Data Visualization and Learning Analytics in an RPP context

Fabio Campos (PMR2 | NYU) @ NNERP 2019
The plan:

1. A glimpse at the PMR2 project and respective RPPs.
2. Understanding potential representations of data.
4. New ways of representing RPP data.
5. Mini-workshop
My Timeline (so far)

1997 - 2000: UFRJ

1998 - 2012: Oi

2010 - 2012: Teach For All

2013: NYU

2014 - 2016: RIO Prefeitura

2017: S

2018 - ???

fabio
Learning Sciences & Technology Ed.
Advised by June Ahn (@UCI)
Improvement Science
https://www.carnegiefoundation.org
Practical Measures, Routines and Representations
PMR2 in a nutshell

**PRACTICAL MEASURES**
- Whole Class Discussion
- Small Group Discussion
- Launch of the task
- Rigor of the task

**ASSOCIATED ROUTINES**
- Coaching cycles
- Data collection
- Data analysis and reflection
- Negotiating Improvement Goals

**DATA REPRESENTATIONS**
- Edsight: a suite of visual learning analytics tools to represent measures and support routines.

Math!
Our suite of measures

Small Group Discussion
Students' experiences with key aspects of discussion during small group work. [2-3min survey].

Whole Class Discussion
Students' experiences with key aspects of discussion during small group work. [2-3min survey].

Launch of a Task
Students’ experiences with teacher’s introduction to a mathematical task. [1min reaction survey.]

Rigor of the Task
Used by a coach with a teacher to discuss the rigor of the task selected for a lesson. [coming soon]

Download them here
https://www.pmr2.org
Data
Data
Data
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Data
Data
Dashboards
Dashboards
Dashboards
How can a dashboard of learning data produce change?
Theory of Action of Learning Dashboards

1. Learning activity happens
2. Dashboard = “Perceiving Learning at a Glance”
3. Insight
4. Action / Change
Moving from Open Data to Open Knowledge: Announcing the Commerce Data Usability Project

January 29, 2016, by Jeffrey Choate, Tyrone Cravens, and Kaitlin Henry

Opening an government to better serve the American people has been a key priority of this Administration from day one. On his first full day in office, President Obama signed the Memorandum on Transparency and Open Government ushering in a new era of open and accountable government. Since then, the Administration has continued to take unprecedented steps to make government more efficient and effective, including launching Data.gov, establishing the International Open Government Partnership, and signing an Executive Order on Making Open and Machine Readable the New Default for Government Information. And under the Administration’s direction, Federal agencies are developing and implementing their own open-government efforts.

The U.S. Department of Commerce (DOC), for instance, is an example of a Federal agency leading the charge on using open data to create real-world value. In just the past year, for instance, DOC established the Commerce Data Advisory Council, a group of up to 30 experts nominated helping to optimize the beneficial use of the full range of data that the DOC distributes, and the Commerce Data Service, a multi-government start-up team forming partnerships with the national bureaus that make up the DOC to deliver products and services to help government agencies.

And in 2016, the DOC is committed to building on this momentum with new and expanded efforts to transform open data into knowledge into action.

DATA → KNOWLEDGE → ACTION

Graphic Credit: Rashika Shetti, Commerce Data Service

DOC has been in the
But

a.k.a “The Caveat Game”
{revisiting the} Theory of Action of Learning Dashboards

Learning activity happens

Dashboard = “Perceiving Learning at a Glance”

Insight

Action / Change
{revisiting the} Theory of Action of Learning Dashboards

Learning activity happens

What about off-line learning?

Dashboard = “Perceiving Learning at a Glance”

Insight

Action / Change
HCI is not enough

Learning activity happens

Dashboard = “Perceiving Learning at a Glance”

Insight

Action / Change

Learning Theories
Pedagogy / Epistemology
HCI is not enough

Learning activity happens

Dashboard = "Perceiving Learning at a Glance"

Insight

Conditions of Use, Micropolitics Beliefs & Previous knowledge

Action / Change
HCI is not enough

Learning activity happens

Dashboard = “Perceiving Learning at a Glance”

Insight

Limited memory about events

Action / Change
Limited research about Data Sense-making in schools and districts

Learning activity happens

What about off-line learning?

Dashboard = "Perceiving Learning at a Glance"

Insight

Limited memory about events

Learning Theories
Pedagogy / Epistemology

Conditions of Use, Micropolitics
Beliefs & Previous knowledge

Action / Change

?
You broke my toy.

Now give me something to play with.
Infusing dashboards with ancillary data

Perhaps we should ask the user what he thinks.
Infusing platforms with multiple forms of data

- Ideas
- Dashboard
- Collaboration
- Notes and Artifacts
- Dialogue
Infusing (storyboards?) with multiple forms of data

How do you decide what to and how to show? Where’s the silver bullet?
Covering the design front

PARTNERSHIP INITIATION
- Initial RPP&IS needs negotiated
- Low-fi prototypes created
- Practical Measures prototyped together with the dashboard
- Prototypes modified within partnership team

RPP & IS LOOP
- "In the wild" user testing
- Experience Mapping
- "In the lab" user testing
- Think Alouds and interviews
- Co-design sessions
- Measures being validated

HCD LOOP
- "In the lab" user testing
- Co-design sessions
- Measures being validated

District "Buy-in" Meetings
- RPP Summer Summit
- RPP Weekly Forum

For teachers
Exemple:
Automated reflection and the Rx effect

**Question 1**
What did you need to do in order to be successful in your math class today?

- Solve problems using the steps the teacher showed me
- Listen to and make sense of other students’ reasoning
- Finish all of my work

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<td>Finish all</td>
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**Question 4**
How comfortable were you sharing your thinking in the whole class today?

- Not comfortable
- Somewhat comfortable
- Very comfortable

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32% 42% 45%
Exemple:
Fighting memory limitations (with a very simple tool).

For this particular session I plan to conduct a longer whole class discussion of around 15 minutes. I aim to have kids talking about potential misconceptions related to negative numbers. Given the last couple's surveys, I need to foster more peer learning and show-and-tell. Kids should be the one doing the talk, not me. For that reason, I predict a better result on the "who talked the most" question.

28 Nov 2017, 03:42:05 PST
It's interesting that some students did not even acknowledge that we had a whole class discussion. I wonder if some of them do not see this part of the class as something different and / or detached from the other moments. If that is the case, they will not feel compelled to talk, leaving all the work to me!

12 Dec 2017, 03:42:05 PST
I returned to this survey and noted that many students say they are not quite comfortable in sharing their own visions and ideas. I still need to think about what to do in order to make them more relaxed and talking.

29 Nov 2017, 03:42:05 PST
Saw a spike in students' comfort in Nov 23rd. Need to investigate what caused this. Not sure if my instruction or the task itself. Maybe a combination of both. Anyways, that's what I am looking for. Maybe a quick chat with my coach with clear my mind a little bit.
For coaches
For coaches
For coaches
For coaches
For coaches
Asking annoying questions.

Especially in the contexto of RPPs
What decisions do you expect to make by knowing this data?
What decisions do you expect to make by knowing this data?
Let’s think together.
A design checklist

1. What type of information does your RPP use to make decisions at the school level?
2. What decisions do you expect to make based on #1?
3. What information is “central” and what is “ancillary”? Why?
4. How is this information usually represented?
5. Who generates the information? What is the trigger?
6. Who consumes it? When / Trigger?
7. What conditions of use (of data) can you map?
8. Which routines are mapped into your data cycle?
9. Which pedagogical and epistemological beliefs are embedded in your data system (i.e. what does learning and knowing means)?
Insights?
An invitation
Share insights about reflection cards and storyboards (25-30min, via Zoom).

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