

# Using Power BI Visualizations for General Education Curriculum Assessment

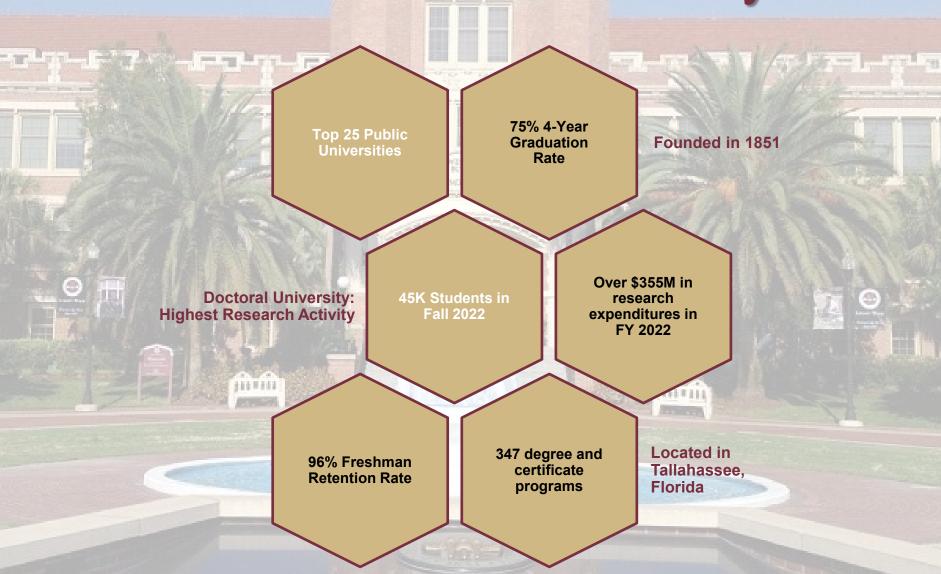
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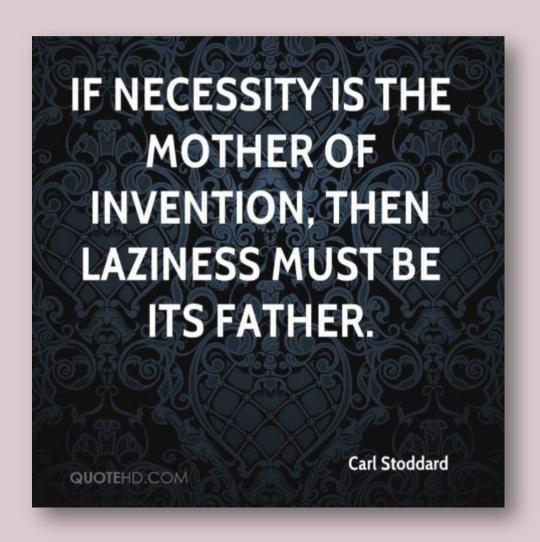
Galiya Tabulda, Ph.D.

Director, Office of Institutional Performance and Assessment

## Florida State University



### **Motivation**



Our goal was to generate larger amount of more reliable and valid learning outcomes data while decreasing the total amount of faculty/staff time spent on collecting and aggregating those data

### Background:

### **Student Learning Outcomes in General Education Curriculum**

University-Level Proficiency	General Education Area	Student Learning Outcomes (SLOs)
Written Communication	English	SLO #1: Compose for a specific purpose, occasion, and audience. SLO #2: Compose in a process, including drafts, revision, and editing. SLO #3: Incorporate sources from a variety of text types. SLO #4: Convey ideas clearly, coherently, and effectively, utilizing the conventions of standard American English where relevant.
Problem Solving	Quantitative and Logical Thinking	SLO #5: Select & apply appropriate methods (i.e., mathematical, statistical, logical, &/or computational models or principles) to solve real-world problems.  SLO #6: Use a variety of forms to represent problems & their solutions.
for Real World Application	Natural Science	SLO #7: Pose questions or hypotheses based on scientific principles. SLO #8: Use appropriate scientific methods and evidence to evaluate claims or theoretical arguments about the natural world. SLO #9: Analyze and interpret research results using appropriate methods.
	Ethics	SLO #10: Evaluate various ethical positions. SLO #11: Describe the ways in which historical, social, or cultural contexts shape ethical perspectives.
Higher Order Thinking	History	SLO #12: Discuss the role of historical factors in contemporary problems or personal experiences. SLO #13: Analyze claims about historical phenomena.
	Humanities	SLO #14: Interpret intellectual or artistic works within a cultural context.  SLO #15: Use a cultural, artistic, or philosophical approach to analyze some aspect of human experience.
	Social Science	SLO #16: Discuss the role of social factors in contemporary problems or personal experiences. SLO #17: Analyze claims about social phenomena.

### Methodology:

#### 3-Strata Approach Based on the Pareto Principle

#### **Top Stratum**:

31 courses accounting for 66% of TLH F2F enrollment in Fall 2020, 2021 and 2022

All 31 courses were included in assessment

#### **Middle Stratum**:

209 courses accounting for 33% of TLH F2F enrollment in Fall 2020, 2021 and 2022

43 courses were included in assessment

#### **Bottom Stratum:**

183 courses with no TLH F2F enrollment in Fall 2020, 2021 and 2022

9 courses were included in assessment

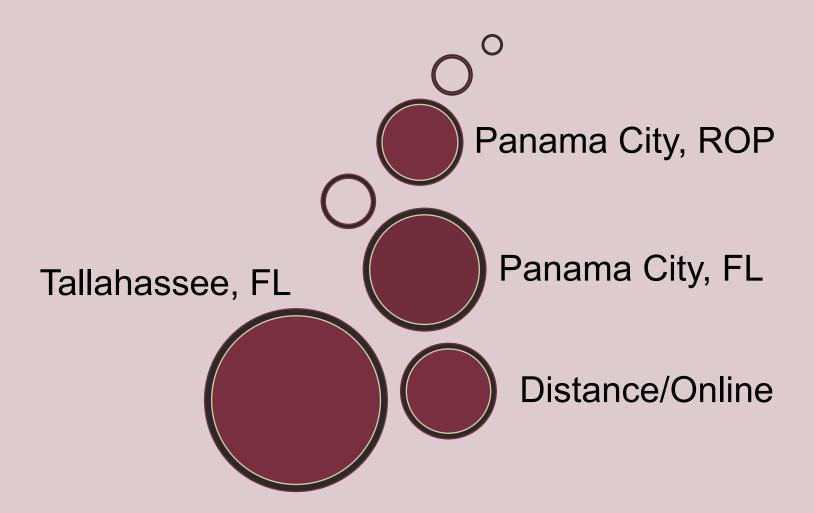
### Top Stratum = 66%

Gen Ed Area	Gen Ed Course	Gen Ed Course Name	Assessment Cycle	Avg # Sections 2020-22	Avg Total Enrollment 2020-22	Average % of Total Gen Ed Enrollments 2020-22
English Composition	ENC2135	Research, Genre, and Context	Fall 2021	124	2,339	6.11%
Natural Science	BSC2010	Biological Science I	Fall 2020	22	1,545	4.04%
Natural Science	CHM1045	General Chemistry I	Fall 2021	59	1,423	3.72%
Ethics	PHI2010	Introduction to Philosophy	Fall 2020	19	1,412	3.69%
Quantitative and Logical Thinking	MAC1105	College Algebra	Fall 2022	53	1,304	3.41%
Natural Science	PSB2000	Introduction to Brain and Behavior	Fall 2020	15	1,138	2.97%
Social Science	ECO2013	Principles of Macroeconomics	Fall 2021	8	1,082	2.83%
Social Science	ECO2023	Principles of Microeconomics	Fall 2021	9	1,044	2.73%
Quantitative and Logical Thinking	MAC2311	Calculus with Analytic Geometry I	Fall 2022	32	1,004	2.62%
Social Science	PSY2012	General Psychology	Fall 2020	9	944	2.47%
English Composition	ENC1101	Freshman Composition and Rhetoric	Fall 2020	49	933	2.44%
Natural Science	BSC1005	General Biology for Nonmajors	Fall 2020	3	907	2.37%
Quantitative and Logical Thinking	STA2122	Introduction to Applied Statistics	Fall 2021	31	868	2.27%
Quantitative and Logical Thinking	STA2023	Fundamental Business Statistics	Fall 2021	20	861	2.25%
Quantitative and Logical Thinking	MAC1140	Precalculus Algebra/Trigonometry	Fall 2022	46	808	2.11%
Quantitative and Logical Thinking	MAC1114	Analytic Trigonometry	Fall 2022	27	674	1.76%
Natural Science	PHY2053C	College Physics A	Fall 2021	17	632	1.65%
Natural Science	BSC2011	Biological Science II	Fall 2020	3	619	1.62%
Quantitative and Logical Thinking	MAC2233	Calculus for Business	Fall 2022	24	618	1.61%
Humanities and Cultural Practice	CLT3378	Ancient Mythology, East and West	Fall 2021	9	607	1.59%
Natural Science	CHM1046	General Chemistry II	Fall 2021	22	543	1.42%
Humanities and Cultural Practice	REL1300	Introduction to World Religions	Fall 2022	13	506	1.32%
Natural Science	EVR1001	Introduction to Environmental Science	Fall 2022	2	481	1.26%
Natural Science	BSC2085	Anatomy and Physiology I	Fall 2020	1	458	1.20%
History	AMH2097	The History of Immigration to the United States	Fall 2020	6	405	1.06%
Natural Science	AST1002	Planets, Stars, and Galaxies	Fall 2022	3	392	1.02%
Ethics	PHI2630	Ethical Issues and Life Choices	Fall 2020	13	382	1.00%
Humanities and Cultural Practice	MUH2019	Modern Popular Music	Fall 2020	5	357	0.93%
Natural Science	PHY2048C	General Physics A	Fall 2021	10	350	0.91%
Quantitative and Logical Thinking	MAC2312	Calculus with Analytic Geometry II	Fall 2022	19	350	0.91%
Social Science	SYG1000	Introductory Sociology	Fall 2021	6	349	0.91%

### 3-Year Cycle

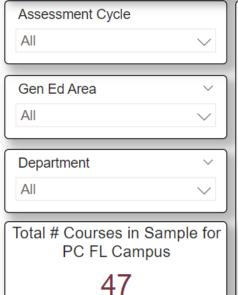
Gen Ed Area	Gen Ed Area	Fall 1 (Fall 2020*, Fall 2023, Fall 2026)	Fall 2 (Fall 2021, Fall 2024, Fall 2027)	Fall 3 (Fall 2022, Fall 2025, Fall 2028)
Written Communication	English	ENC1101	ENC2135	
Problem Solving for Real World Application	Quantitative and Logical Thinking	PHI2100	STA2122, STA1013, STA2171, STA 2023	MAC2233, MAC1114, MAC2311, MGF1106, MAC1105, MAC1140, MAC2312, MAC2313
Problem Solving for Real World Application	Natural Science	BSC2010, BSC1005, BSC2011, BSC2085, IDS2134, PSB2000, CJE3762, CJE3652	CHM1045, CHM1046, CHM1020C, PHY2053C, PHY2048C, PHY2049C, PHY1020	EVR1001, HUN1201, AST1002, MET1010, ESC1000, GLY2010C, OCE1001
Higher Order Thinking	Ethics	PHI2010, PHI2630, PHI2635	PAD3003, CIS3250	REL3170, REL3171, REL3152
Higher Order Thinking	History	AMH2097, AMH2020, HIS3464	CLA2123, CLA2110, CLT2049	REL2121
Higher Order Thinking	Humanities	MUL2010, MUH2019, MUH2051, ARH2000	CLT3378, CLT3370, THE2000, FIL2001	REL1300, REL2240, REL2210, HUM3321, HUM2020
Higher Order Thinking	Social Science	PSY2012, POS1041, CPO2002, ANT2416, ANT2000, ANT2410	ECO2023, ECO2013, ECO2000, SYG1000, SYG2010, SYO3100,	FAD2230, GEA1000, GEO1400, GEO1330, CCJ3011, CCJ2020

# Background: Locations/Modalities



### 3-Year Cycle

#### **Assessment Sample by Location & Modality**



Total # Courses in Sample for PC ROP Campus

61

Total # Courses in Sample for Tallahassee Campus

83

Department	Course	TLH F2F	TLH Online	PC FL F2F	PC FL Online	PC ROP F2F	PC ROP Online
Anthropology	ANT2000	X					
Anthropology	ANT2410		X		X		
Anthropology	ANT2416	X					
Art	ART2003C						
Art	IDS3167				X		
Art	IDS3169				X		
Art History	ARH2000		X		X		X
Biology	BSC1005	X		X		X	
Biology	BSC2010	X		X		X	
Biology	BSC2011	X					
Biology	BSC2085	X					
Biology	IDS2134		X				
Chemistry	CHM1020C		X		X		X
Chemistry	CHM1045	X		X		Χ	
Chemistry	CHM1046	X					
Classics	CLA2110	X					
Classics	CLA2123	X					
Classics	CLT2049		X				
Classics	CLT3370	X					
Classics	CLT3378	X					
Classics	HUM3321	X	X				

### **Working with Departments**

Mid-Spring

Orientation meeting for Departments participating in assessment in upcoming Fall

Late Summer

Best Practices
Workshop for
participating
Departments

Early Fall

Collecting
SLOAssignment
information
using fillable
templates

# ALIGN SLOs WITH ASSIGNMENTS: 1-to-1 Alignment

SLO #9: Pose questions or hypotheses based on scientific principles

Midterm Exam SLO #3: Discuss the role of social factors in contemporary problems or personal experiences

Quiz 4

SLO #6: Analyze claims about social phenomena

Homework 6

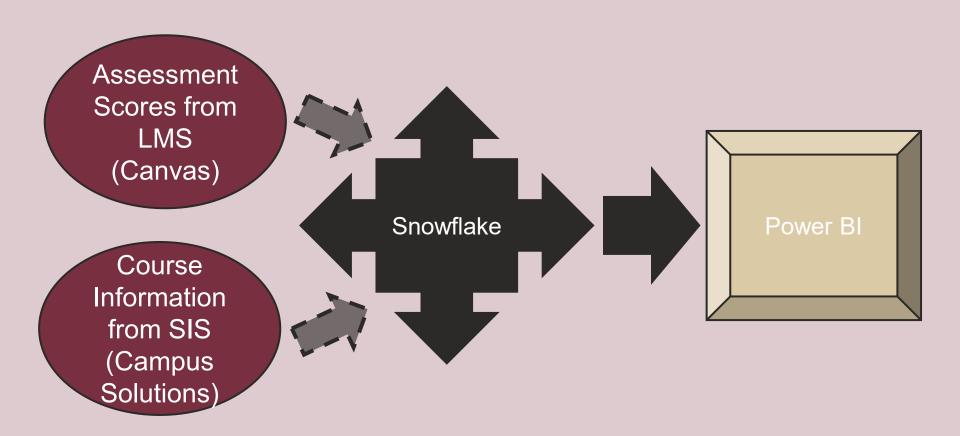
### **SLO-Assignment Template**

	Gen Ed Classifications & Assessment Information	COMPLETE THE COLUMNS BELOW			
Course Section	Student Learning Outcome (SLO)	Number of assignments used to assess this SLO? 1, 2, 3 or More than 3? (Best Practice is to use 1 assignment per SLO)	If using Canvas Grade Book, provide each Distinctly Named Assignment used to assess this SLO. Please list exact name(s) from the Canvas Grade Book for each section.	If only part of an assignment is used to assess SLO (e.g., questions embedded in a larger final exam), will you create a non-weighted assignment in the Canvas grade book for it? If yes, provide the distinct assignment name it will be assigned.	
	SLO #1: Pose questions or hypotheses based on scientific principles.	1	Quiz 1	N/A	
0001	SLO #2: Use appropriate scientific methods and evidence to evaluate claims or theoretical arguments about the natural world.	1	Midterm	N/A	
	SLO #3: Analyze and interpret research results using appropriate methods.	1	Discussion Board Post on Methods	N/A	
	SLO #1: Pose questions or hypotheses based on scientific principles.	1	LS Assignment 1	One multipart question on the "Final Exam" is entered in the Gradebook as "LS Assignment 1"	
0002	SLO #2: Use appropriate scientific methods and evidence to evaluate claims or theoretical arguments about the natural world.	1	LS Assignment 2	One multipart question on the "Final Exam" is entered in the Gradebook as "LS Assignment 2"	
	SLO #3: Analyze and interpret research results using appropriate methods.	1	LS Assignment 3	One multipart question on the "Final Exam" is entered in the Gradebook as "LS Assignment 3"	

#### **Alternative to Canvas Gradebook**

	Α	В	С	D	E	F	G
1	Course	Section	SLO	Assignment Name	Points Possible	Student	Points
1	Course	Section		Name	Possible	Emplid	Achieved
	00 10044	0004	SLO #6: Analyze claims	01.0.0	40	00000004	0.5
2	CCJ3011	0001	about social phenomena.	SLOb	10	00000001	9.5
3	CCJ3011	0001				00000002	10
4	CCJ3011	0001				00000003	9.7
5	CCJ3011	0001				00000004	9.7
6	CCJ3011	0001				00000005	9.5
7	CCJ3011	0001				00000006	-
8	CCJ3011	0001				00000007	9.7
9	CCJ3011	0001				00000018	10
10	CCJ3011	0001				00000019	10
11	CCJ3011	0001	SLO #3: Discuss the role of social factors in contemporary problems	SI O 3	10	00000001	0.2
		0001	or personal experiences.	SLU 3	10	00000001	9.2
12	CCJ3011					_	10
13	CCJ3011	0001				00000003	9.5
14	CCJ3011	0001				00000004	9.3
15	CCJ3011	0001				00000005	0
16	CCJ3011	0001				00000006	9.7
17	CCJ3011	0001				00000007	9.7
18	CCJ3011	0001				00000018	9.3
19	CCJ3011	0001				00000019	9.5

# Process of Data Extraction, Transformation, Loading, and Visualization



# Level 1 – Department by SLO

Each report begins with one page that summarizes assessment data at the level of the overall department.

#### Level 1 - Department by SLO



Unique Students Assessed

478

Student Location & Course Section Modality
Tallahassee Online

Assessment Score Counts by SLO					
Assessment Score Bucket	SLO #3	SLO #6			
Range 90%-100%	282	359			
Range 80%-89%	120	89			
Range 70%-79%	41	18			
Range 60%-69%	17	9			
Range 1%-59%	21	6			

#### Average Assessment Score

SLO #3

SLO #6

88%

92%

% of Assessment Scores At or Above the 70th Percent Threshold

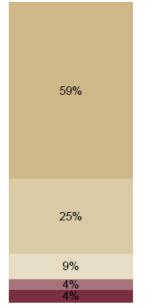
SLO #3

SLO #6

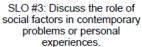
92%

97%





# SLOs Assessed





SLO #6: Analyze claims about social phenomena.

### SUMMARY STATISTICS

# SLOs Assessed

2

**Unique Students Assessed** 

478

Count of SLOs for which assessment scores are displayed





Count of unique student IDs with an assessment score displayed

Average Assessment Score

SLO #3

SLO#6

88%

92%



Average assessment score for each SLO

### **MET THRESHOLD?**

FSU established a standard benchmark for all general education student learning outcomes – at least 80% of the students participating in selected assignments earn 70% (or a C-) or better.

These cards present the percent of assessment scores/instances that meet the 70% (C-) threshold for each SLO





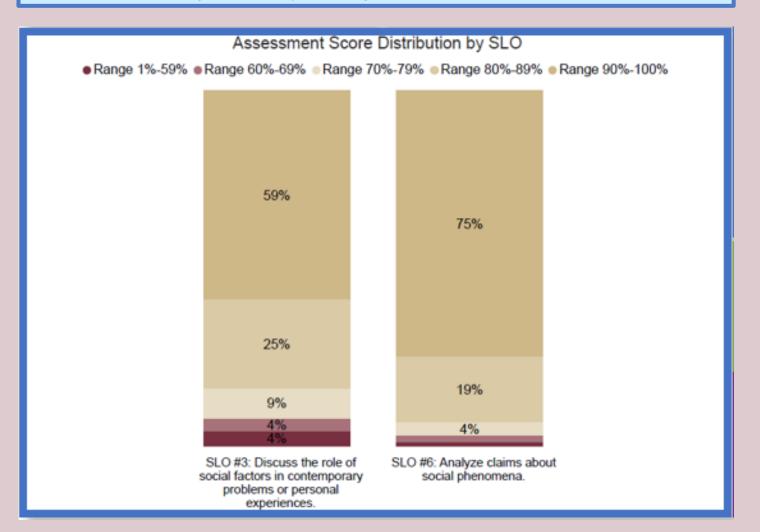
```
% of Assessment Scores At or Above the 70th Percent Threshold

SLO #3 SLO #6

92% 97%
```

### **DISTRIBUTION BREAKDOWN**

This 100% stacked column chart shows the distribution of assessment scores grouped by letter grade buckets for each SLO



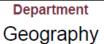
### **DISTRIBUTION BREAKDOWN**

Assessment score are listed by assessment score bucket for each SLO in a table for reference

Assessment Score Counts by SLO					
Assessment Score Bucket	SLO #3	SLO #6			
Range 90%-100%	282	359			
Range 80%-89%	120	89			
Range 70%-79%	41	18			
Range 60%-69%	17	9			
Range 1%-59%	21	6			

**Note**: Any assessment scores of 0 are not included in any visuals or calculations

#### **Level 1 - Department by SLO**



# SLOs Assessed

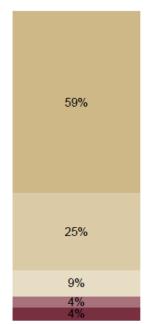
2

**Unique Students Assessed** 

478

#### Assessment Score Distribution by SLO

● Range 1%-59% ● Range 60%-69% ● Range 70%-79% ● Range 80%-89% ● Range 90%-100%



SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.



SLO #6: Analyze claims about social phenomena.

### Student Location & Course Section Modality Tallahassee Online

Assessment Score Counts by SLO				
Assessment Score Bucket	SLO #3	SLO #6		
Range 90%-100%	282	359		
Range 80%-89%	120	89		
Range 70%-79%	41	18		
Range 60%-69%	17	9		
Range 1%-59%	21	6		

#### Average Assessment Score

SLO #3

SLO#6

88%

92%

#### % of Assessment Scores At or Above the 70th Percent Threshold

SLO #3

SLO #6

92%

97%

### **Analysis**

#### **Questions to Consider:**

- 1) Overall, is the department satisfied with the level of student learning? If so, why? If not, why not?
- Were demonstrated levels of learning consistent across different SLOs? Comment on potential sources for similarities and differences.
- 3) Where do students appear to be struggling to demonstrate that they learned the target knowledge, skills and/or values/attitudes? Comment on factors impacting student success in the SLOs.

# Level 2 – Course by SLO

The next pages in the report are at the level of each course included in assessment and provide data for all SLOs.

The # of pages is dependent on the # of courses in the department.

#### Level 2 - Course by SLO

**Department**Geography

Course GEO1330 Student Location & Course Section Modality
Tallahassee Online

# SLOs Assessed

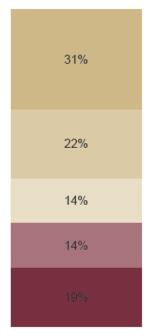
2

**Unique Students Assessed** 

64

Assessment Score Distribution by SLO

● Range 1%-59% ● Range 60%-69% ● Range 70%-79% ● Range 80%-89% ● Range 90%-100%



SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.



SLO #6: Analyze claims about social phenomena.

Assessment So	core Counts b	y SLO
Assessment Score Bucket	SLO #3	SLO #6
Range 90%-100%	20	48
Range 80%-89%	14	2
Range 70%-79%	9	
Range 60%-69%	9	2
Range 1%-59%	12	4

Average Assessment Score

SLO #3

SLO #6

75%

95%

% of Assessment Scores At or Above the 70th Percent Threshold

SLO#3

SLO#6

67%

89%

#### Level 2 - Course by SLO

**Department**Geography

Course GEO1330 Student Location & Course Section Modality

Tallahassee F2F

# SLOs Assessed

2

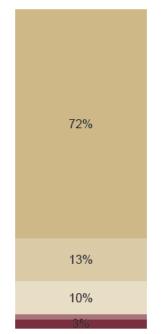
**Unique Students Assessed** 

69

Assessment Score Counts by SLO **Assessment Score** SLO #3 SLO #6 Bucket Range 90%-100% 17 48 Range 80%-89% 9 14 Range 70%-79% 7 27 Range 60%-69% 1 5 Range 1%-59% 2 6

#### Assessment Score Distribution by SLO

● Range 1%-59% ● Range 60%-69% ● Range 70%-79% ● Range 80%-89% ● Range 90%-100%



SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.



SLO #6: Analyze claims about social phenomena.

**Average Assessment Score** 

SLO#3

SLO #6

90%

78%

% of Assessment Scores At or Above the 70th Percent Threshold

SLO#3

SLO #6

96%

84%

### **Analysis**

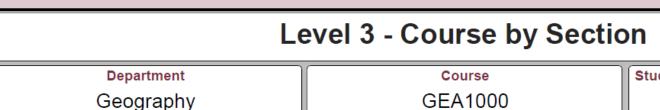
#### **Questions to Consider:**

- 1) Were demonstrated levels of learning consistent across different courses? Comment on potential sources for similarities and differences.
- 2) Did students struggle with some SLOs in some courses more than in others? Comment on any differences and the contributing factors.
- 3) For courses with face-to-face and online sections, were demonstrated levels of learning consistent across different delivery modes? Comment on potential sources for similarities and differences.
- 4) In cases where there are outlier courses, some circumstances to consider include:
  - 1) Did all courses provide students with an adequate opportunity to learn and practice each SLO before assessment?
  - 2) Do the course objectives clearly align with the general education SLOs assigned to the course?

# Level 3 – Course by Section & SLO

The next pages in the report provide assessment data at the level of each course section and for each SLO.

The # of pages is dependent on the # of courses and # of SLOs assessed in the department.



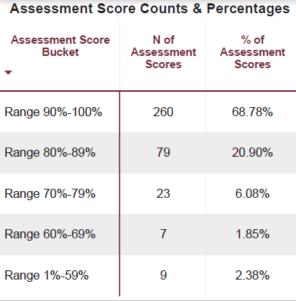
Student Learning Outcome

SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.

Unique Students Assessed

378



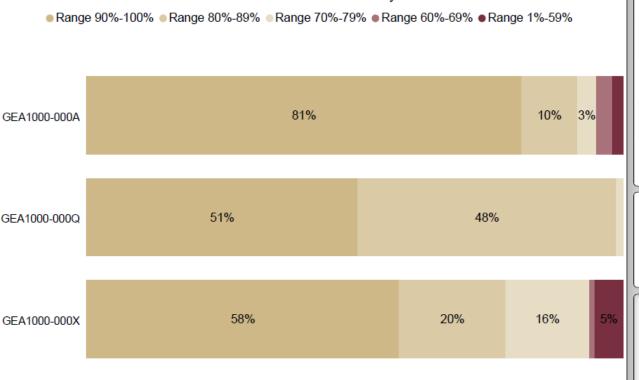


Average Assessment Score

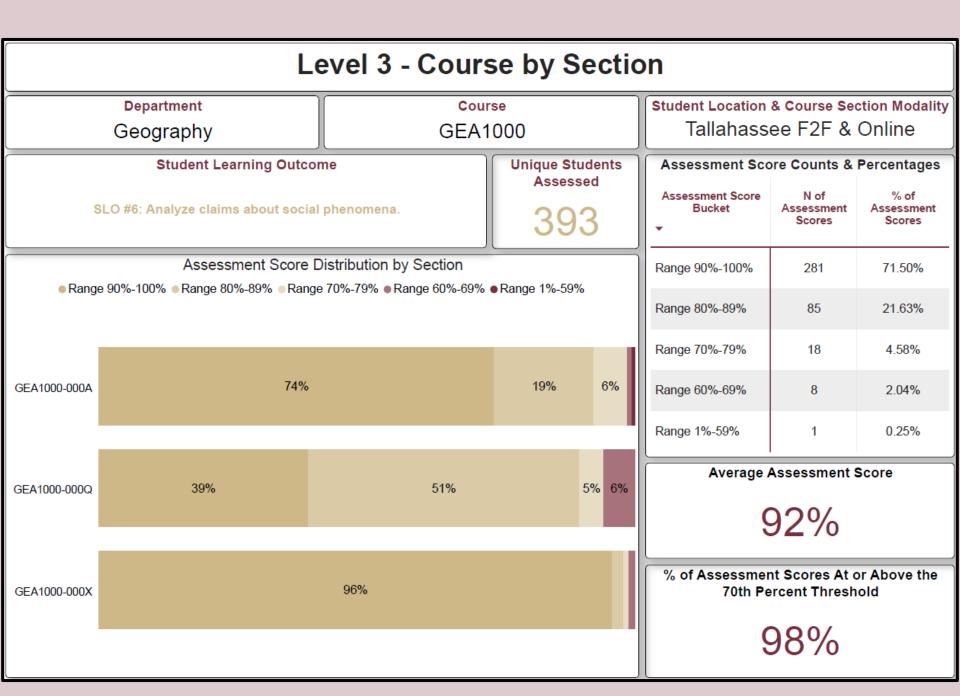
90%

% of Assessment Scores At or Above the 70th Percent Threshold

96%



Assessment Score Distribution by Section



### **Analysis**

#### **Questions to Consider:**

- Were demonstrated levels of learning consistent across different courses? Comment on potential sources for similarities and differences.
- 2) In cases where there are outlier sections, some circumstances to consider include:
  - Differences in instructor experience, course materials, assignments, textbooks, etc.
  - 2) Differences in approach to assessing general education student learning outcomes.

# Catalog

The last page in the report provides information on the assignment name(s) used to assess each SLO in each course section.

#### Catalog - Assignment Name by Course Section & SLO

Masked Section	SLO	Assignment Name
GEA1000-000A	SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.	News Notebook Submission 5 of 5
GEA1000-000A	SLO #6: Analyze claims about social phenomena.	Test 3
GEA1000-000Q	SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.	Assignment 2
GEA1000-000Q	SLO #6: Analyze claims about social phenomena.	Assignment 4 (Brochure)
GEA1000-000X	SLO #6: Analyze claims about social phenomena.	Globalization Analysis
GEA1000-000X	SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.	Globalization Discussion
GEO1330-000S	SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.	Unit 1: Reading Assignment 1
GEO1330-000S	SLO #6: Analyze claims about social phenomena.	Unit 6: Reading Assignment 6
GEO1330-000W	SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.	Week 12: Assignment #6
GEO1330-000W	SLO #6: Analyze claims about social phenomena.	Week 5: Assignment #3
GEO1400-000L	SLO #6: Analyze claims about social phenomena.	Final Critical Analysis
GEO1400-000L	SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.	Helena Dirty Pretty Things Discussion Forum
GEO1400-000L	SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.	Joanne Dirty Pretty Things Discussion Forum
GEO1400-000P	SLO #3: Discuss the role of social factors in contemporary problems or personal experiences.	Location Analysis Final Paper
GEO1400-000P	SLO #6: Analyze claims about social phenomena.	Source Analysis Paper

### **Analysis**

#### **Questions to Consider:**

- 1) How are the chosen assignments and assignment prompts a valid and reliable method to assess the SLOs?
- 2) When multiple different assignments are used to assess a single SLO, which assignment allows students the best opportunity to demonstrate mastery of the target SLO? Beyond the one best-fitting assignment, how does each additional assignment provide value for SLO assessment?
- 3) When multiple SLOs are assessed using a single assignment, which SLO is best measured by the selected assignment or a portion of the selected assignment? Are there alternative assignments or portions of assignments that may be better fitting for assessment of the remaining SLOs?

### **Overall Analysis**

The Overall Analysis draws together the observations/comments from the previous level analyses (1-3 and Catalog) to form a comprehensive review of what is occurring in the general education courses offered by the department.

#### Questions to Consider:

- 1) What are the major takeaways from the results for levels 1-3 and Catalog?
- 2) What are the recurring themes in the analyses, if any?
- 3) Taken together, what do the above analyses say about the department's general education offerings?

# SLO Results, Analysis, and Improvement Process Flow

#### **Early Spring**

Departments receive a PDF copy of their SLO reports & template to fill out with their analysis & improvement

#### Early Fall

Departments review the SLO reports, analyze them, formulate improvements & submit report

#### Late Fall

LSCPC receives SLO reports & departmental reports; reviews and approves

# **Evolution of Assessment Process**

#### **Fall 2021**

First assessment cycle with new data collection and visualization process implemented.

#### Fall 2022

Updates to data visualization to simplify formatting and highlight key summary statistics; Increased communications and optional training for departments.

#### Fall 2023

Updates to information request templates; Frequent communication and required attendance at Gen Ed Assessment trainings.

### **Continuing Steps**





Surface Interactive Version of Report



Expand
Sample to
more Gen
Ed
Courses

### **Questions?**

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