



HOW IR OFFICES CAN PARTNER WITH ACADEMIC DEPARTMENTS TO BENEFIT STUDENTS AND THE UNIVERSITY

TAIR 2023 –Dr. Morgan Carter and Dr. Dennis Jones

LEARNING OUTCOMES

- Identify strategies to partner with academic programs at your institution
- Identify data sets and tools that can be used for data visualization and data science projects
- Create a pipeline of talent who might not have considered IR as a career choice



ABOUT TARLETON

- Level V Institution
- Carnegie High Research Activity
- Growing Regional Comprehensive University
- NCAA Division I
- Reaffirmation Class of 2021



ABOUT YOU

POLL



HISTORY OF TARLETON IR OFFICE

Structure – 2010-2021



HISTORY OF TARLETON IR OFFICE

WebFocus

The screenshot shows the WebFocus interface for Tarleton State University. The top navigation bar includes the university logo and name. A left-hand menu lists various reports, with 'Student Headcount' selected. The main content area is titled 'Banner THECB 001 - Student Report' and includes a description: 'This Report Uses Certified THECB Enrollment Data Combined With Banner Data To Provide The User With A Variety Of Reports.' Below this are several dropdown menus for filtering: Year (2022), Semester (Fall), and Course Term (ALL). There are also six sorting options (Sort 1-6), all currently set to 'None'. At the bottom, there are options to 'Select Across Value' (set to None) and 'Select type of display' (HTML, PDF, or Excel). A 'Submit' button is located at the bottom right of the configuration area.

Tarleton State University Headcount for Fall 2022

SID	Combined
14092	14092

TOTAL Headcount

14092

14092

Note: Total Enrollments from Certified THECB Data
Campus, Student Type, Major, Concentration & Minor breakdown from Uncertified Banner Data

Page 1 of 1

Run Date: Feb 21, 2023

Report: WF0001



HISTORY OF TARLETON IR OFFICE

- Growth
- Need for Advanced Analytics
- Need for new structure
- Summer 2021 – Change started to occur



Ashley's Project

- President's Excellence in Scholars Research (PERS) Initiative
- Poster presentation
- Showed our office could utilize GAs



Ashley Hall
Graduate Research Assistant
Major: MS Information Systems

Morgan Carter
Director
Institutional Analytics, Effectiveness, and Accreditation

Visualizing Canvas LMS Metadata for Student Success



Abstract

Student Information Systems (SIS) collect a myriad of data elements to help contextualize relationships between students and Tarleton State University. Institutional analytics traditionally involves the examination of SIS data (demographic data, admissions, enrollment, grades, financial data, etc) to determine information about the student body. These data may provide administration with insight into retention and attrition trends among those variables available in the SIS. However, the common SIS data used for this analysis does not provide many other variables necessary to develop targeted student success strategies. The Canvas Learning Management System (LMS) gathers data about how students interact within the online learning environment. The Canvas LMS amasses thousands of data elements on each student from broad features like course enrollment, to fine details like the amount of time spent viewing a specific assignment. LMS data could provide valuable guidance to administrators, advisors, and professors about the development of strategies aimed at improving student engagement and success. However, these data are largely unstructured and difficult to understand. Visualizations can give context to complex data. Our aim for this research was to find the best strategy for harnessing Canvas LMS metadata to improve student success, particularly with our student-athlete pilot group. Using an iterative prototyping approach, our team worked with the Athletics departments to design visualizations relevant for their particular student success tracking requirements. Information Technology Services and Academic Technology departments also assisted with the project. The overall goal was to deliver a set of visualizations that may help identify patterns indicating potential decline in student engagement and success. Preliminary results of the three-month project include an initial set of drill-down visuals for assignment submission tracking and student-athlete enrollment in various subjects. With additional time and support, future iterations of the dashboard could include real-time data fetching, allowing the department to generate insightful visualizations on demand. Additionally, the understanding and accuracy of the metadata used for visualizations will increase as the LMS is more widely adopted into campus learning environments.

Conclusions

- Accuracy of analysis and visualization dramatically improves with increased use of LMS
- Inconsistent use of LMS decreases precision of analysis
- Project time constraints limited depth of research
- Continued efforts in visualizing LMS data could provide valuable insight into student success factors

Methods

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Metadata Categories
Variable Identification
Initial Identification of report variables

Attribute: System identifier
Description: purpose
Type: How data is generated
Source: Initiating system or user
Value: Expected field data

Results

Heatmap

Sport by Assignment Submission

Bar Chart

Assignment Submission by Month Filtered by Sport

Fall 2020 Freshman Canvas Activity Heatmap

Student Athletics

Fall 2020 Score Activity Matrix

Student Athletics

Core Category	CSIS	SECS	SENA	SEBS	SECC	SEFO	Sport	SEBS	SECC	SEFO	SEBS	SECC	SEFO	SEBS	SECC	SEFO
Act	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
EngComm	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Gen	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Hist	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
LPC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Math	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sci	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SocSci	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Acknowledgements

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- Dr. Dennis Jones & Dr. Joseph Schuessler, Computer Information Systems
- Athletics
- Academic Technology
- Information Technology Services

References

Freitas, Sara & Gibson, David & Pileggi, Court & Halloran, Patrick & Williams, Ed & Ambrose, Matt & Dunwell, Jan & Arns, Sylvester (2014). Foundations of dynamic learning analysis: Using university student data to increase retention. *British Journal of Educational Technology*, 46, 10.1111/bjet.12212.

Dalwin, Durson. (2011). Predicting Student Attrition with Data Mining Methods. *Journal of College Student Retention: Research, Theory and Practice*, 13, 17-35. 10.1209/QJ.13.1.1.b.

Murthy, L. P., & Dawson, S. (2010). Mining LMS data to develop an "Early warning system" for educators: A proof of concept. *Computers & Education*, 54(2), 588-599. <https://doi.org/10.1016/j.compedu.2009.09.008>

Mi, C. (2019). Student performance early warning based on Data Mining. *International Journal of Performance Engineering*, 15(1), 822-833. <https://doi.org/10.23940/ijpe.15.01.p11.822833>

9 TARLETON STATE UNIVERSITY

MS-IS Program

- 25 Years
- ~65 Students
- Current IR staff
- Previous CIS Prof built Texan Facts



CIS Partnership

- My history with the CIS department and Dr. Jones
- The desire to help both our office and Dr. Jones' students with real world projects
- Our office needed assistance testing and previewing the many visualization products on the market



OFFICE'S PARTNERSHIP GOALS

- Thinking outside the IR box
- How do students think and design
- Met with Dr. Jones' class regularly
- Begin to build pipeline of talent



OPPORTUNITIES & CHALLENGES

- Opportunities

- Students have some Business Understanding (e.g., retention)
- Students have some Data Understanding (e.g., grades, classes)
- Expose Students to Data Related Careers
- Visibility for IR Office with Faculty

- Challenges

- Aligning Partnerships with Course Outcomes
- Aligning Instructor's Expectations with IR Staff Expectations
- Time Commitment from IR staff
- Working with Students who are Remote & Full-Time Professionals



NEXT STEPS

- Develop Consistent Sequence of Data Related Courses
 - Business Intelligence (Required for Graduate Program)
 - Data Engineering (Elective)
 - Data Science (Elective)
 - Data Visualization (Elective)
- Providing Additional Student Experiences
 - Graduate Assistantships
 - Internships



DATA SETS

- Public Data Sets from THECB
- Anonymized data set (too much)
- Dummy Variables (owns dog)
- Current Cloud efforts for future data sets



Projects

Student Assignments for Comprehensive Project 1

Tables from http://www.txhigheredaccountability.org/acctpublic/
Graduation and Persistence Rate Counts (Six Years) & Graduation Rate
Enrollment by Gender, Ethnicity and Classification (including overall enrollment)
Persistence Rates (focus on both 1-year & 2-year rates at same institution)
Student Faculty Ratio & Faculty Headcount (Fall)
Student Loan Debt to First Year Wage (Median) & Student Loan Debt (Average)
Research Expenditures by Source (including overall expenditures)
Degrees and Certificates Awarded – Economically Disadvantaged & Degrees and Certificates Awarded by Gender, Ethnicity, Level and Region



WebFOCUS Dashboard

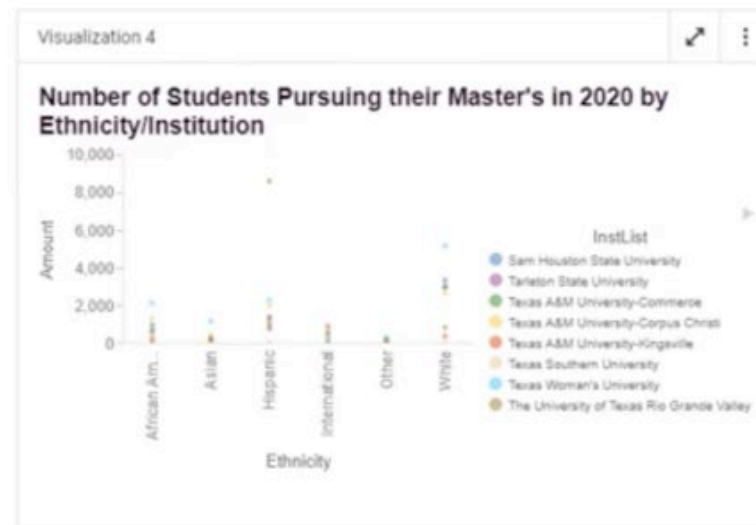
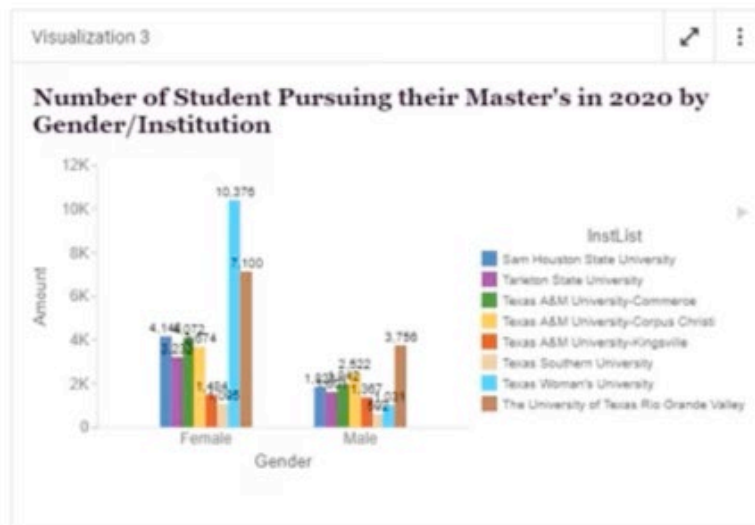
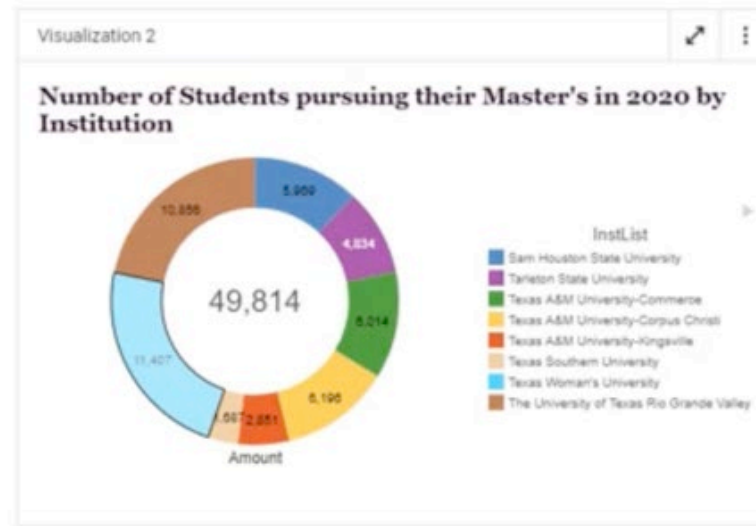
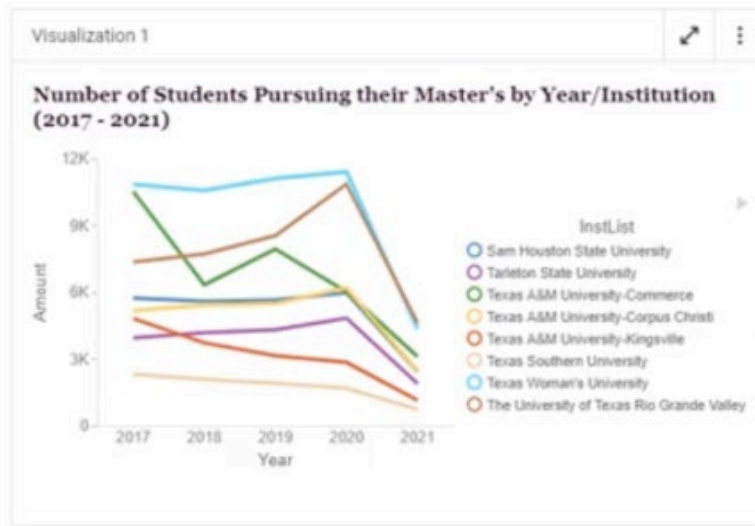
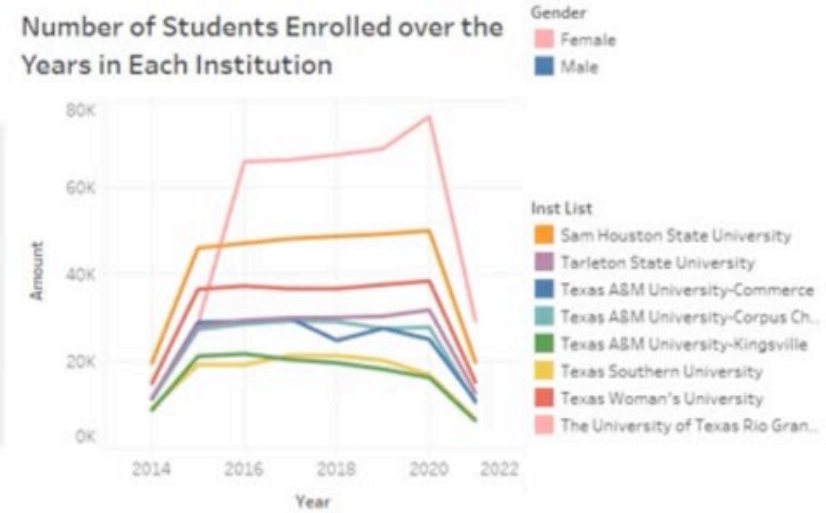


Tableau Dashboard

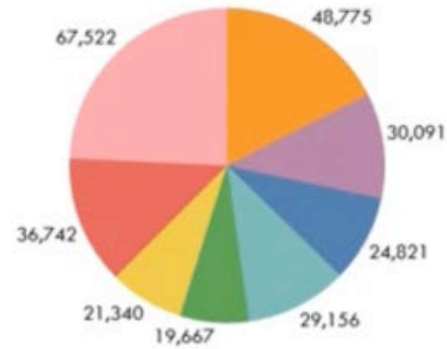
Number of Students Enrolled in Fall 2018 by Gender

Inst List	Gender	Amount
Sam Houston State University	Female	13,225
	Male	7,800
Tarleton State University	Female	8,149
	Male	4,969
Texas A&M University-Commerce	Female	7,479
	Male	4,593
Texas A&M University-Corpus Christi	Female	7,221
	Male	4,708
Texas A&M University-Kingsville	Female	4,153
	Male	4,388
Texas Southern University	Female	5,664
	Male	4,068

Number of Students Enrolled over the Years in Each Institution



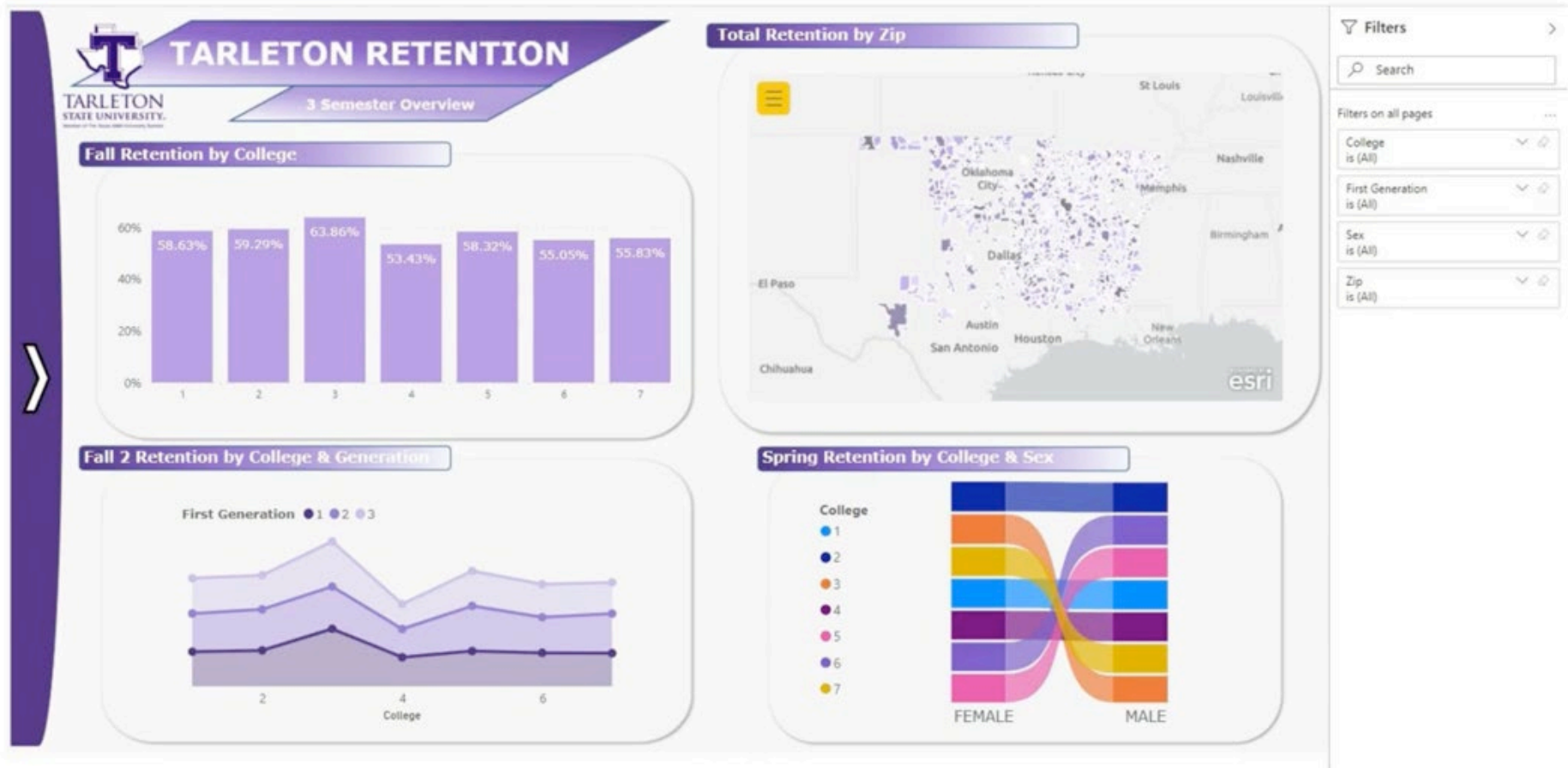
Number of Students Enrolled in 2018 by Institution



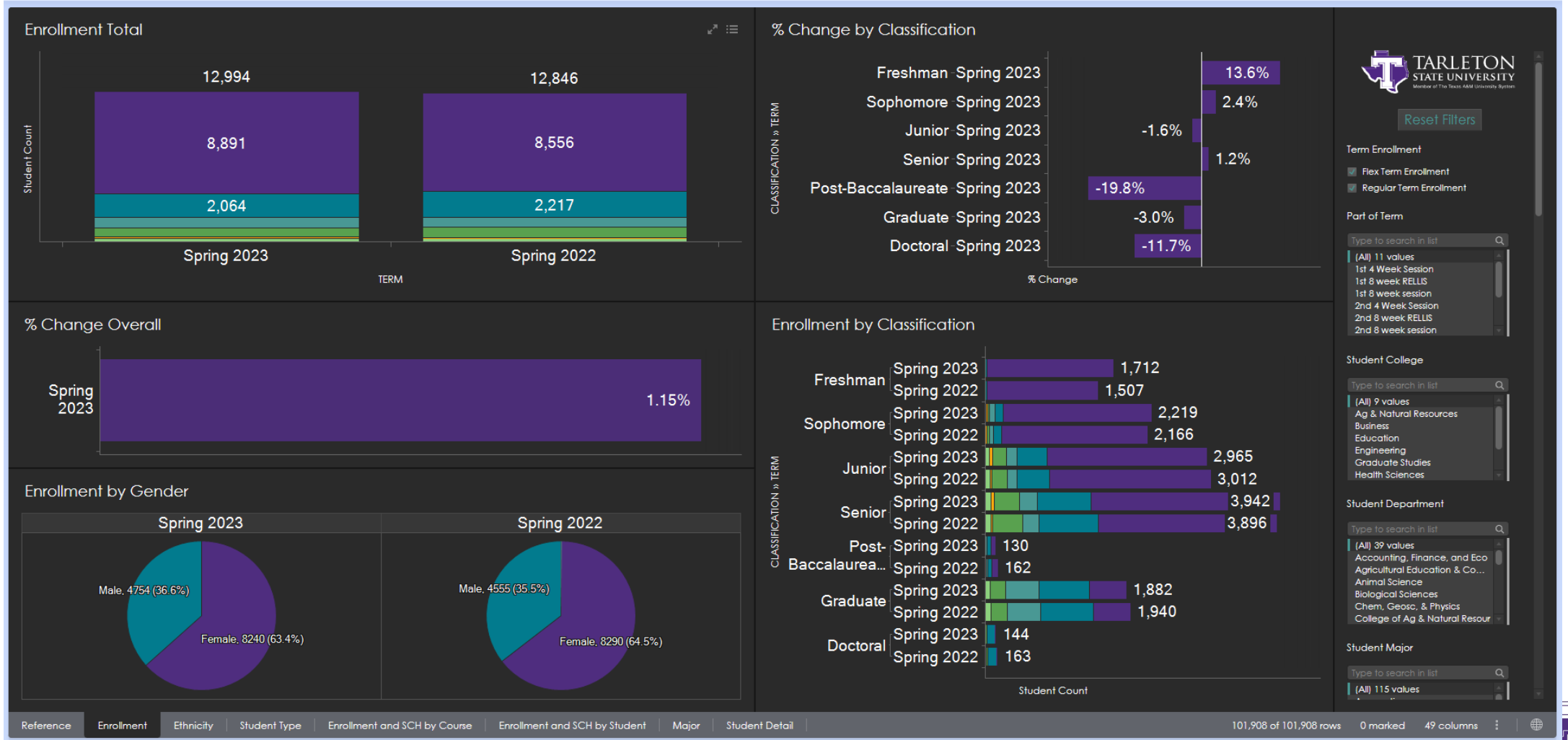
Number of Enrolled Students at Each Institution in 2018 by Classification



Power BI Dashboard



SPOTFIRE



SPOTFIRE

Session: D2

Room: Cedar II

Level: Intermediate

Audience: 4 Year, Public

Title: Out With The Old, In With The New- A Path to Modernizing a University Reporting Tool

Track: Collect, Analyze, Interpret, and Report

Presenter(s): Jamie Wood, Simon Smith, Randy Price, & Toni Floyd; Tarleton State University

Description: Tarleton State University is modernizing our data visualization and reporting tool. This session will take you through our journey from software identification and testing to implementation and the release of our first, modern, interactive dashboards in 15 years. We will share our lessons learned and provide an interactive demonstration of what we have been able to deliver to our university.

Session Facilitator: Michele Hancock, Tarleton State University



SUMMARY

- Years long process, start now identifying strategies you might use to incorporate GA students
- This academic departmental partnership can benefit many entities
- Exposure to IR office projects to hopefully build the IR talent pipeline



THANK YOU!

QUESTIONS?

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