statistics for your institution's sample sizes.

#### Summary of Indicator Items

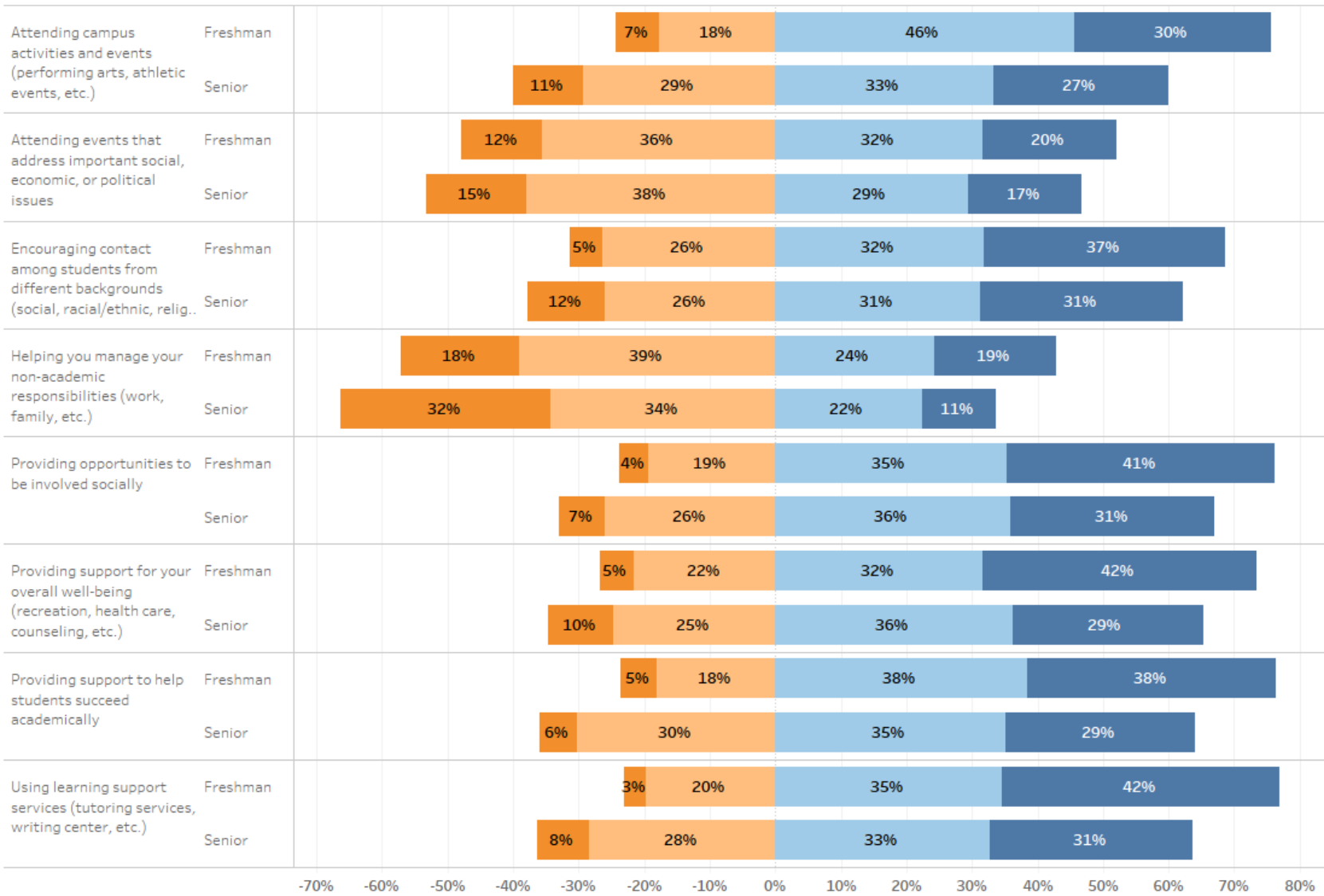
##### Quality of Interactions

Percentage rating a 6 or 7 on a scale from 1="Poor" to 7="Excellent" their interactions with...

	Univ of Houston	Public Over 20K Enrl	RU/VH-Research Univ	NSSE 2013 & 2014
13a. Students	57	58	61	59
13b. Academic advisors	38	46	47	48
13c. Faculty	45	45	45	50
13d. Student services staff (career services, student activities, housing, etc.)	30	42	42	44
13e. Other administrative staff and offices (registrar, financial aid, etc.)	28	37	37	41

##### Supportive Environment

# NSSE Engagement Indicators



Answers

- Very little
- Some
- Quite a bit
- Very much

Display

All Answers

Comparison Groups

Classification



## STUDENT EVALUATION OF INSTRUCTION

E=Excellent; VG=Very Good; G=Good; F=Fair; P=Poor; VP=Very Poor

### PERCENTAGES <sup>1</sup>

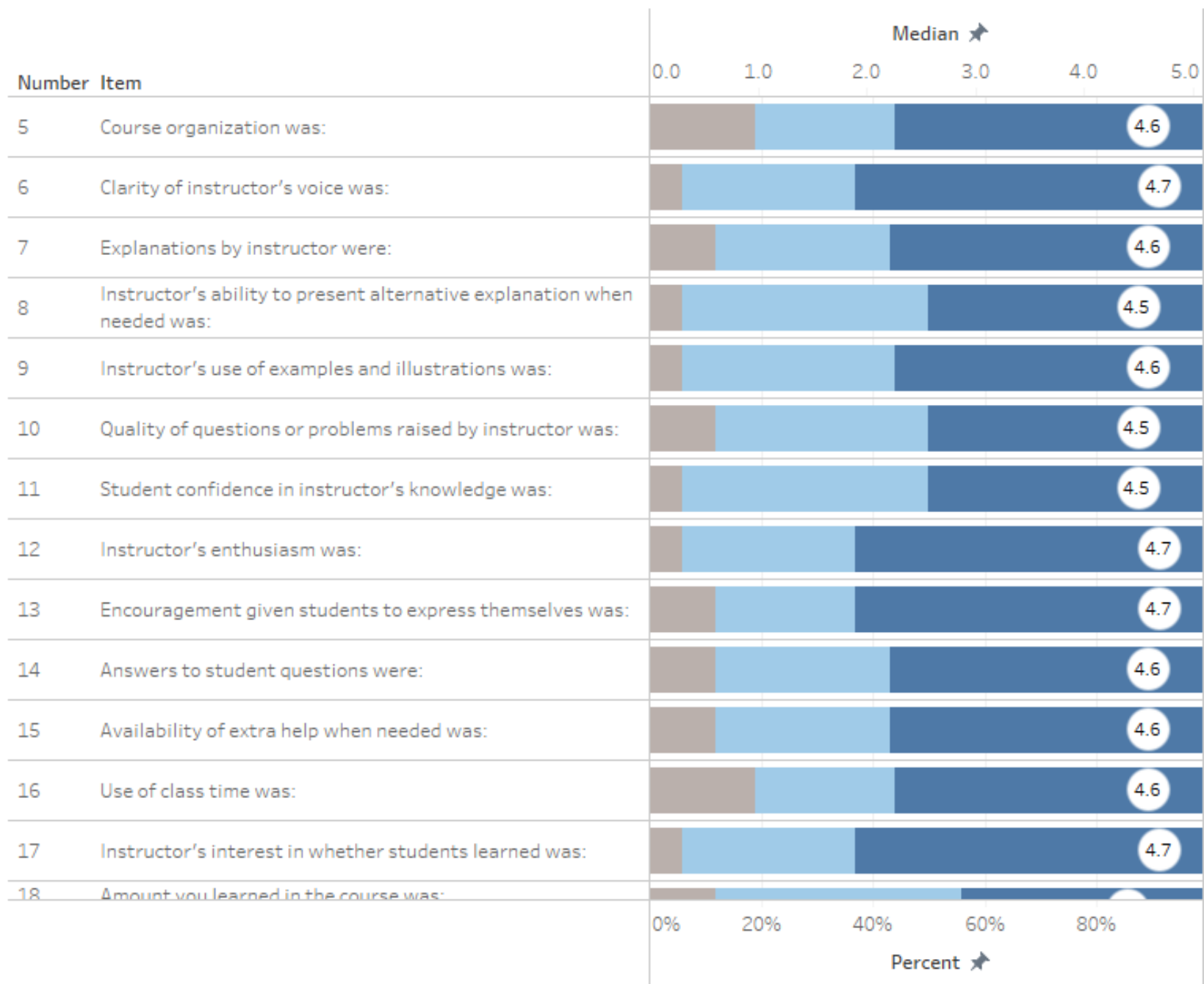
	Respondents	PERCENTAGES <sup>1</sup>					MEDIAN	Adjusted Median
		E (5)	VG (4)	G (3)	F (2)	P (1)		
1. The course as a whole was:	16	56	31	12			4.6	4.5
2. The course content was:	16	62	12	25			4.7	4.5
3. The instructor's contribution to the course was:	16	69	25	6			4.8	4.7
4. The instructor's effectiveness in teaching the subj. matter was:	16	56	38	6			4.6	4.5
<b>COMBINED ITEMS 1-4</b>	<b>64</b>	<b>61</b>	<b>27</b>	<b>12</b>			<b>4.7</b>	<b>4.5</b>
								<b>Relative Rank</b>
5. Course organization was:	16	56	25	19			4.6	2
6. Clarity of instructor's voice was:	16	62	31	6			4.7	14
7. Explanations by instructor were:	16	56	31	12			4.6	5
8. Instr's ability to present alternative explan. when needed was:	16	50	44	6			4.5	12
9. Instructor's use of examples and illustrations was:	16	56	38	6			4.6	11
10. Quality of questions or problems raised by instructor was:	16	50	38	12			4.5	13
11. Student confidence in instructor's knowledge was:	16	50	44	6			4.5	18
12. Instructor's enthusiasm was:	16	62	31	6			4.7	15
13. Encouragement given students to express themselves was:	16	62	25	12			4.7	10
14. Answers to student questions were:	16	56	31	12			4.6	8
15. Availability of extra help when needed was:	16	56	31	12			4.6	9
16. Use of class time was:	16	56	25	19			4.6	3
17. Instructor's interest in whether students learned was:	16	62	31	6			4.7	6
18. Amount you learned in the course was:	16	44	44	12			4.4	16
19. Relevance and usefulness of course content were:	16	69	19	12			4.8	1
20. Evaluative and grading techniques (tests, papers, etc.) were:	16	50	31	19			4.5	7
21. Reasonableness of assigned work was:	16	56	19	19	6		4.6	4
22. Clarity of student responsibilities and requirements was:	16	44	44	12			4.4	17

Much Higher      Average      Much Lower  
(7) (6) (5) (4) (3) (2) (1)

### Relative to other college courses you have taken:

23. Do you expect your grade in this course to be:	16	19	25	25	25	6		5.3
24. The intellectual challenge presented was:	16	19	25	19	38			5.2
25. The amount of effort you put into this course was:	15	20	13	33	27	7		5.0
26. The amount of effort to succeed in this course was:	15	13	20	40	27			5.1
27. Your involvement in course (assignments, attendance, etc.) was:	16	19	25	25	31			5.3

# Itemized Assessment



# Presenting Tableau Dashboards

- Tableau Server versus Tableau Public
- Best practices for designing dashboards
  - Knowing your audience
  - Performance
  - Dashboard layout/views
  - Data structure (long/wide)

# UH by the Numbers

- Home
- Enrollment Tracking
- Enrollment Trends
- New Student Profile
- Semester Credit Hours
- Student Degrees
- Faculty

UH Home > UH By the Numbers > Enrollment Trends

## Enrollment Trends

**NOTE:** The data contained on this website is available for University of Houston faculty and staff only. A valid CougarNet ID and password is required to log in and view this data. For publicly available institutional data, please visit the Institutional Research website at <http://www.uh.edu/ir/>.

*For Internet Explorer 11 users:* This site is not supported. Please view using the Firefox or Chrome browsers.

- At a Glance
- Race/Ethnicity
- Gender
- Student Level
- Custom Tables

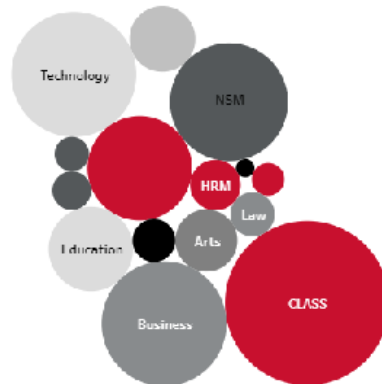
Semester: Fall 2017

### Total Enrollment

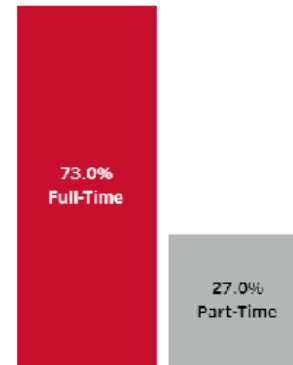
# 45,364

Undergraduate	36,088
Postbaccalaureate	1,246
Master's	4,174
Doctoral	2,249
Special Prof	1,607

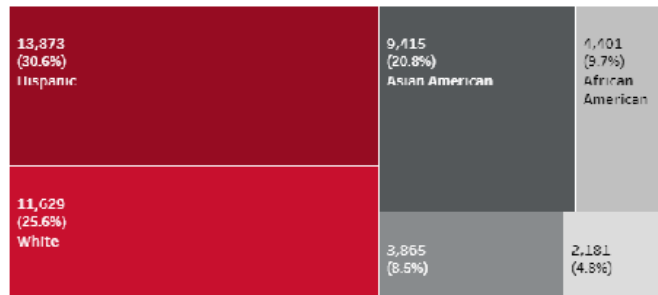
### Enrollment by College



### Full-Time/Part-Time Status



### Race/Ethnicity



### Gender



# UH by the Numbers

ENROLLMENT TRACKING

Admissions

Class Profiles

Admit and Yield Rates

New and Continuing Student Enrollment

## Admissions

**NOTE:** The data contained on this website is available for University of Houston faculty and staff only. A valid CougarNet ID and password is required to log in and view this data. For publicly available institutional data, please visit the Institutional Research website at <http://www.uh.edu/ir/>.

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### Student Applicants, Admissions, and Enrollment

As of Jan 28, 2018

		Applicants				One Year Change				Select Semester		
		Started	Completed	Completion Rate	Admitted	Admit Rate	Enrolled	Yield Rate	Started		Completed	Admitted
FTIC	Spring 2017	649	300	46.2%	162	54.0%	99	61.1%				
	Spring 2018	610	256	42.0%	150	58.6%	91	60.7%	-6.0%	-14.7%	-7.4%	-8.1%
Transfer	Spring 2017	4,546	3,427	75.4%	2,891	84.4%	2,105	72.8%				
	Spring 2018	4,212	3,296	78.3%	2,913	88.4%	1,983	68.1%	-7.3%	-3.8%	0.8%	-5.8%
Post-Bacc	Spring 2017	547	442	80.8%	419	94.8%	271	64.7%				
	Spring 2018	513	418	81.5%	396	94.7%	239	60.4%	-6.2%	-5.4%	-5.5%	-11.8%
Readmitted	Spring 2017	997	765	76.7%	499	65.2%	387	77.6%				
	Spring 2018	854	622	72.8%	388	62.4%	303	78.1%	-14.3%	-18.7%	-22.2%	-21.7%
Master's	Spring 2017	1,192	1,016	85.2%	779	76.7%	590	75.7%				
	Spring 2018	852	708	83.1%	540	76.3%	370	68.5%	-28.5%	-30.3%	-30.7%	-37.3%
Doctoral	Spring 2017	207	197	95.2%	105	53.3%	92	87.6%				
	Spring 2018	144	120	83.3%	87	72.5%	68	78.2%	-30.4%	-39.1%	-17.1%	-26.1%
Special Prof.	Spring 2017	23	23	100.0%	23	100.0%	22	95.7%				
	Spring 2018	16	16	100.0%	16	100.0%	14	87.5%	-30.4%	-30.4%	-30.4%	-36.4%

Select Semester  
Spring

Start Year  
2017

End Year  
2018

Select a Week  
Most Recent Week

Select a Sunday  
11/5/2017

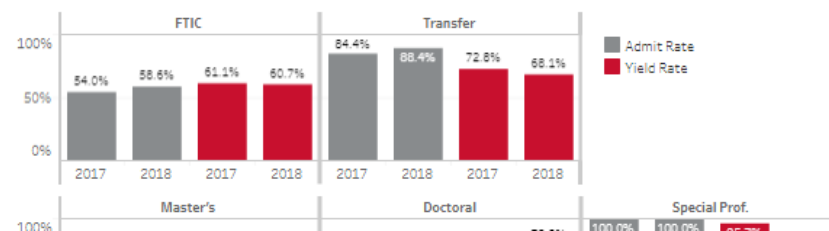
College  
(All)

Department  
(All)



Semester: Spring  
Date: As of Jan 28, 2018  
College: All  
Department: All

#### Admit and Yield Rates



# Colors

- Colors as a data point
- Different color schemes
  - Categorical/Qualitative
  - Sequential
  - Diverging






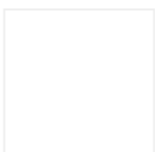
# Qualitative

- Discrete categories of data with no order (gender, race/ethnicity, student level)












## Primary Brand Colors

	<b>RED</b> R:200 G:16 B:46 PMS: 186 C C:0 M:100 Y:81 K:4 HEX: C8102E
	<b>TEAL</b> R:0 G:179 B:136 PMS: 339 C C:84 M:0 Y:59 K:0 HEX: 00B388
	<b>GOLD</b> R:246 G:190 B:0 PMS: 7408 C C:0 M:29 Y:100 K:0 HEX: F6BE00
	<b>GRAY</b> R:136 G:139 B:141 PMS: COOL GRAY 8 C C:26 M:16 Y:13 K:46 HEX: 888B8D
	<b>CREAM</b> R:255 G:249 B:217 PMS: 7499 C C:1 M:2 Y:24 K:0 HEX: FFF9D9
	<b>WHITE</b> R:255 G:255 B:255 PMS: WHITE C:0 M:0 Y:0 K:0 HEX: FFFFFFFF

## Secondary Brand Colors

	<b>BRICK</b> R:150 G:12 B:34 PMS: 704 C C:8 M:97 Y:76 K:31 HEX: 960C22
	<b>GREEN</b> R:0 G:134 B:108 PMS: 328 C C:100 M:10 Y:61 K:38 HEX: 00866C
	<b>MUSTARD</b> R:216 G:155 B:0 PMS: 124 C C:10 M:30 Y:100 K:0 HEX: D89B00
	<b>SLATE</b> R:84 G:88 B:90 PMS: 425 C C:45 M:29 Y:26 K:76 HEX: 54585A

## Tertiary Brand Colors

	<b>CHOCOLATE</b> R:100 G:8 B:23 PMS: 490 C C:26 M:85 Y:85 K:72 HEX: 640817
	<b>FOREST</b> R:0 G:89 B:80 PMS: 3305 C C:95 M:25 Y:70 K:68 HEX: 005950
	<b>OCHER</b> R:185 G:120 B:0 PMS: 1245 C C:9 M:35 Y:98 K:30 HEX: B97800
	<b>BLACK</b> R:0 G:0 B:0 PMS: BLACK C:0 M:0 Y:0 K:100 HEX: 000000



# Sequential

- Gradients of colors used to show a sequence between higher and lower values (rain intensity)



# Diverging

- Large low values that diminish and lead to large high values, negative to positive values (likert scales)

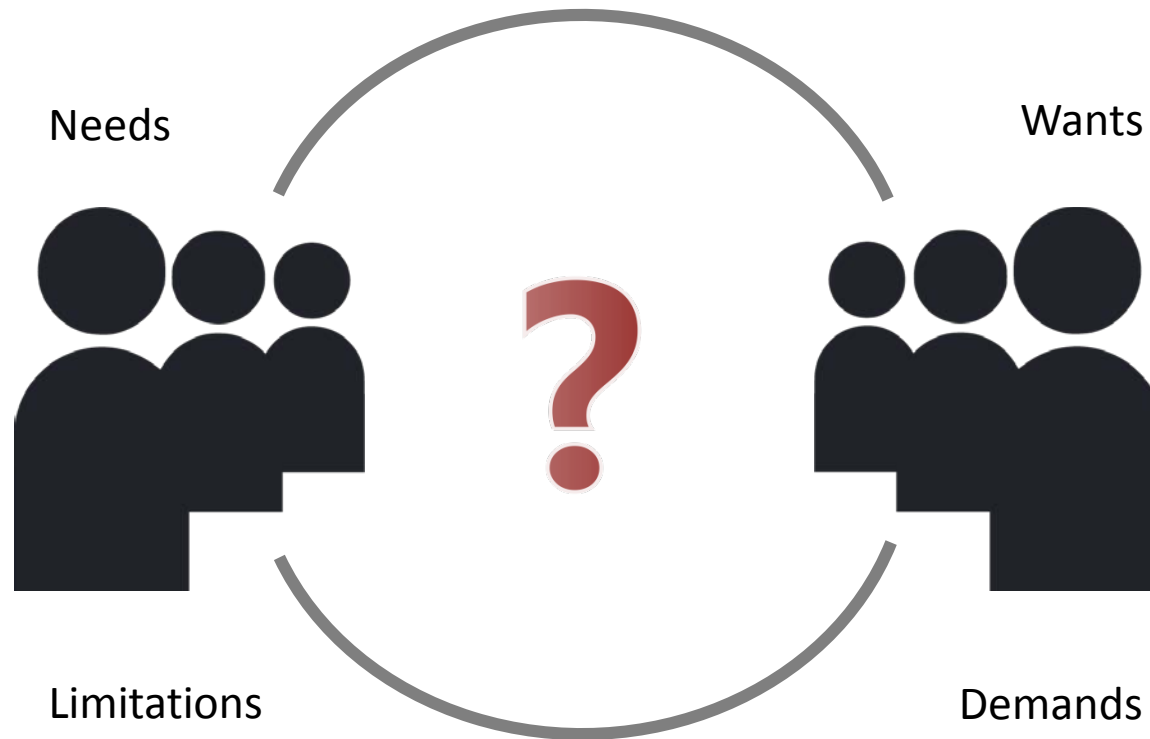


# Managing Expectations



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# The Great Balancing Act





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# Resources

- [Tableau Best Practices](#)
- [Color Schemes](#)
- [Visualizing Assessment Data](#)
- [Data Revelations](#)
- [Visualizing Survey Data](#)
- [VizWiz](#)
- [Tableau Community](#)
- [Tableau Gallery](#)