Learning Analytics for Continuous College Improvement

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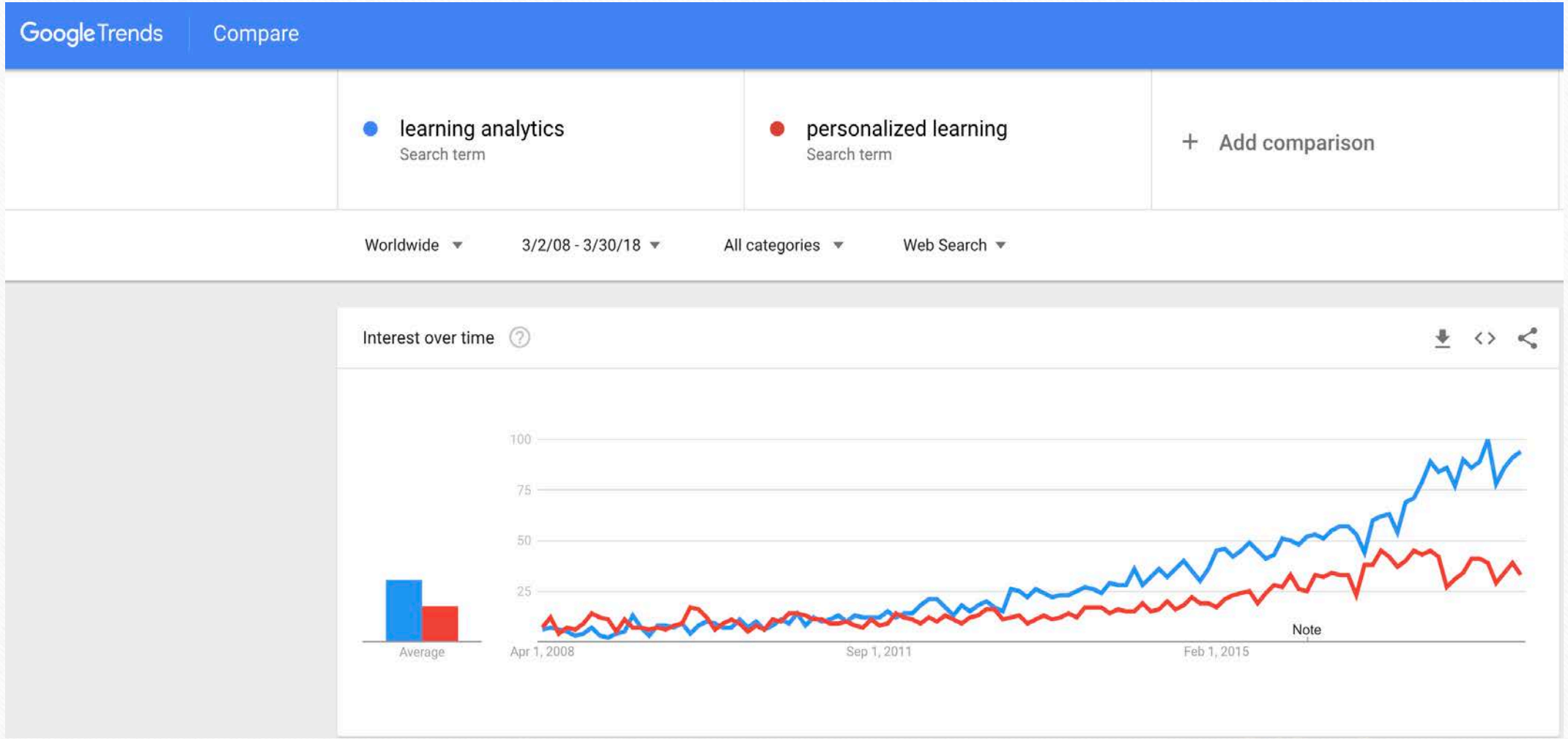
Learning Analytics

- Collection, analysis, and application of data to assess behavior of learning communities (Larusson & White, 2014).

Quick Poll

- Do you use learning analytics outside of a gradebook or quiz results to improve the courses you teach?
- Do you use learning analytics to monitor struggling students across a program or multiple courses?
- Do you use learning analytics to support accreditation requirements?


Google Trends
Compare
learning analytics
Search term
personalized learning
Search term
+ Add comparison
Worldwide
3/2/08 - 3/30/18
All categories
Web Search
Interest over time
100
75
50
25
Note
Average
Apr 1, 2008
Sep 1, 2011
Feb 1, 2015

Learning Analytics

- Common approaches:
  - Statistical techniques, predictive modeling, interactive visualizations, taxonomies and frameworks

Learning Analytics

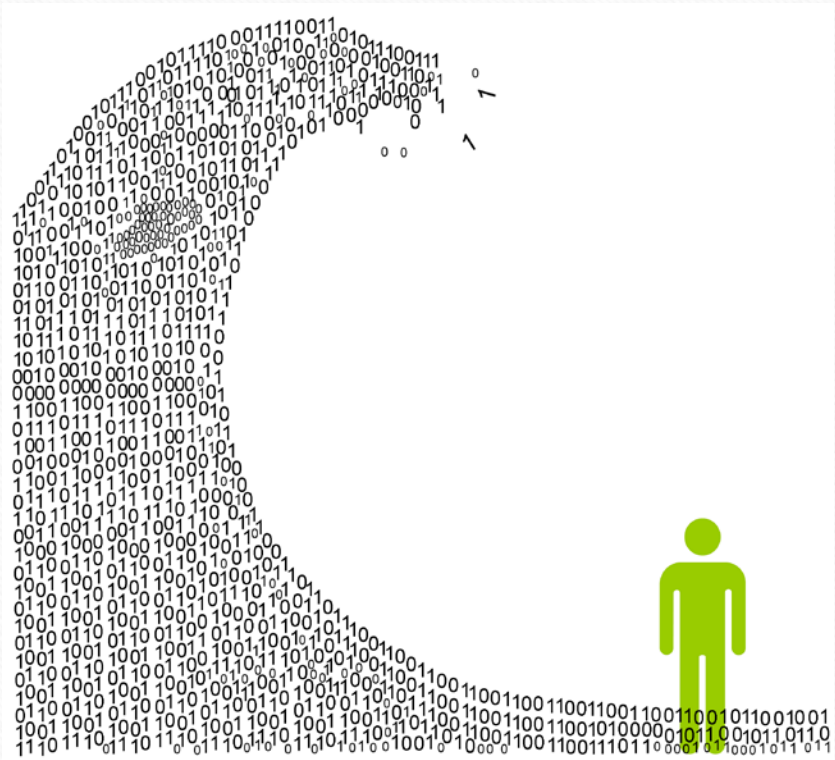
- Common Use Cases:
  - Optimize student and faculty performance
  - Improve pedagogical strategies and curriculum mapping
  - Highlight potentially struggling students

Why Learning Analytics Today

- Learning Management Systems, institutional data warehouses, and digital records are ubiquitous.
- Linking unconnected external institutional data to existing data structures offers even more opportunities to understand teaching and learning in higher education.

Speaking of data…

Are you crushed by the data wave?



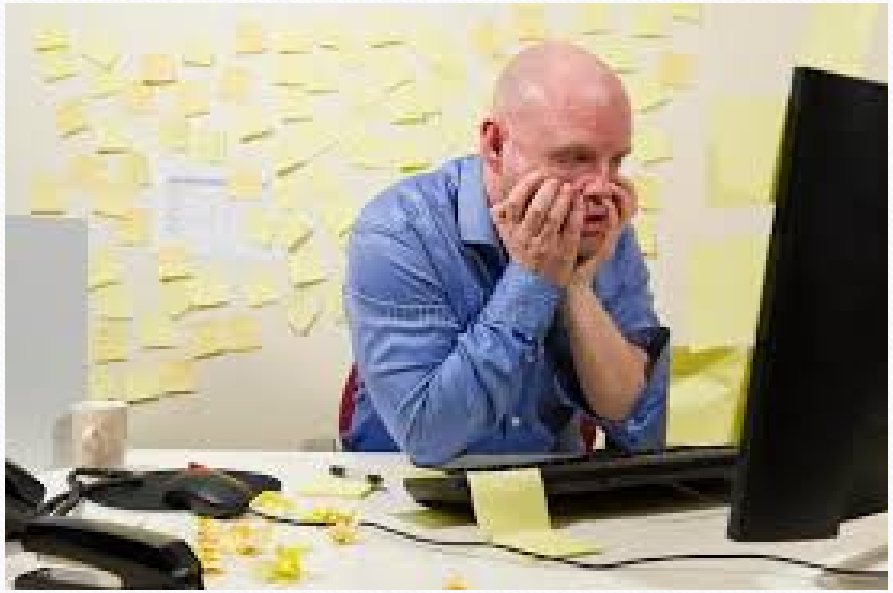
“Jobs to be Done”

Love People, not Data

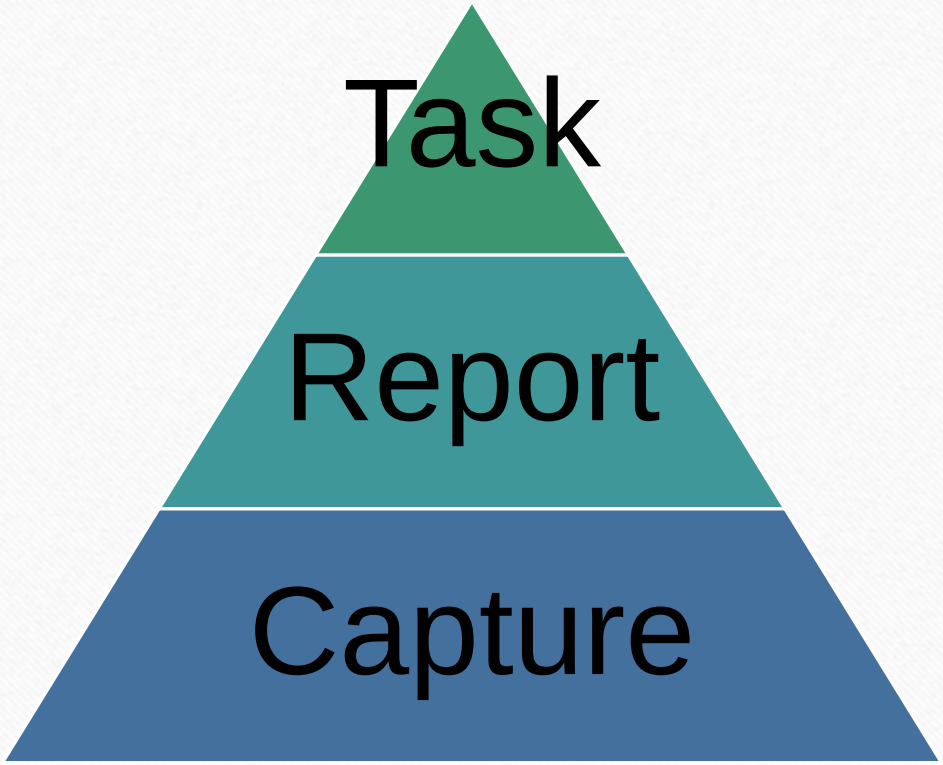
Focus on what your faculty, administration, staff and students are trying to accomplish in a given situation or circumstance as compared to the data, the models, the methods, etc.

(cf. Clayton Christensen’s “Jobs to be Done” theory.)

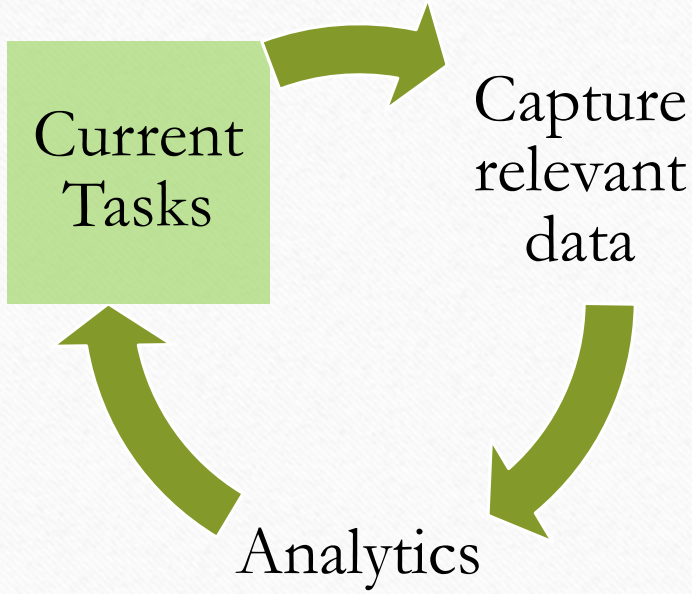
Simple Evaluation Metric: Do your learning analytics improve the “jobs to be done”?



Common Learning Analytics Approach



Finding ROI



Where to begin?

- What are students, faculty, and administrators trying to do?
  - Passing tests, earning grades, and completing degrees…does your analytics support the student's current study/work practices or is it built for an ideal student that may or may not exist?
  - Developing more effective lessons and assessments. . .does your analytics support a faculty member's desire to assess the quality of the instruction or does it merely provide performance metrics?
  - Documenting competencies, outcomes, and standards. . .does your analytics allow for both a granular level of detail (one student) in addition to a macro view of program/course performance for competencies with appropriate metadata?

Learning Analytics at the College of Pharmacy

- **Why Learning Analytics**
  - **Continuous Improvement:** Strategies for improvement started to require analysis of data from diverse sources to understand areas we wanted to improve. Example:
    - **Predict success on the National Board Exam:** How does admissions data, performance across courses, soft-skills assessments, and performance in the clinical setting contribute to passing the board on first attempt? (Diverse data sets that are housed in 4 different offices)

Learning Analytics at the College of Pharmacy

- **Why Learning Analytics**
  - **We Need Reports "Just in Time":** Sometimes an understanding of data is needed frequently (ie, weekly) to address needs. (We cant wait for the annual SACs reporting). Example:
    - **Tracking of Student Professionalism Across multiple course :** We wanted to identify a student who is acting unprofessionally in active learning sessions. To accomplish this, staff were manually tracking data in excel sheets and flagging students who had frequent problems. (time intensive for staff and risk of error)

Accreditation Requirements

- Recent changes to the ACPE Standards have resulted in a need outcomes assessment data in multiple areas (knowledge, practice skills, soft-skills, clinical reasoning, outcomes from co-curricular activities).
  - To interpret the outcomes data, we need to consider factors (ie, input data) that contributed to the findings. This involves diverse data courses.
  - **Learning analytics is not an accreditation requirement. But, learning analytics helps us do a better job in continuously tracking all these data and generating reports that can be meaningfully interpreted.**

How Learning Analytics Can Benefit Your Program

- Your program does NOT have to involve the extensive outcomes assessments that pharmacy has to benefit from learning analytics.
- Examples of how learning analytics can be used by any College/Program here at UF:
  - Early identification of "at risk students"
  - Faculty Teaching Evaluations:
    - How does an individual faculty member compare to other faculty in the department and College.
    - How does a chair determine that a faculty member's evaluations are significantly lower than others in the College? (without having to do a lot of analysis themselves)

Learning Analytics For Intervention of Students at Risk

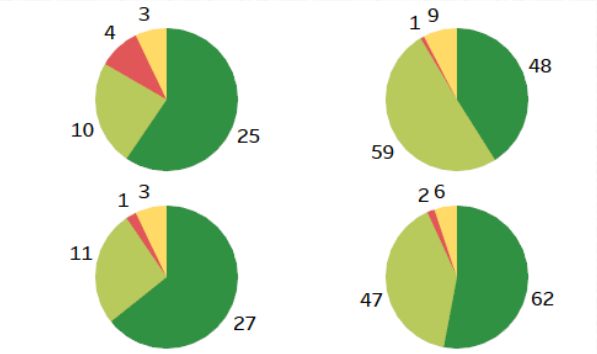
Cohort1	Campu...	Fake Student ID	PHAS176: Drug Delivery Systems	PHAS439: Principles of Medicinal Chemistry & Pharma...	PHAS560: Pathophysiology & Patient Assessment I
Class of 2021	GNV	802933			67.5
		926949			67.3
	JAX	860159	68.7		
		866153	68.7		
		870349			68.7
		933402	68.3	67.6	67.0
		934015	69.1		69.0
		934430			67.7
		934432	68.3	67.6	67.0
		934454			68.7
	ORL	910861	67.6		
		934423	65.3		
		934427		67.1	67.5
		934451	65.3		
		934463			68.2
		934517	67.6		68.8
		934521	65.3		
		935468			68.2

Term	Course
Fall 2016	PHAS214: Advanced Topics in Community Pharmacy Practice, Fall 2016
	PHAS702C: Personal & Professional Development III, Fall 2016
	PHAS933: Principles of Pharmacoeconomics, Fall 2016
	PHAS163L: Professional Skills lab III, Fall 2016
	PHAS755: Principles of Medical Microbiology, Immunology and Virology, Fall 2016
	PHAS782C: Patient Care 2, Fall 2016
	PHAS879C: Patient Care 3, Fall 2016
Spring 2017	PHAS933: Sterile Compounding, Spring 2017
	PHAS164L: Professional Skills Lab 4, Spring 2017
	PHAS784C: Patient Care 4, Spring 2017
	PHAS787C: Patient Care 5, Spring 2017
Fall 2017	PHAS702C: Personal and Professional Development III, Fall 2017
	PHAS177C: Advanced Nonsterile Compounding, Fall 2017
	PHAS226C: Patient Safety & Quality, Fall 2017

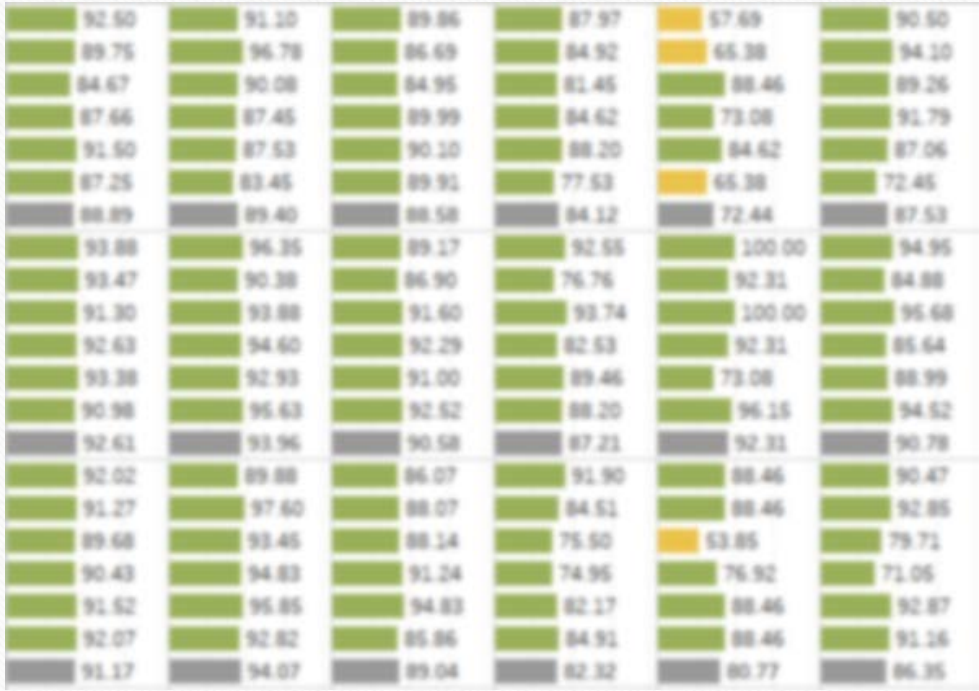
Color
A- to A
B- to B+
C- to C+

Learning Analytics Related to Faculty Teaching Evaluations

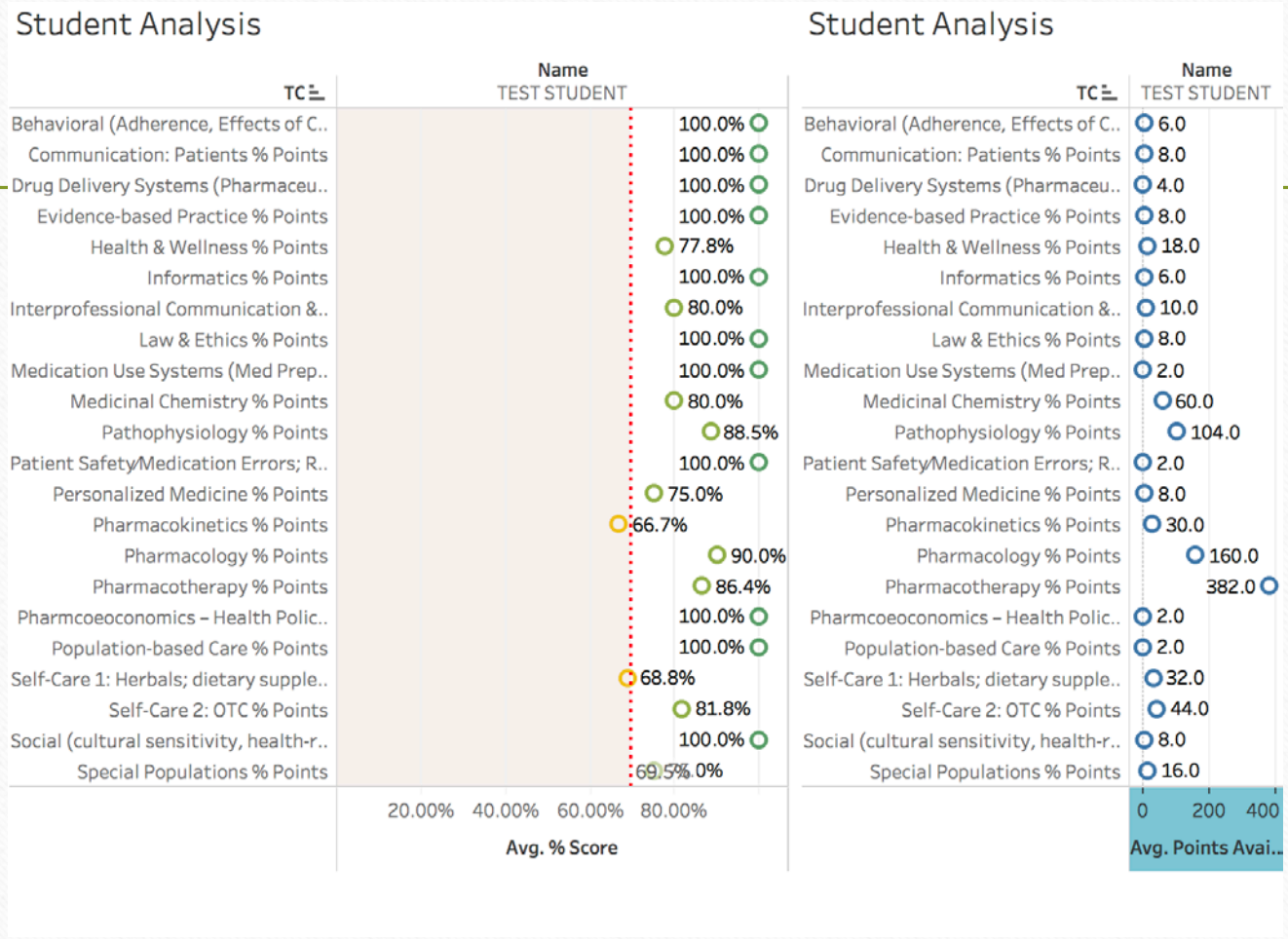
Q1: Description of course objectives and assignme..	Q2: Communication of ideas a..	Q3: Expression of expectatio..	Q4: Availability to assist students in or out of class	Q5: Respect and concern for students	Q6: Stimulation of interest ..	Q7: Facilitation of learning	Q8: Enthusiasm for the subject	Q9: Encouragement of indepen..	Q10: Overall rating of the instructor	Mean of Items 1-9	Amount learned	Difficulty of the subject matter	The educational value (relev..
4.37	**4.22**	**4.29**	**4.32**	**4.41**	**4.22**	**4.20**	**4.46**	**4.36**	**4.27**	**4.32**	**4.17**	**3.82**	**4.35**
3.69	3.15	3.45	3.16	3.03	3.32	3.06	4.38	3.43	3.03	3.41	3.31	3.49	3.80
4.32	4.18	4.15	4.22	4.39	3.96	4.06	4.07	4.18	4.09	4.17	3.98	3.70	4.06
4.43	4.22	4.38	4.25	4.49	4.15	4.28	4.18	4.24	4.29	4.29	4.23	3.41	4.42
4.57	4.59	4.59	4.63	4.65	4.49	4.55	4.55	4.53	4.59	4.57	4.57	3.51	4.57
4.67	4.64	4.62	4.50	4.64	4.51	4.59	4.67	4.64	4.59	4.61	4.62	3.54	4.67
4.62	4.65	4.61	4.56	4.73	4.61	4.59	4.68	4.55	4.61	4.62	4.39	3.47	4.49
4.88	4.83	4.84	4.89	4.92	4.80	4.82	4.84	4.80	4.89	4.85	4.73	3.40	4.66
4.06	4.22	3.88	4.08	4.41	3.98	3.89	4.52	4.21	4.10	4.14	3.99	4.16	4.29
4.83	4.83	4.53	4.90	4.90	4.78	4.73	4.83	4.83	4.80	4.80	4.57	3.75	4.57
4.78	4.78	4.76	4.79	4.80	4.78	4.78	4.78	4.76	4.78	4.78	4.41	3.81	4.65
4.81	4.62	4.81	4.84	4.82	4.75	4.79	4.83	4.81	4.79	4.79	4.32	3.64	4.54
4.91	4.93	4.91	4.92	4.92	4.92	4.90	4.94	4.91	4.93	4.92	4.50	3.87	4.71
3.94	3.83	3.88	4.00	4.02	3.93	3.84	4.28	4.07	3.89	3.98	3.80	4.19	3.79
4.16	3.86	4.11	4.16	4.25	3.98	3.98	4.21	4.06	4.02	4.09	3.87	4.14	3.82
4.42	4.41	4.39	4.40	4.46	4.37	4.41	4.46	4.41	4.44	4.41	4.34	4.03	4.40
4.53	4.49	4.53	4.46	4.57	4.50	4.51	4.57	4.51	4.53	4.52	4.37	4.09	4.45
4.75	4.71	4.74	4.75	4.78	4.62	4.67	4.79	4.70	4.72	4.72	4.52	4.07	4.58
3.01	2.63	2.79	2.55	2.59	2.71	2.63	3.17	2.93	2.70	2.78	3.35	4.14	3.98
4.46	4.24	4.40	4.53	4.59	4.38	4.42	4.50	4.48	4.45	4.44	4.35	3.80	4.20
3.67	3.34	3.34	3.84	4.50	4.17	3.17	5.00	4.17	3.67	3.91	4.00	3.84	4.34



Learning Analytics For Intervention of Students at Risk-Team View



Transcending Concepts



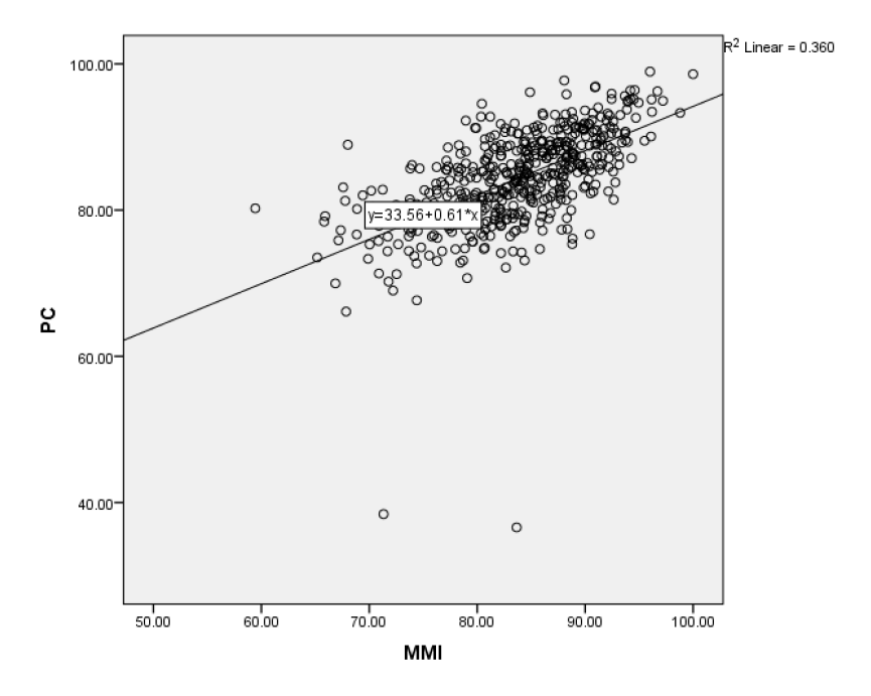
More Examples

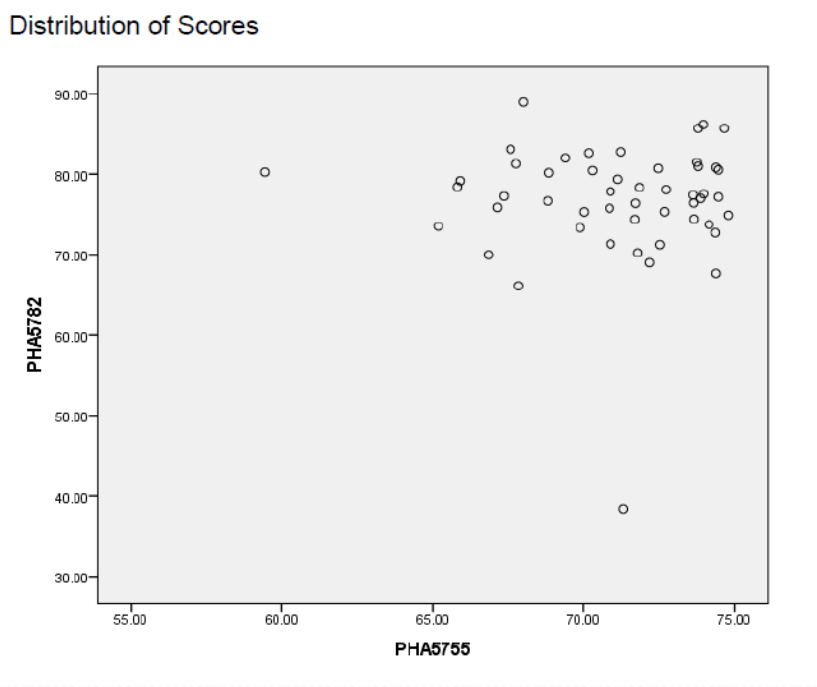
Mining Canvas for Data

Campus	Tea..	Appropriate non-verbal communication skills exhibited (e.g. seated facing the pati..	Introduces self as pharmacist intern from the College of Pharmacy	Responds to patient concerns and questions throughout interview; Offers to follow up a..	Speaks clearly and in a tone and volume understandable by the patient.	*Assess for suspected or documented drug allergies/sensitivities.	Implements interview in an organized fashion.	Assess patient understanding of their medication dosages, frequencies, and rout..	Verifies patient name and correct pronunciation and demographic data.	Clarifies the purpose and structure of the interview.	*Collects a medication history (e.g., prescription, OTC, herbals); documenting..	*Assess patient's actual use of medications.	Explains how patient will benefit from the interview.	Verify the patient's current pharmacy/pharmacies used to fill prescript..	Close the interview by offering to report discrepancies to the pharmacy or physician.	Summarize information gathered from the patient for accuracy and completeness.	Assess for any social/behavior factors that may influence medication use.	Grand Total
JAX	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	80%	100%	100%	98%
	21	100%	100%	100%	100%	100%	100%	100%	60%	100%	100%	100%	100%	100%	100%	100%	100%	98%
	22	100%	100%	100%	100%	100%	100%	83%	100%	100%	83%	100%	83%	83%	100%	100%	50%	93%
	23	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	24	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	100%	100%	100%	100%	100%	80%	98%
	25	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	40%	95%
	26	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	98%
	27	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	99%
	28	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	98%
	Total	100%	100%	100%	100%	100%	100%	98%	96%	100%	96%	100%	98%	96%	98%	98%	74%	97%
ORL	29	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	80%	98%
	30	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	80%	80%	60%	60%	40%	60%	85%
	31	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	100%	100%	83%	100%	100%	60%	96%
	32	100%	100%	100%	100%	100%	100%	100%	100%	80%	100%	80%	80%	80%	80%	60%	80%	90%
	33	100%	100%	100%	100%	83%	100%	100%	100%	100%	100%	83%	100%	83%	83%	83%	33%	91%
	34	100%	100%	100%	100%	100%	100%	100%	100%	80%	100%	100%	80%	80%	80%	80%	80%	93%
	35	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	67%	83%	100%	96%
	36	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	100%	80%	40%	100%	94%
	37	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	100%	67%	50%	67%	83%	91%
	38	100%	100%	100%	100%	100%	100%	80%	100%	100%	100%	80%	100%	80%	60%	60%	100%	91%
	39	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	83%	100%	100%	100%	100%	98%
	40	100%	100%	100%	100%	100%	83%	100%	100%	100%	100%	83%	83%	67%	100%	83%	50%	91%

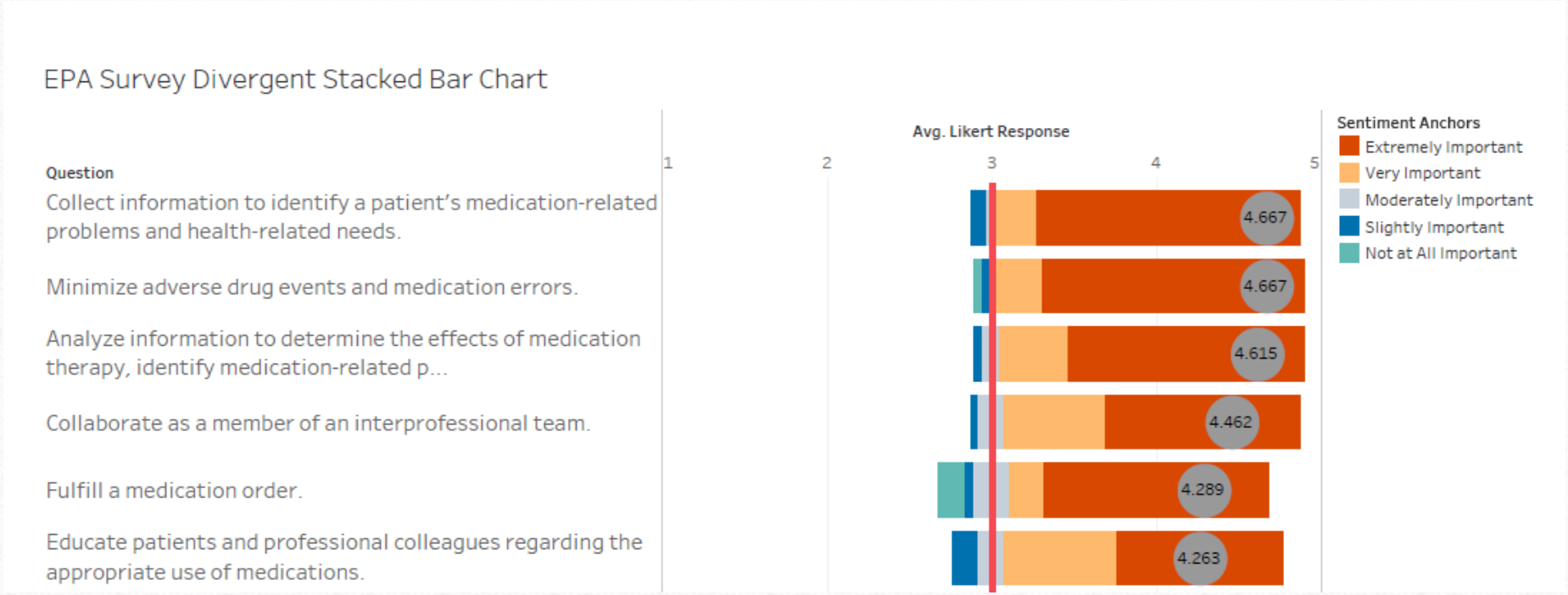
Criterion	Competency Level	Campus						Grand Total	
		GNV		JAX		ORL			
		N	%	N	%	N	%	N	%
Collect: Subjective	Excellent: Complete and concise narrativ..	97.0	86.61%	34.0	73.91%	59.0	81.94%	190.0	82.61%
	Competent: Well-organized and concise ..	15.0	13.39%	11.0	23.91%	12.0	16.67%	38.0	16.52%
	Needs Improvement: Poorly organized a..			1.0	2.17%	1.0	1.39%	2.0	0.87%
	Total	112.0	#####	46.0	#####	72.0	#####	230.0	#####
Collect: Objective (including current medications)	Excellent: Complete and concise summar..	86.0	76.79%	35.0	76.09%	57.0	79.17%	178.0	77.39%
	Competent: Partial but accurate summa..	25.0	22.32%	11.0	23.91%	15.0	20.83%	51.0	22.17%
	Needs Improvement: Poorly organized a..	1.0	0.89%					1.0	0.43%
	Total	112.0	#####	46.0	#####	72.0	#####	230.0	#####
Assess: Assessment of current medical condition(s)	Excellent: Complete prioritized problem..	32.0	28.57%	16.0	34.78%	22.0	30.56%	70.0	30.43%
	Competent: All problems identified but ..	52.0	46.43%	23.0	50.00%	36.0	50.00%	111.0	48.26%
	Needs Improvement: Incomplete assess..	25.0	22.32%	7.0	15.22%	13.0	18.06%	45.0	19.57%
	Not Acceptable: Missing main problem o..	2.0	1.79%			1.0	1.39%	3.0	1.30%
	Total	111.0	99.11%	46.0	#####	72.0	#####	229.0	99.57%
Treatment Plan	Excellent: Specific and appropriate reco..	19.0	16.96%	12.0	26.09%	12.0	16.67%	43.0	18.70%
	Competent: Mostly complete and appro..	66.0	58.93%	27.0	58.70%	49.0	68.06%	142.0	61.74%
	Needs Improvement: Plan is not consist..	19.0	16.96%	6.0	13.04%	10.0	13.89%	35.0	15.22%
	Not Acceptable: Suggested changes may..	7.0	6.25%	1.0	2.17%	1.0	1.39%	9.0	3.91%
	Total	111.0	99.11%	46.0	#####	72.0	#####	229.0	99.57%
Structure	Excellent: All elements of the note are in..	56.0	50.00%	24.0	52.17%	32.0	44.44%	112.0	48.70%
	Competent: Assessment contains plan (i..	50.0	44.64%	19.0	41.30%	31.0	43.06%	100.0	43.48%
	Needs Improvement: Subjective, objecti..	3.0	2.68%	3.0	6.52%	8.0	11.11%	14.0	6.09%
	Not Acceptable: No clear organization to..	3.0	2.68%			1.0	1.39%	4.0	1.74%
	Total	112.0	#####	46.0	#####	72.0	#####	230.0	#####

Curriculum Mapping





Faculty Research



Associate Dean Perspective

- Investment:
  - Staff member with expertise in learning analytics (we already had an Assessment Coordinator position and such a position is required to meet Accreditation Requirements.)

Associate Dean Perspective

- Return on Investment (Examples)
  - Academic Coordinators (3 staff members) no longer need to manually prepare reports.
    - Saved approximately 6 hrs per week of staff time (redeployed their effort to other essential needs)
  - Academic Performance Specialist now has a "useful" report every Monday morning when she checks her email.
    - Assessment Specialist no longer has to manually "push out" this report since it is automated.
  - Curricular reports related to assessment of knowledge, practice skills, soft-skills, professionalism etc are practical and easily interpreted.
    - These reports can be accessed by the Associate Dean anytime a committee or administration wants to know "where we are at"

Ethics and Data as a Commodity

- Guard and house data securely in close consultation with IT
- Develop clear and transparent guidelines for who may access data and how data is to be used

Questions?

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