HUDK 4050: CORE METHODS IN EDM

9/24/19 3:49 PM

Today

- Data Wrangling Part II

- Ethics stuff we didn’t get to last week

Events

Title	Date - Time	Location
Careers in Data Science in Ed	09/25 - 3:00pm	Everett Lounge
AWS: A Simplified Approach to Data Driven Research	09/30 - 9:00am	Webinar
Aligning Learning Analytics with Classroom Needs	10/01 - 12:00pm	NYU Kimmel 405
Columbia Curricular Innovation Fellows Info Session	10/01 - 12:00 10/03 - 4:00	Butler 203 Butler 523
Formal & Informal LA (lunch)	10/4 - 11:00am	GDH 449
Cornell Tech: Day of Data	10/15	Cornell Tech

EdSurge

News

Who Should Truly Have the Power in K-12 Edtech Adoption?

NewSchools Venture Fund and Gallup Release Survey Findings About Ed Tech Usage in U.S. PreK-12 Schools

newschools venture fund

THE JOURNAL

Grant to Fund More Research into Ed Tech Best Practices

PROPUBLICA

Millions of Americans' Medical Images and Data Are Available on the Internet. Anyone Can Take a Peek.

Wrangling Recap

- Tidy data
- Tidyverse (dplyr & tidyr)
- Wide/Long Format
- Messiness
- Subset/Variable Generation/Combine/Summarize
- Reshape: gather, spread
- Class Activity 1: answers available on Github

Data Wrangling II

Dataframes & Matrices

Matrix vs. Data Frame

Matrix

- Uses less memory
- Operations are faster
- Requires same data type (character or numeric)
- Useful for matrix algebra

Data Frame

- Convenient
- Intuitive
- Can have different data types in one format
- Useful for referring to columns individually

Create Matrix

- `matrix()`
- `as.matrix()`

Other Useful Operations

Transpose Function

- `t()`
- Transposes a matrix or data frame
- rows ⟶ columns, columns ⟶ rows
- Output = matrix

Diagonal Function

- `diag()`

- Replace or extract the diagonal of a matrix

Matrix Multiplication

- %*%
- Two matrices must be the same size
- Multiplies the rows of the first matrix by the columns of the second
- Multiplies two matrices together
- Will become useful when we get to Social Network analysis

Activity

- Create a data frame called **A** of three variables, each having three values

- Convert the data frame to a matrix called **B**

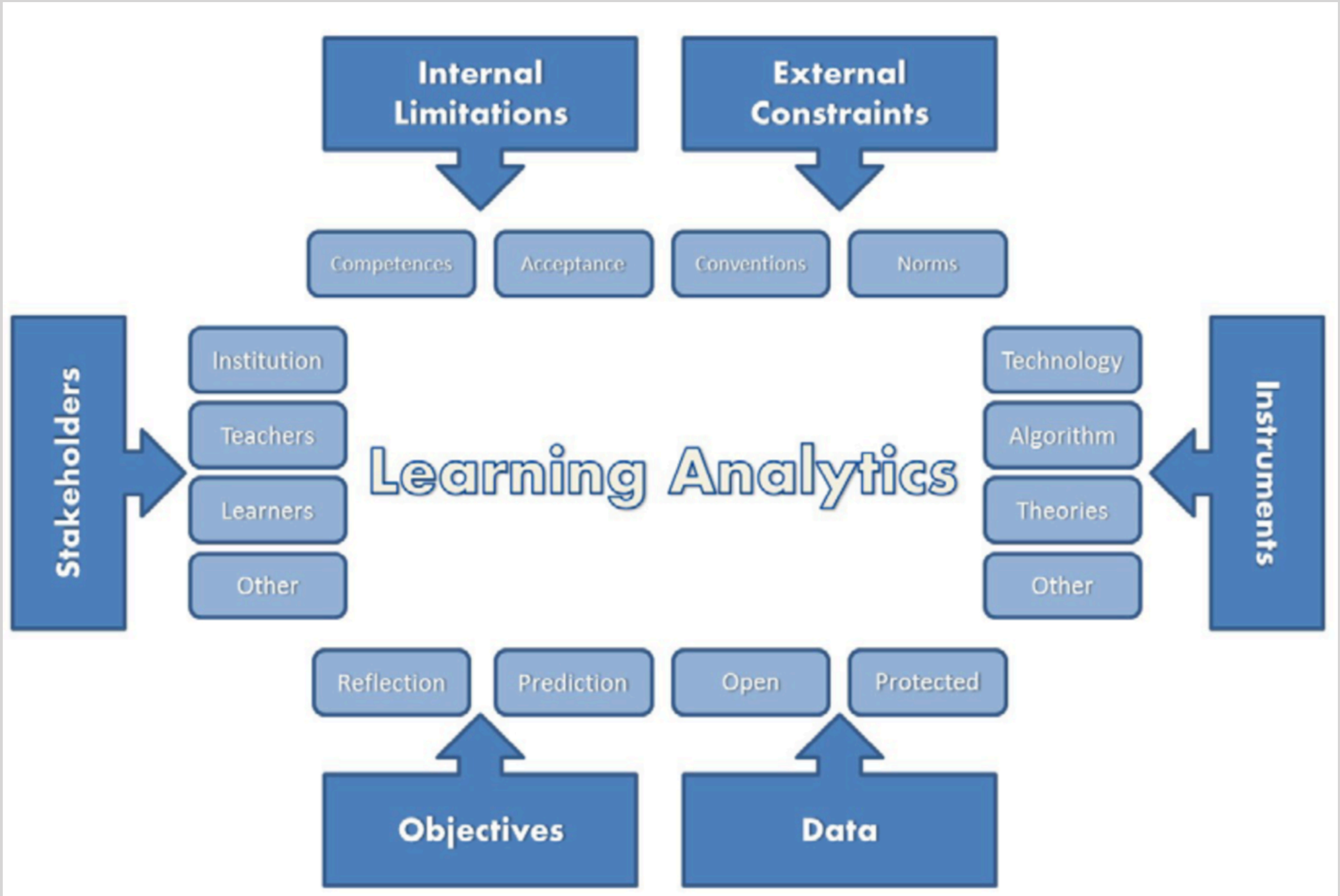
- Create a matrix called **C** that is the transposition of **A**

- Create a matrix called **D** that is the multiplication of **C** and **B**

- Replace the diagonal values in **D** with missing values

Translating Learning Into Numbers

Greller & Draschler (2012)



Exercise 2

- Consider the fake data you generated and the diagram on page 44 of Greller & Draschler
- Work your way through each of the boxes
- Which would pose problems for you to actually acquire the data you want?
- Write a note summarizing the article in Zotero, include thoughts based on your answers to the above

Code of Ethics

- There have been several Learning Analytics Codes of Ethics drawn up for institutions:
  - Open University
  - JISC
  - American Library Association
  - Data for Good

D — **DETERMINATION** – Why you want to apply Learning Analytics?
- What is the added value (Organisational and data subjects)?
- What are the rights of the data subjects (e.g., EU Directive 95/46/EC)

E — **EXPLAIN** – Be open about your intentions and objectives
- What data will be collected for which purpose?
- How long will this data be stored?
- Who has access to the data?

L — **LEGITIMATE** – Why you are allowed to have the data?
- Which data sources you have already (aren't they enough)?
- Why are you allowed to collect additional data?

I — **INVOLVE** – Involve all stakeholders and the data subjects
- Be open about privacy concerns (of data subjects)
- Provide access to the personal data collected (about the data subjects)
- Training and qualification of staff

C — **CONSENT** – Make a contract with the data subjects
- Ask for a consent from the data subjects before the data collection
- Define clear and understandable consent questions (Yes / No options)
- Offer the possibility to opt-out of the data collection without consequences

A — **ANONYMISE** – Make the individual not retrievable
- Anonymise the data as far as possible
- Aggregate data to generate abstract metadata models (Those do not fall under EU Directive 95/46/EC)

T — **TECHNICAL** – Procedures to guarantee privacy
- Monitor regularly who has access to the data
- If the analytics change, update the privacy regulations (new consent needed)
- Make sure the data storage fulfills international security standards

E — **EXTERNAL** – If you work with external providers
- Make sure they also fulfil the national and organisational rules
- Sign a contract that clearly states responsibilities for data security
- Data should only be used for the intended services and no other purposes

Draschler & Greller, 2016

Code of Ethics

bit.ly/HUDK4050COE

Exercise 3

- Read over the code
- Does it seem reasonable?
- Is there anything missing?
- Do you believe it is useful?

Anonymous Code of Ethics Survey

http://bit.ly/2w3GR51