

Creating Dashboards of Direct and Indirect SLOs Measures in R



**Dr. Chris Boosalis, Dr. Oddmund Myhre, and
Binod Pokhrel, MS ECE**

Introduction

- Development of an assessment system within a College of Education
- Delivering the assessment system campus wide
- Using dashboards to assist in closing the loop
- Server architecture, maintenance, security, and costs

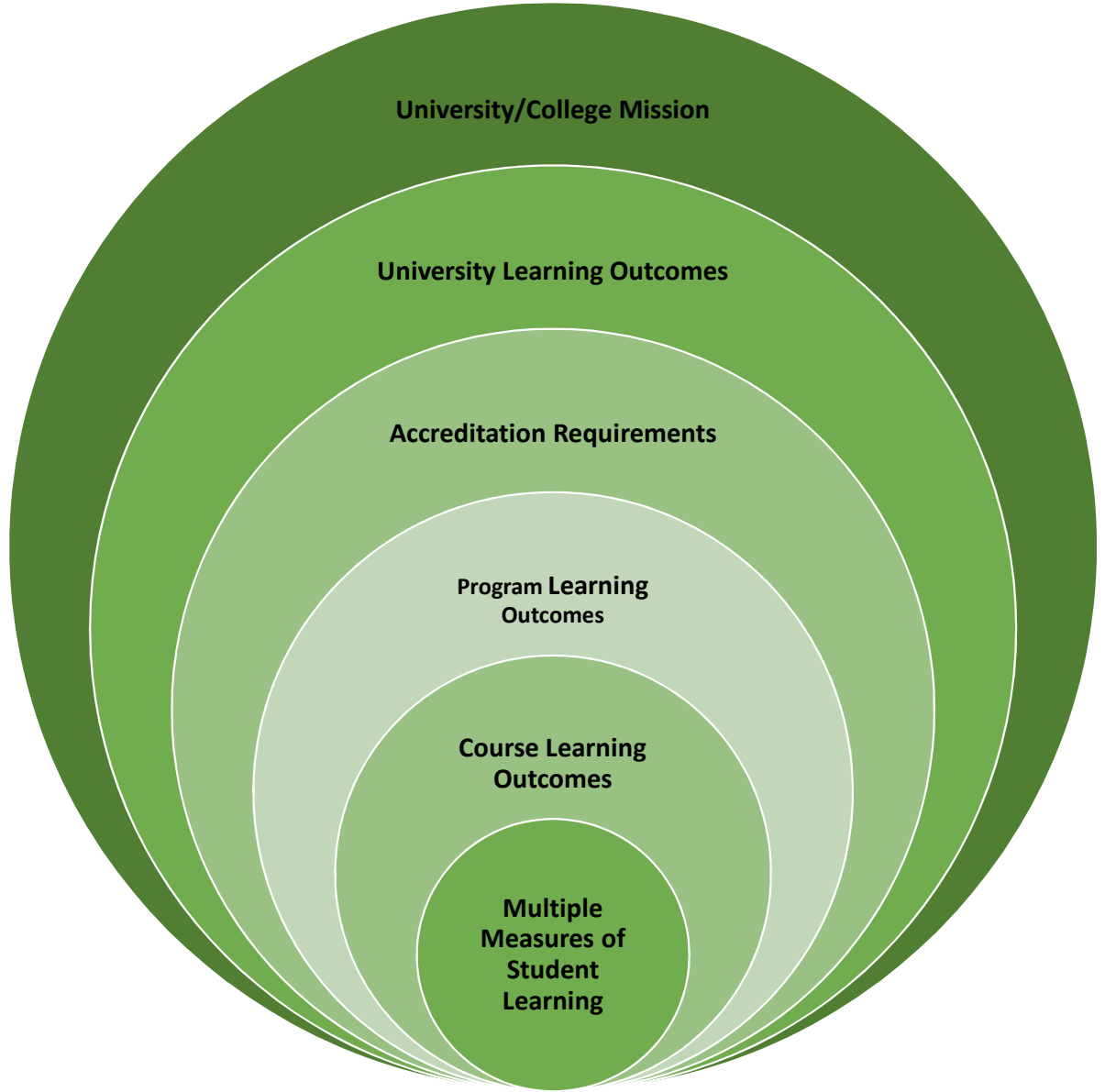
OUTCOMES

How to retain meaning of assessment measures at multiple levels of the organization?

How to track the effects programmatic and curricular changes?

How do we close the loop at regular intervals – not just at accreditation time?

How to use free and open source tools to manage assessment data?



Making Meaning of Multiple Measures



Multiple Measures of Learning Outcomes:

- Employer Surveys
- Student Surveys
- Performance Assessments
- Tests
- Clinical Evaluations
- Direct Assessments



**CLOSING
THE LOOP**

Example



PROFESSIONAL COMPETENCY:

Subject-matter Evaluations

Clinical Evaluations

Course Assignments

Technology Mastery

Ethical Practice

REFLECTIVE LEADERS

Assessment

Data-driven Decision Making

Intellectual Engagement

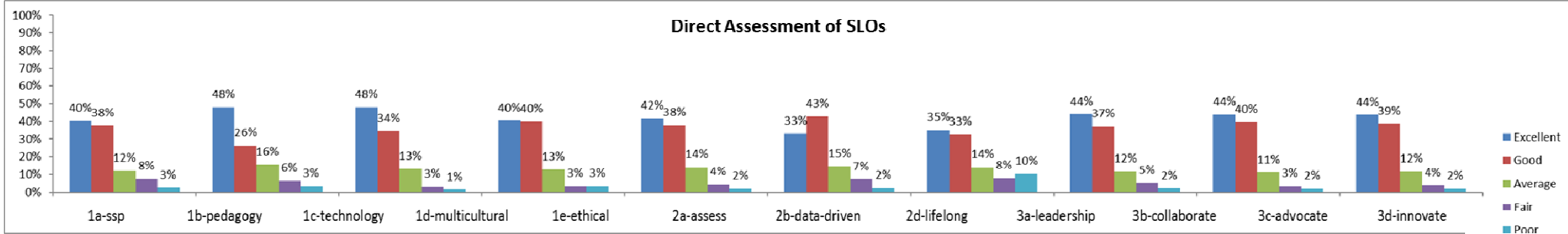
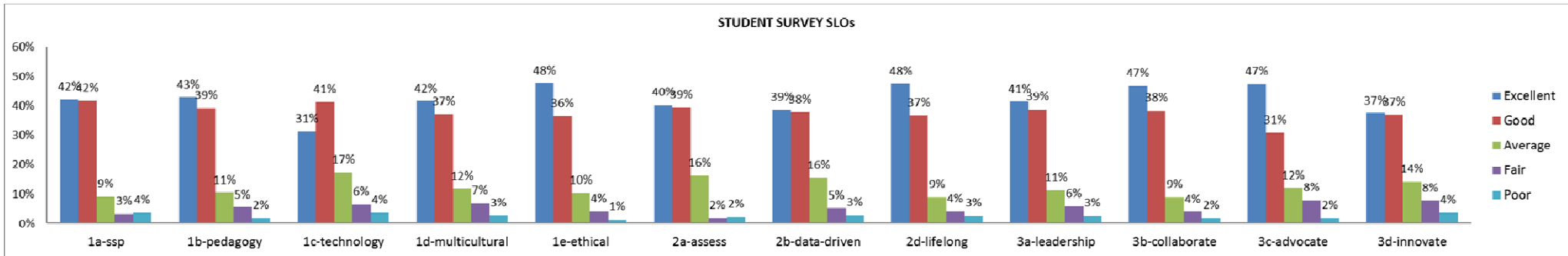
Lifelong Learning



ENGAGED PROFESSIONALS

Leadership
Collaboration
Advocacy
Innovation

STATIC BAR CHARTS



Improved Assessment within a College

Aligning Direct and Indirect Assessments to Student Learning Outcomes

Improved College-Wide Assessment

Table 1

Hypothetical Alignment of Fictitious Program Standards to an SLO

SLO	Elementary	Secondary	Ed Specialist	Nursing	Social Work	Psychologist
Providing essential services to language-minority communities	Differentiating instruction for English learners	Differentiating instruction for English learners	Differentiating instruction for English learners	Culturally responsive health care for diverse linguistic groups	Culturally responsive services for diverse linguistic groups	Culturally responsive therapy for diverse linguistic groups

Table 2

Hypothetical Alignment of Fictitious Program Standards and Fictitious Direct and Indirect Measures

SLO	Program	Program Standard	Direct Measure*	Indirect Measure*
SLO 1: Providing essential services to language-minority communities	Elementary	Differentiating instruction for English learners	Teaching Performance Assessment, Rubric Element 10	Student Exit Survey, Question 13
	Secondary	Differentiating instruction for English learners	Teaching Performance Assessment, Rubric Element 10	Student Exit Survey, Question 13
	Ed Specialist	Differentiating instruction for English learners	Teaching Performance Assessment, Rubric Element 10	Student Exit Survey, Question 13
	Nursing	Culturally responsive health care for diverse linguistic groups	Clinical Assessment, Rubric Element 12	Program Exit Survey, Question 22
	Social Work	Culturally responsive services for diverse linguistic groups	Clinical Assessment, Rubric Element 13	Clinical Exit Survey, Question 23
	Psychologist	Culturally responsive therapy for diverse linguistic groups	Field Experience Assessment, Rubric Element 14	Field Experience Survey, Question 24

CoE Learning Outcomes

This example reflects a Student Learning Outcome viewer for five learning outcomes from three different programs. Select an outcome, select or deselect various programs, and then click the play button. You can also select specific programs on the chart and experiment rolling over content on the chart and enabling trails. Don't forget to click the play button on the motion chart and to toggle between the line chart and bar graphs (top of the motion chart), too.

Select SLO

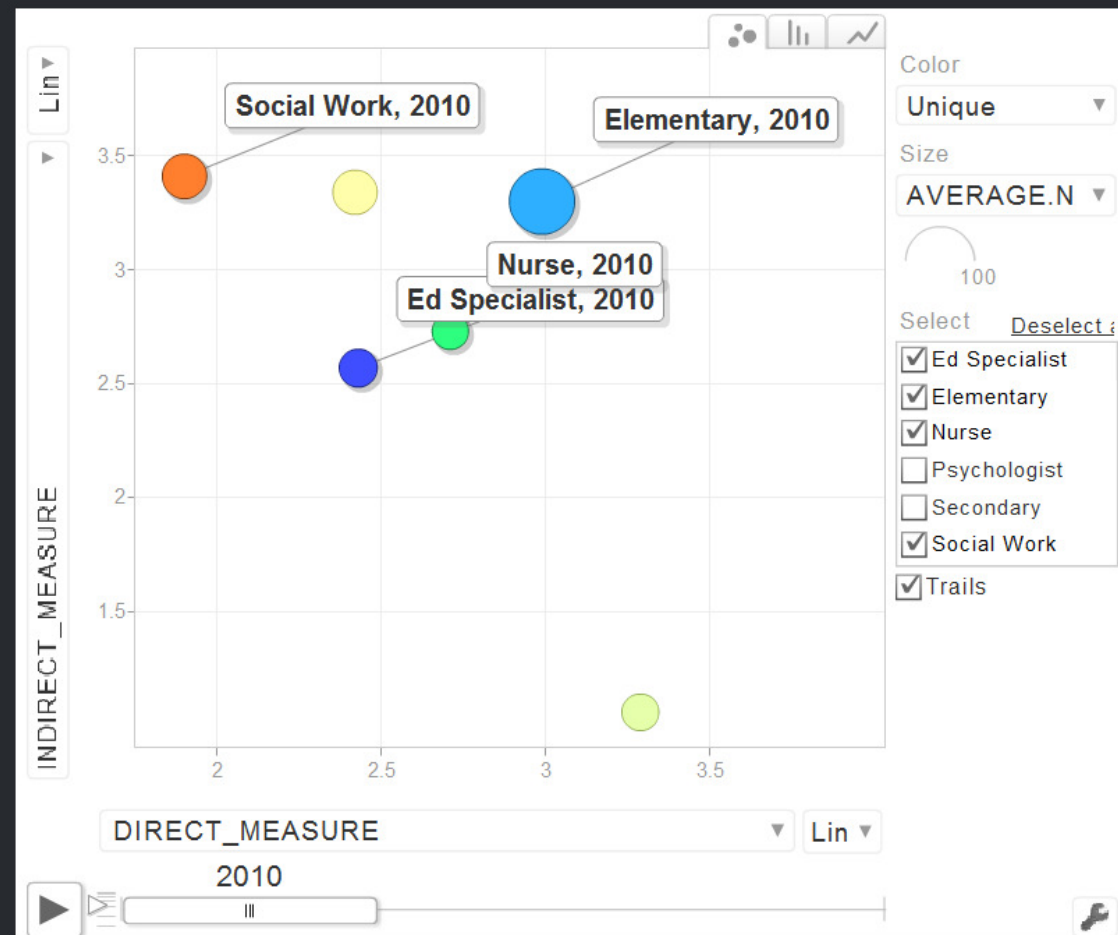
- 1. Advocate for Children & Families
- 2. Equity and Social Justice
- 3. Active Civic Engagement
- 4. Collaboration and Communication
- 5. Human Capital

Select Department

- Teacher Education
- Health Professionals
- Leadership

College of Education credential programs collect a great deal of student data about student performance. While the data are

College of Education



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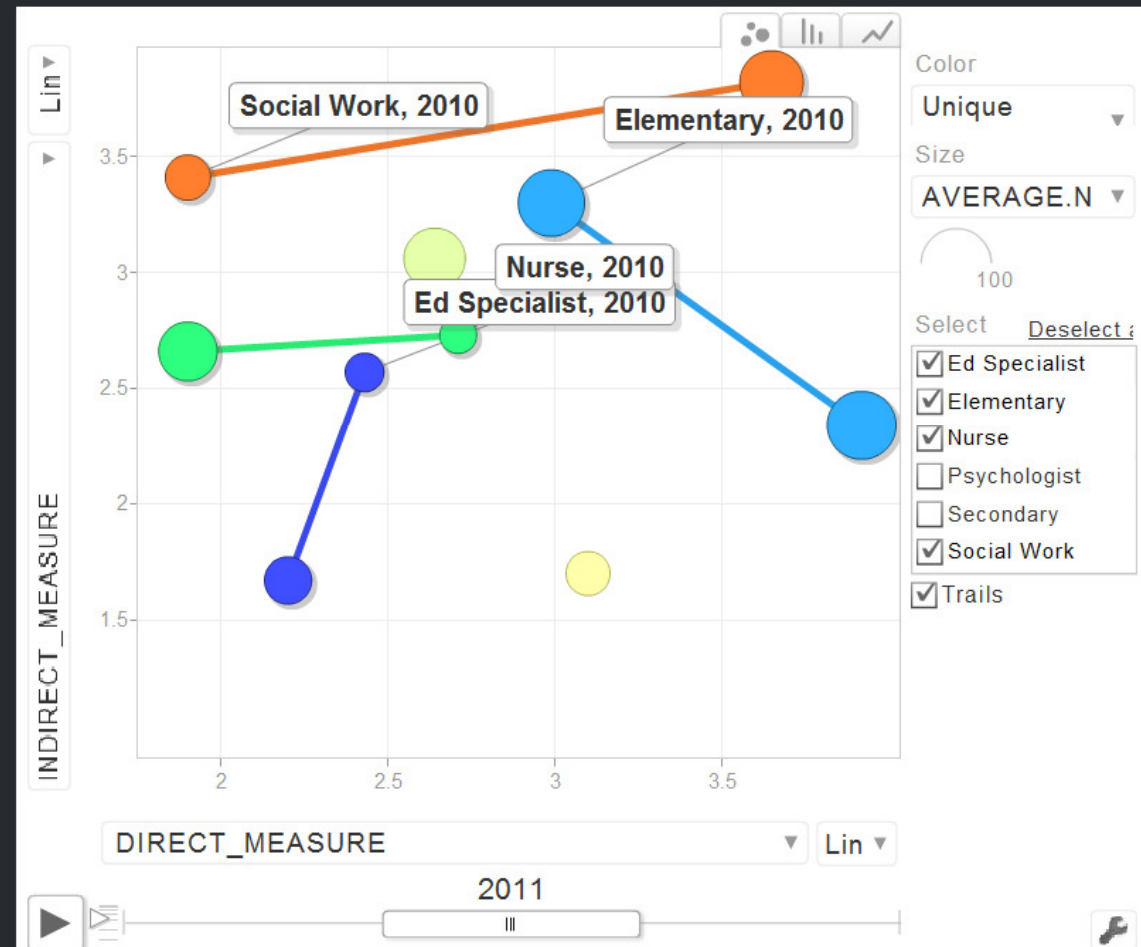
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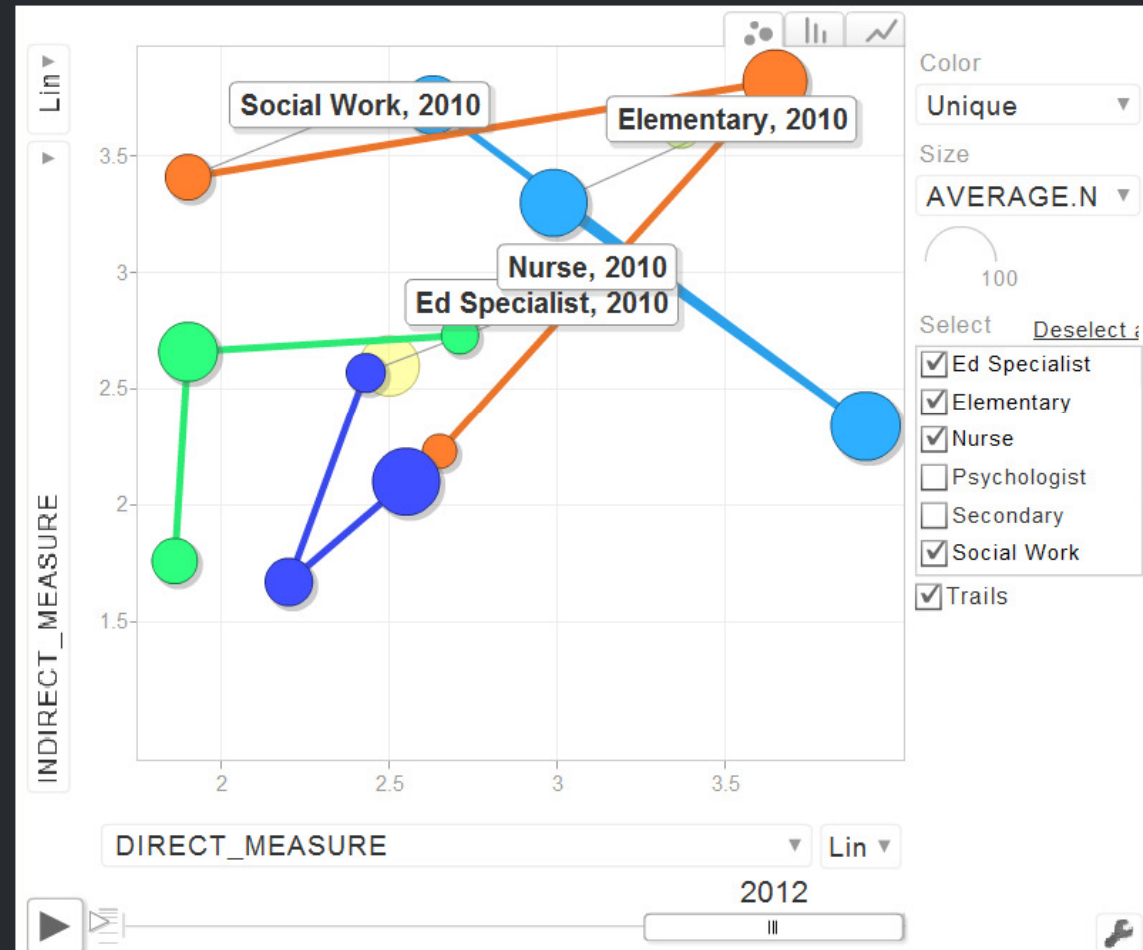
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Scaling up to University-wide Assessment

Aligning Direct and Indirect Assessments to Student Learning Outcomes

HYPOTHETICAL ALIGNMENT OF FICTITIOUS PROGRAM ASSESSMENTS TO AN SLO ACROSS MAJORS

SLO	English	Foreign Language	Biological Sciences
Demonstrate critical thinking, including the ability to evaluate, analyze, and integrate information from a variety of sources.	Appraise the use of symbol and metaphor used in the stage and film adaptations of an historical works of fiction.	Contrast the positions taken in a news articles on world events from English and Spanish media using the target language.	Evaluate an article on modern day epigenetics and its allusions to the theories of Jean-Baptiste Lamarck.
	Statistics	Education	Psychology
	Assess the benefits and detriments of propensity score matching to equate groups in sociological studies.	Evaluate grade-level texts for cultural bias, appropriate semantics, syntax, morphology, and theme.	Critique the use of culturally-responsive therapy methods for diverse linguistic and ethnic groups.

Learning Outcomes across University Programs

Like the Student Learning Outcome dashboard for the College of Education, this example shows how the approach can easily scale and accommodate a university-wide endeavor.

Select SLO

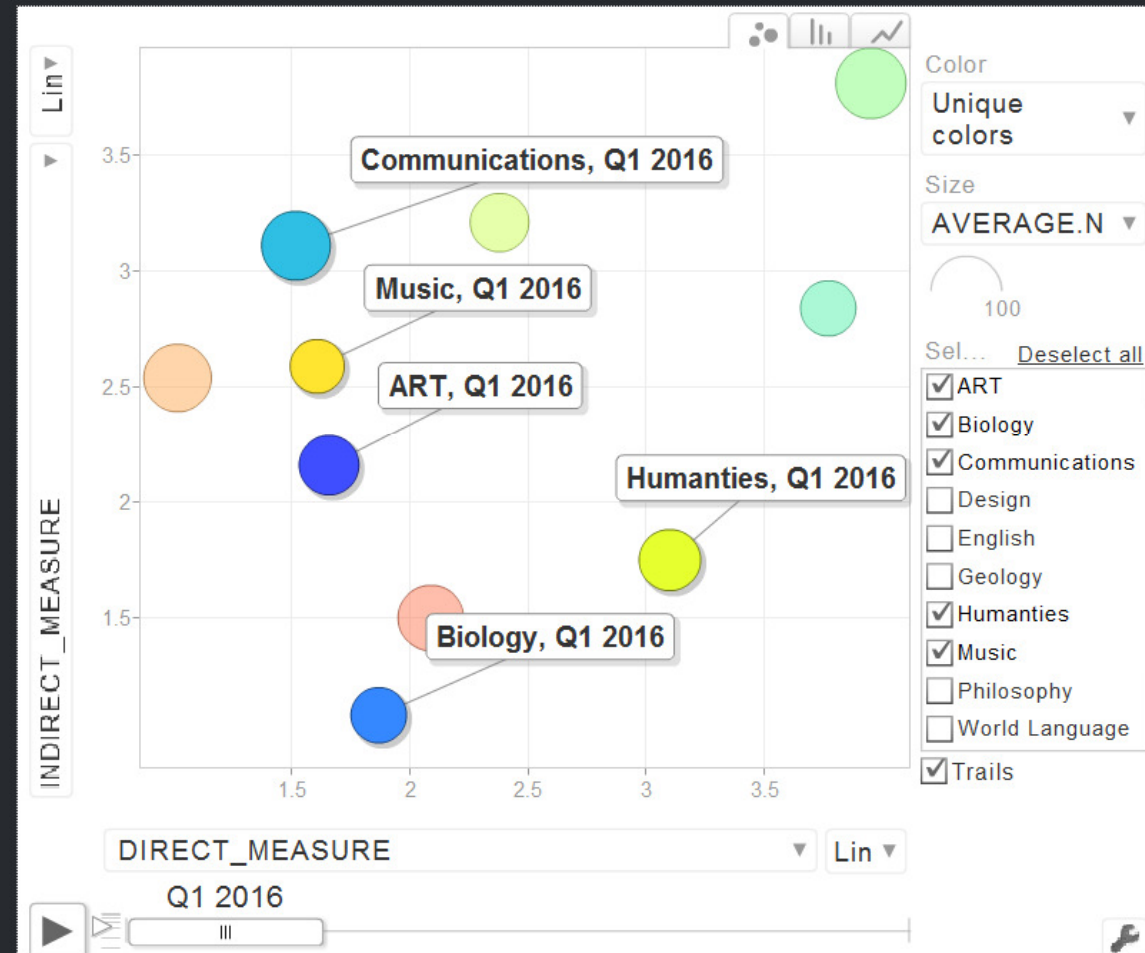
- 1. Critical Analysis
- 2. Integrative Thinking
- 3. Effective Communication to K-14 Stakeholders
- 4. Understanding Professional Role
- 5. Practical Applications

Select College

- Education
- Arts and Letters
- Natural Sciences
- Continuing Education
- Mathematics
- Computer Science

Chris Nicholas Boosalis - <https://github.com/cboosalis>

A Plot of Graduate Programs



Learning Outcomes across University Programs

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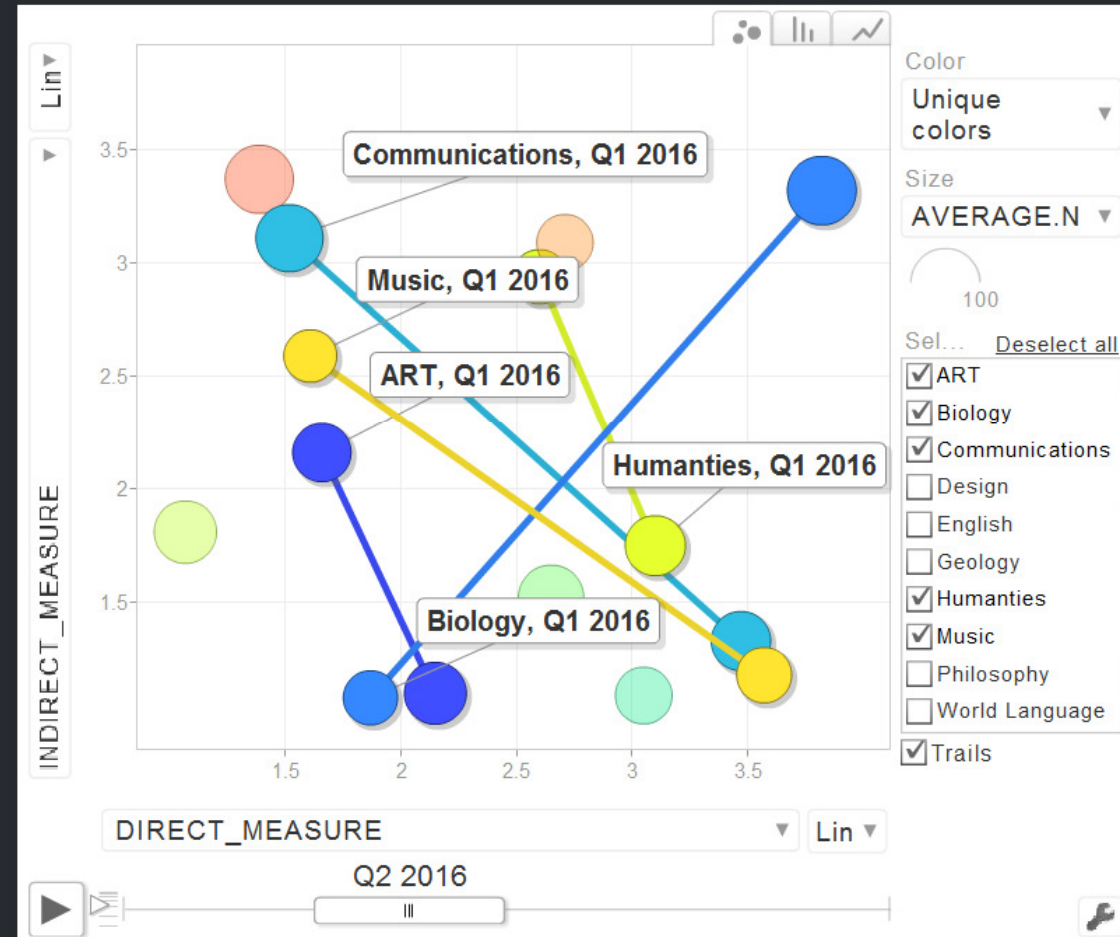
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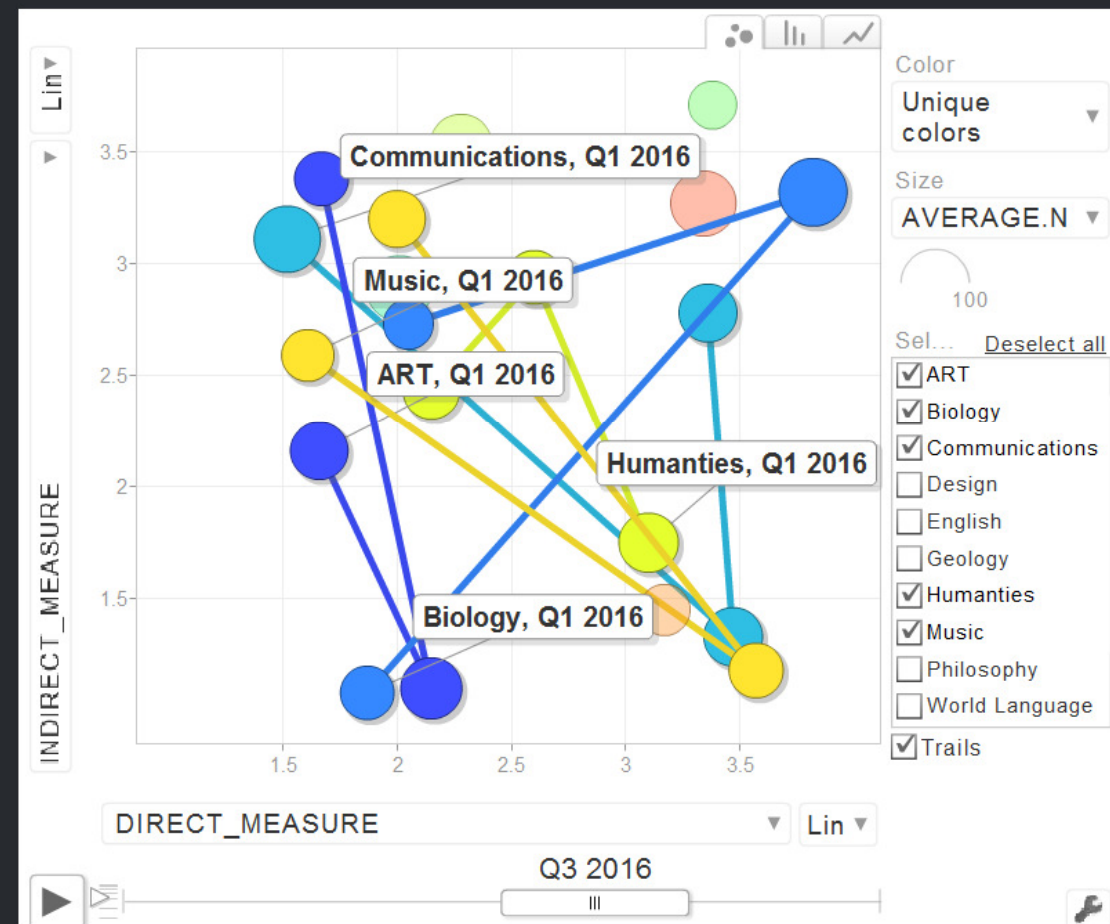
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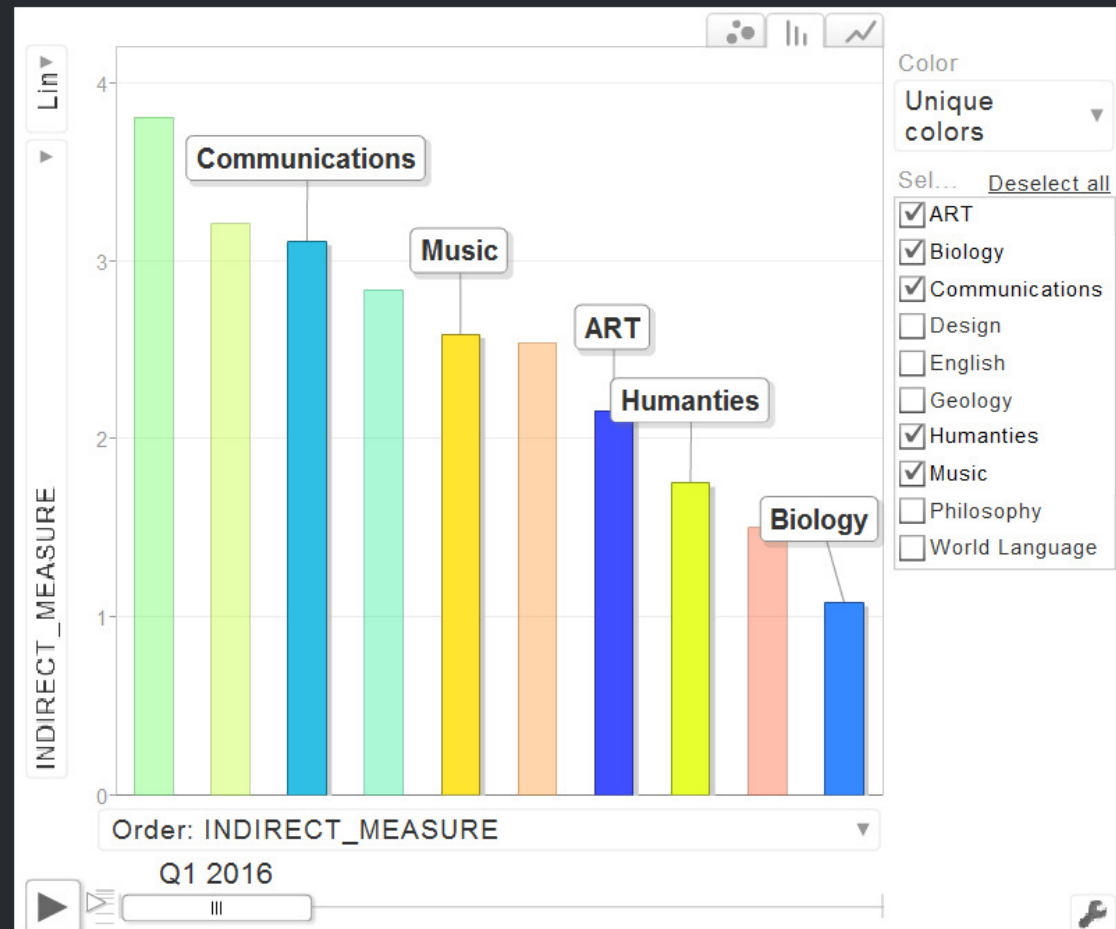
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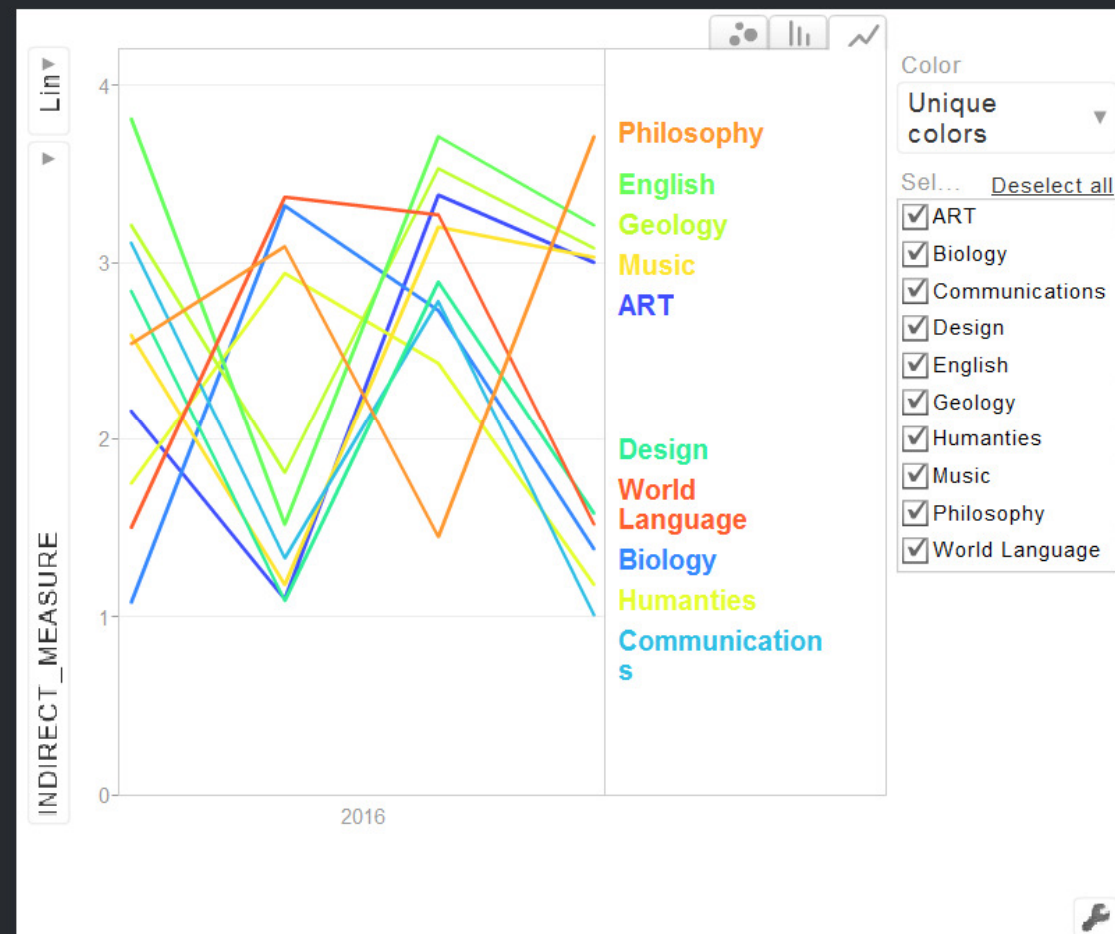
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A Plot of Graduate Programs



Shiny Server

System

Ubuntu 14.04 LTS 64 bit OS

All updates installed

Ubuntu Package for R, Rbase

Curl and CRAN Repository

All dependencies

Shiny

GoogleVis



Operational and maintenance cost

Internal Server

Skilled IT – Minimal running cost

Minimal Hardware requirement

External Support - \$ 200 - \$1500 / Year for the server side (Ubuntu)

<https://www.ubuntu.com/support/plans-and-pricing>

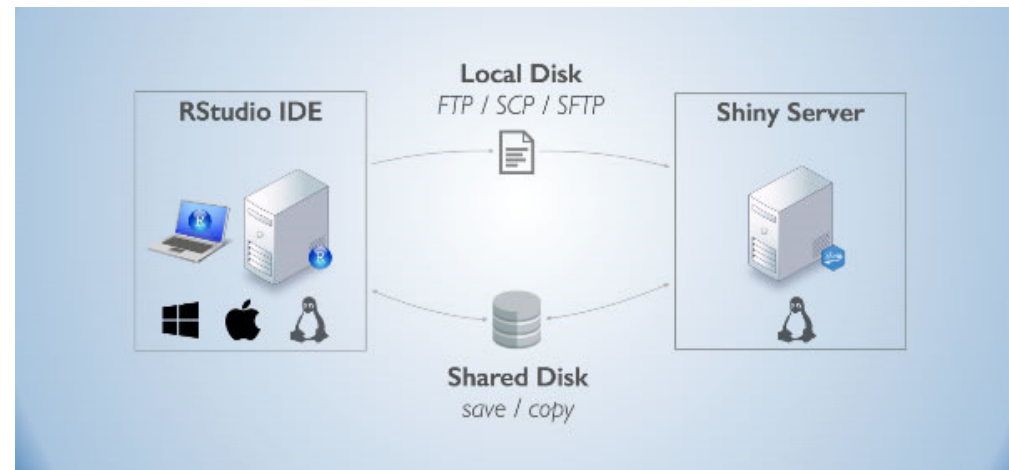
Vendor

-E.g. Digital Ocean (Monthly recurring cost)

<http://deanattali.com/2015/05/09/setup-rstudio-shiny-server-digital-ocean/#sign-up>

Deployment and Server security

- Physically Transfer
- Shared Disk
- SFTP



Security – Firewall
Proper Authentication
Regular Log checks

Fusion Registry and R

Fusion Registry – Chris and Matt Nelson (UK)

The screenshot shows the Fusion Registry web application interface. At the top left is the Fusion Registry logo and name. On the right, there is a language dropdown set to 'en' and a green 'Login' button. A dark sidebar on the left contains a navigation menu with the following items: Home, Organisations, Data, Items, Metadata, Structure Maps, Web Service, Export Structures, Excel Reports, and Search. The main content area features the title 'Fusion Registry' and 'Version 9.0.15'. Below this, three main functional areas are presented: 'Convert or Publish' (with a tablet icon), 'Data Registration' (with a globe icon), and 'Browse Data' (with a bar chart icon). Each area includes a brief description of its function.

Fusion Registry
Version 9.0.15

Convert or Publish
Load Data to Validate, Transform, Tabulate, and Publish to the Fusion Registry

Data Registration
Register external data files or web services. Publish Data directly to the Fusion Registry data store, and manage previously reported Datasets

Browse Data
Browse all the Data that has been made available to the Fusion Registry

Slice and Dice



Fusion Registry

Home | Web Service

en ▼

Dataset Filters



All Data Sets

Category

Concept

Filter By Concept

- Assessment
- Program
- Program Type
- Slos
- Time Period



Download the FusionXL plugin for Microsoft Excel which provides a data browser for this service on the Excel ribbon.

FusionXL is free to download and use, no installation is required. [More Information](#)

Assessment

250 series

Program Type

Program

Slos

Assessment

Time Period

Source: (CoE) at Sacramento State

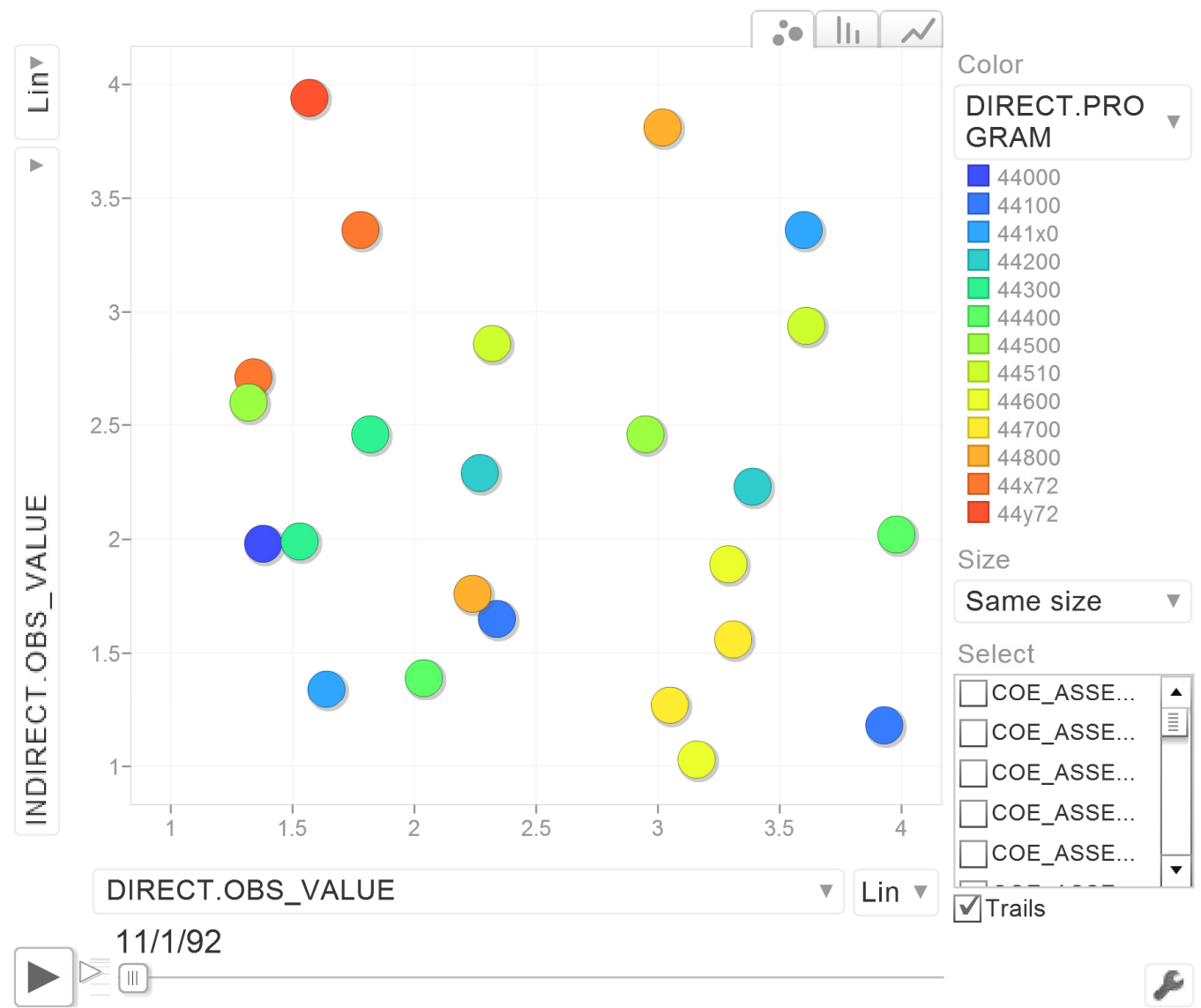
Query Dataset

SDMX Data – 23,000 Records Parsed

Chart Type:   

Assessment

Assessment >		Direct					
Program Type >		Bilingual Program			Traditional Program		
Slos >		SLO1	SLO2	SLO3	SLO1	SLO2	SLO3
Program ▾	Time Period ▾						
Credential Programs	2009-12	1.92	1.52	1.92	3.2	1.43	1.92
	2010-01	1.41	3.06	3.77	3.17	3.82	3.06
	2010-02	1.92	1.69	3.6	1.1	1.81	1.92
	2010-03	3.78	3.23	3.51	2.53	2.75	3.78
	2010-04	3.86	1.8	3.87	3.31	3.08	3.86
	2010-05	3.25	1.36	1.45	3.2	2.5	3.25
	2010-06	3.11	2.86	1.01	1.76	3.94	3.11
	2010-07	3.8	1.67	1.28	2.3	2.44	3.8
	2010-08	2.75	1.77	2.97	1.59	3.54	2.75
	2010-09	3.66	2.61	2.84	3.36	1.6	3.66
	2010-11	2.65	1.62	3.59	3.36	2.41	2.65
	2010-12	1.37	3.29	2.6	2.33	2.36	1.37
	2009-12	2.92	3.85	2.54	2.98	2.49	2.92
2010-01	2.04	3.84	3.07	3.01	3.77	2.04	



Fusion Registry to R -- Chris B. says, 'Matt - Thank you!'

Public Data

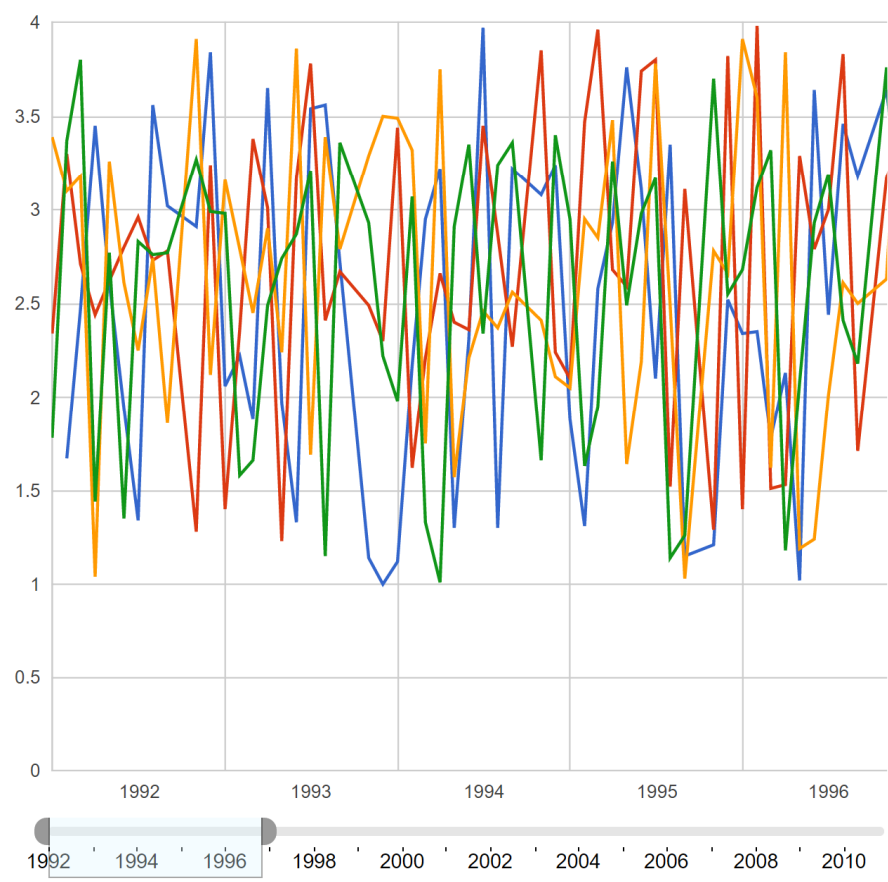
Teaching Performance Expectations
Direct Measure
Indirect Measure

Compare by College Program
Select College Program

- ▼ **TPE 1: Engaging and Supporting All Students**
 - 1.1 Apply knowledge of students to engage them in learning.
 - 1.2 Maintain ongoing communication with students and families.
 - 1.3 Connect subject matter to real-life contexts.
 - 1.4 Use appropriate instructional strategies.
 - 1.5 Promote students' critical and creative thinking.
 - 1.6 Provide a supportive learning environment.
 - 1.7 Provide students... to access... visual resources.
 - 1.8 Monitor student learning and adjust instruction.
- ▼ **TPE 2: Creating and Maintaining Effective Learning Environments**
 - 2.3 Establish, maintain, and monitor instructional environments.
 - 2.4 Know how to access resources to support learning.
 - 2.1 Promote students' social-emotional learning.
 - 2.2 Create learning environments that support learning.

Credential Program Multiple Subjects
Program Type Traditional Program

Direct Measure - Traditional Program - Multiple Subjects ?



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