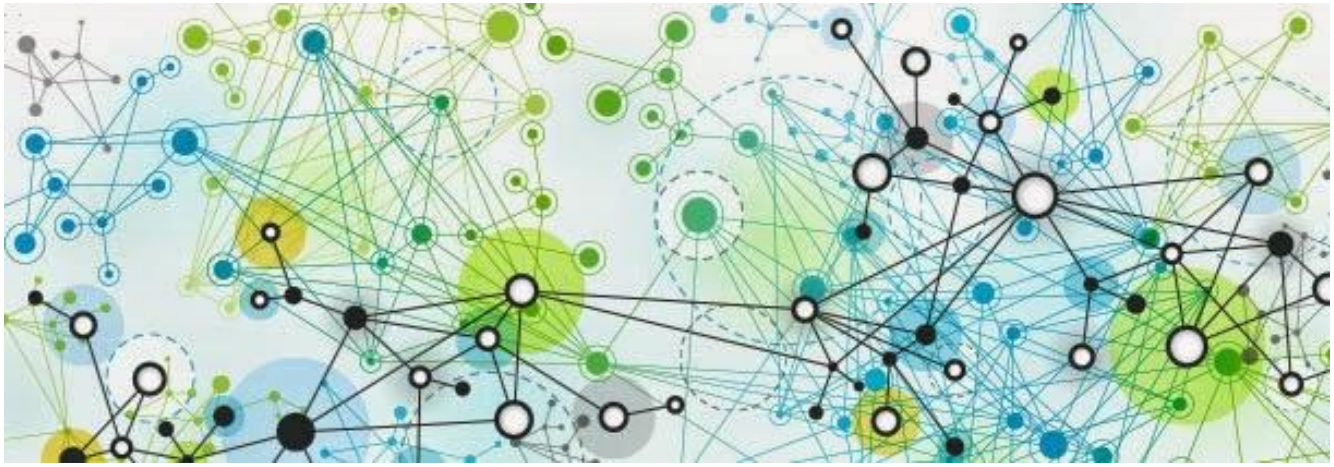
IT Rep Meeting – April 23rd, 2015



Learning Analytics in Education: Using Student's Big Data to Improve Teaching

Rafael Scapin, Ph.D.
Coordinator of Educational Technology
Dawson College

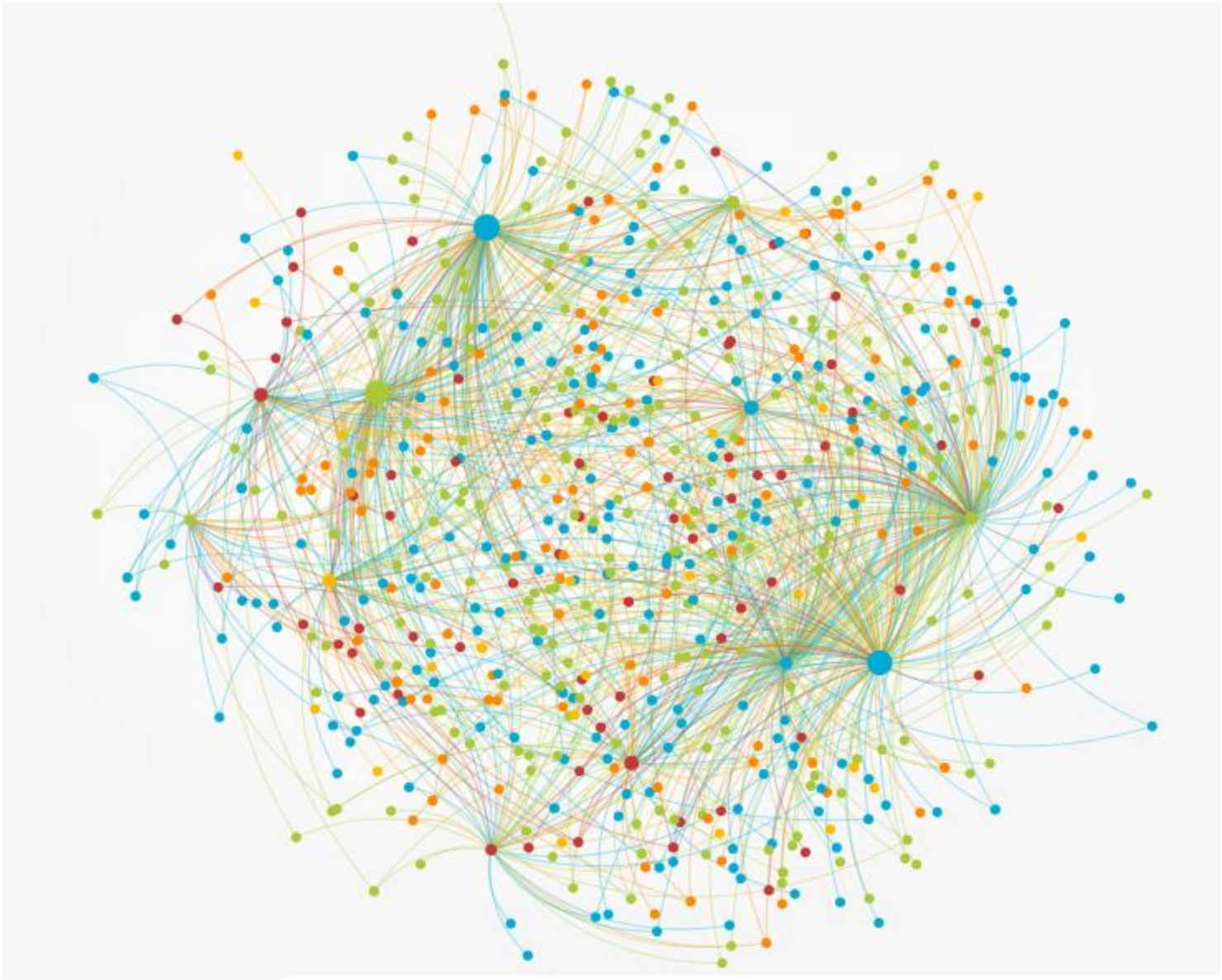
Content

- Definitions: What’s Learning Analytics and Big Data ?
- The Importance of Learning Analytics in Education
- What Learning Analytics Can Do and Can Not Do
- Using Learning Analytics in Moodle
- Using the Results to Improve Teaching
- Questions

Big Data

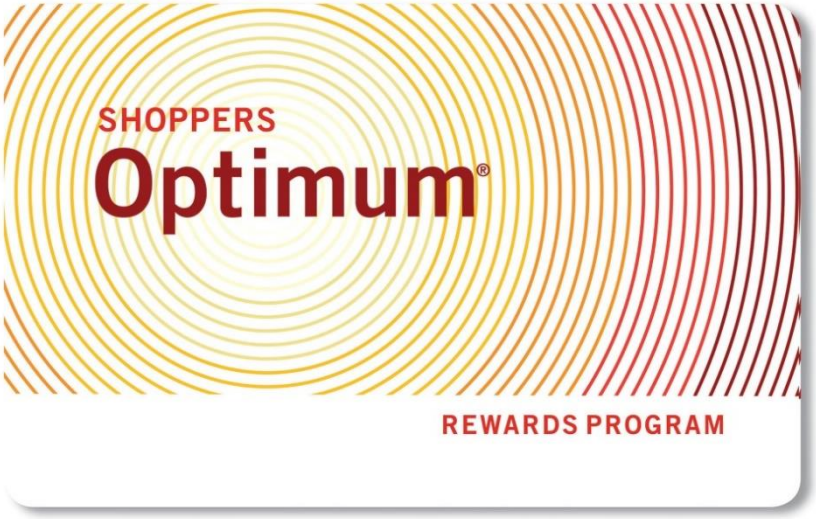
Extremely large data sets that may be analyzed computationally to **reveal patterns, trends, and associations**, especially relating to human behavior and interactions.

Big Data



Big Data

Getting Users' Data



http://www.tubechop.com/watch/5748183

Big Data


WAIT, I MAY HAVE A CARD SHOWING MY LOYALTY TO WHATEVER STORE THIS IS
LOYALTY POINTS
6
TOM FISH BURNE

Big Data

Diapers and Beer

One of the largest U.S. retail shops found that the sale of disposable diapers had some connection with the sale of beer. This type of information is quite strange at first and if we analyze the data "manually" we would probably ignore it.

Big Data

TECH | 2/16/2012 @ 11:02AM | 2,119,347 views

How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did

319 comments, 169 called-out + Comment Now + Follow Comments

Every time you go shopping, you share intimate details about your consumption patterns with retailers. And many of those retailers are studying those details to figure out what you like, what you need, and which coupons are most likely to make you happy. Target, for example, has figured out how to data-mine its way into your womb, to figure out whether you have a baby on the way long before you need to start buying diapers.

Target has got you in its aim

38.0k Share 15.3k Tweet 5.8k Share 362 Submit

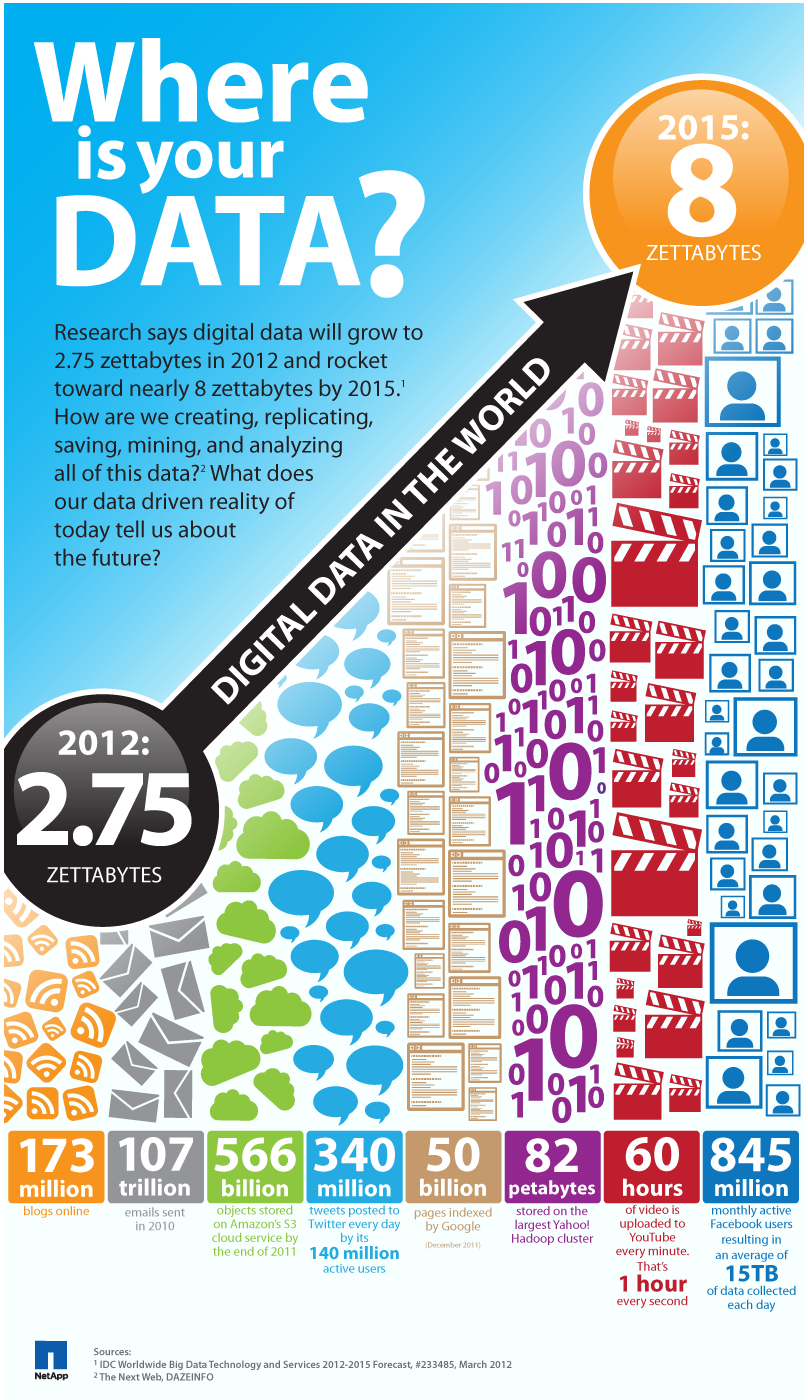
Target knows your secrets (from The Power of Habit by Charles Duhigg)

https://youtu.be/RC5HNTj3Dag

Big Data

Getting Users' Data

"Likeosphere"



1 ZB = 1000^7 bytes = 10^{21} bytes

= 1000 exabytes

= 1 billion terabytes

= 1 trillion gigabytes

Big Data


WE'VE DECIDED TO TAKE BIG DATA TO THE NEXT LEVEL...
HUMONGOUS DATA
© D.Fletcher for CloudTweaks.com

Big Data in Education

Data should be used to improve learning!

Learning Analytics

"Learning Analytics is the use of intelligent data, learner-produced data, and analysis models to discover information and social connections for predicting and advising people's learning." *George Siemens*

Examples:

- *Student dropout predictions systems*
- *Live statistics about the learners*
- *Individual progress vs group progress*

Learning Analytics

Learning Analytics is the **measurement**, **collection**, **analysis** and **reporting** of data about **learners** and their contexts,

In order to **understand** and **optimize learning** and the environments in which it occurs.

Educational Data Mining

Educational Data Mining is a term used for processes designed for the analysis of **data** from **educational** settings to better understand students and the settings which they learn in.

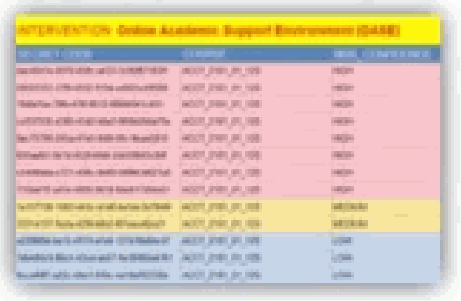
Academic vs Learning Analytics

Academic Analytics	Learning Analytics
A process for providing higher education institutions with the data necessary to ***support operational and financial decision making****	*The use of analytic techniques to help target instructional, curricular, and support resources to* ***support the achievement of specific learning goals****
Focused on the **business of the institution**	Focused on the **student and their learning behaviors**
Management/executives are the primary audience	**Learners and instructors** are the primary audience

Learning Analytics

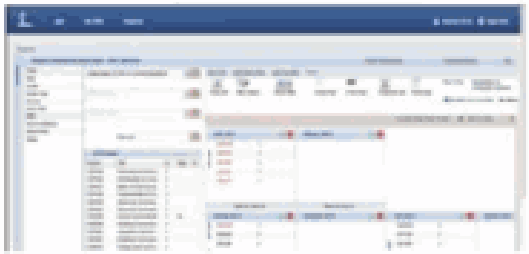
Types of Learning Analytics Systems

Academic Early Alert Systems

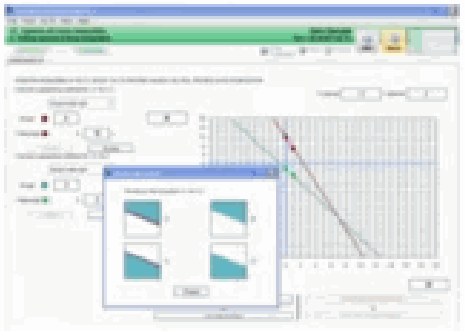


Data Visualization

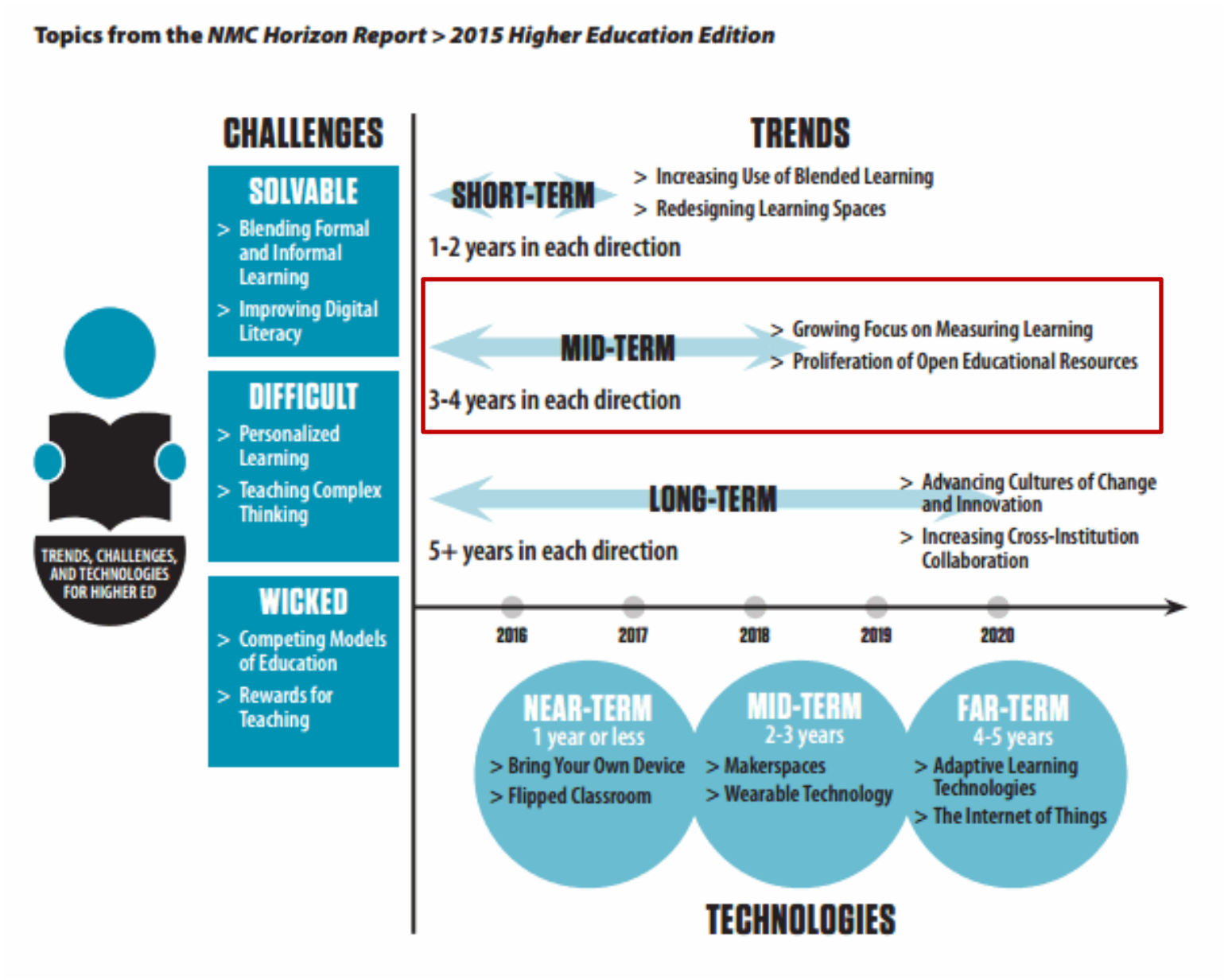
Student Advising & Recommendations



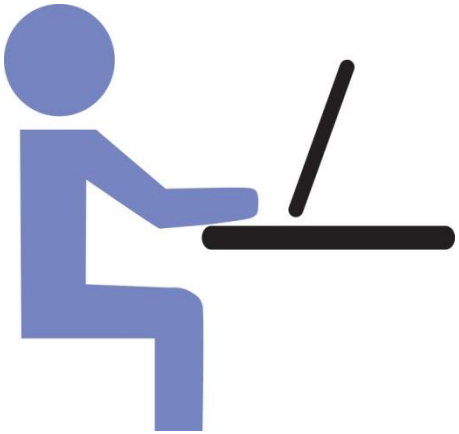
Adaptive Learning & Cognitive Tutoring

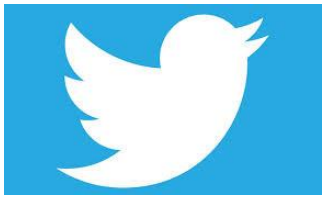


Learning Analytics



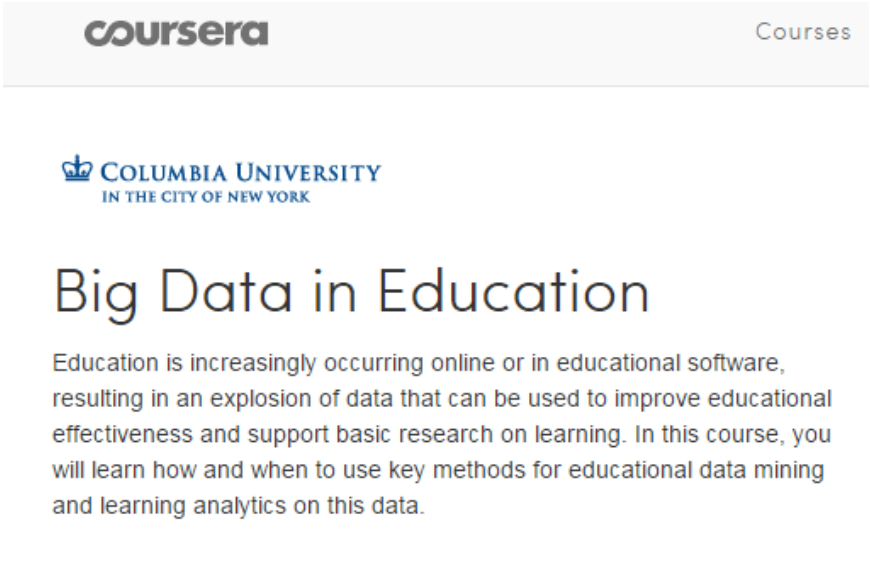
Learner-Produced Data





Big Data in Education

coursera



https://www.coursera.org/course/bigdata-edu

https://www.youtube.com/watch?v=6hay0d57Ntw

MOOT: "Big Data in Education" (2014)

http://www.columbia.edu/~rsb2162/bigdataeducation.html

Big Data in Education

BrandeisNOW

Monday, April 20, 2015

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Brandeis expands online course offerings with Learning Analytics graduate certificate

New fall program combines data analysis with the expanding field of online learning

April 14, 2015

Brandeis University's Graduate Professional Studies division (GPS) will launch a fully-online graduate certificate program in Learning Analytics in September 2015, the university announced today.

Facebook
Twitter
Print
Email
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Designed to be completed in 1.5 years or less, the program is for professionals with strong backgrounds in education, instructional design, or institutional research. Cross-disciplinary in nature, the certificate will provide students with the foundational tool sets and theory of business intelligence and data analysis. These skillsets are necessary for evaluating the effectiveness of courses, programs and instruction, and prepare students to fill a highly in-demand skills gap in a burgeoning job market.

"As the learning analytics field continues to evolve, it is more important than ever before to use the technology and data we have available to us to understand and, ultimately, enhance the learning experience," said Brian Salerno, director of Online Learning and Instructional Design at Brandeis GPS.

http://www.brandeis.edu/now/2015/april/gps-learning-analytics-grad-certificate.html

Learning Analytics

LA software compares a student's activity with others in the class, with students who previously took the course, and/or against other rubrics to create a model for how each student is likely to fare.

In this way, LA capitalizes on the vast quantities of data that most colleges and universities collect to find patterns that can be used to **improve learning**.

Learning Analytics: What it Can Do?

- **Predict future student performance** (based on past patterns of learning across diverse student bodies)
- **Intervene when students are struggling** to provide unique feedback tailored to their answers
- **Personalize the learning process** for each and every student, playing to their strengths and encouraging improvement
- **Adapt teaching and learning styles** via socialization, pedagogy and technology

Learning Analytics

The most common use of learning analytics is to identify students who appear less likely to succeed academically and to enable—or even initiate—targeted interventions to help them achieve better outcomes.

LA tools to identify specific units of study or assignments in a course that cause students difficulty generally. Instructors can then make curricular changes or modify learning activities to improve learning on the part of all students.

Learning Analytics

Much of the data on which LA applications depend comes from the learning management system (LMS), including:

- log-in information
- rates of participation in specific activities
- time students spend interacting with online resources or others in the class,
- grades

Learning Analytics

- Applications that perform data collection and analysis are frequently either built into or added onto the LMS from which they draw primary data.

- Analytics tools: tied to their software, built by colleges or universities or by third parties to work with the LMS.

Learning Analytics

LA applications gather data, analyze that data, generate reports, and enable interventions. In most cases, this happens without an opt-in by students.

The types of analyses performed vary, but one approach involves the evaluation of historical student data to create predictive models of successful and at-risk students.

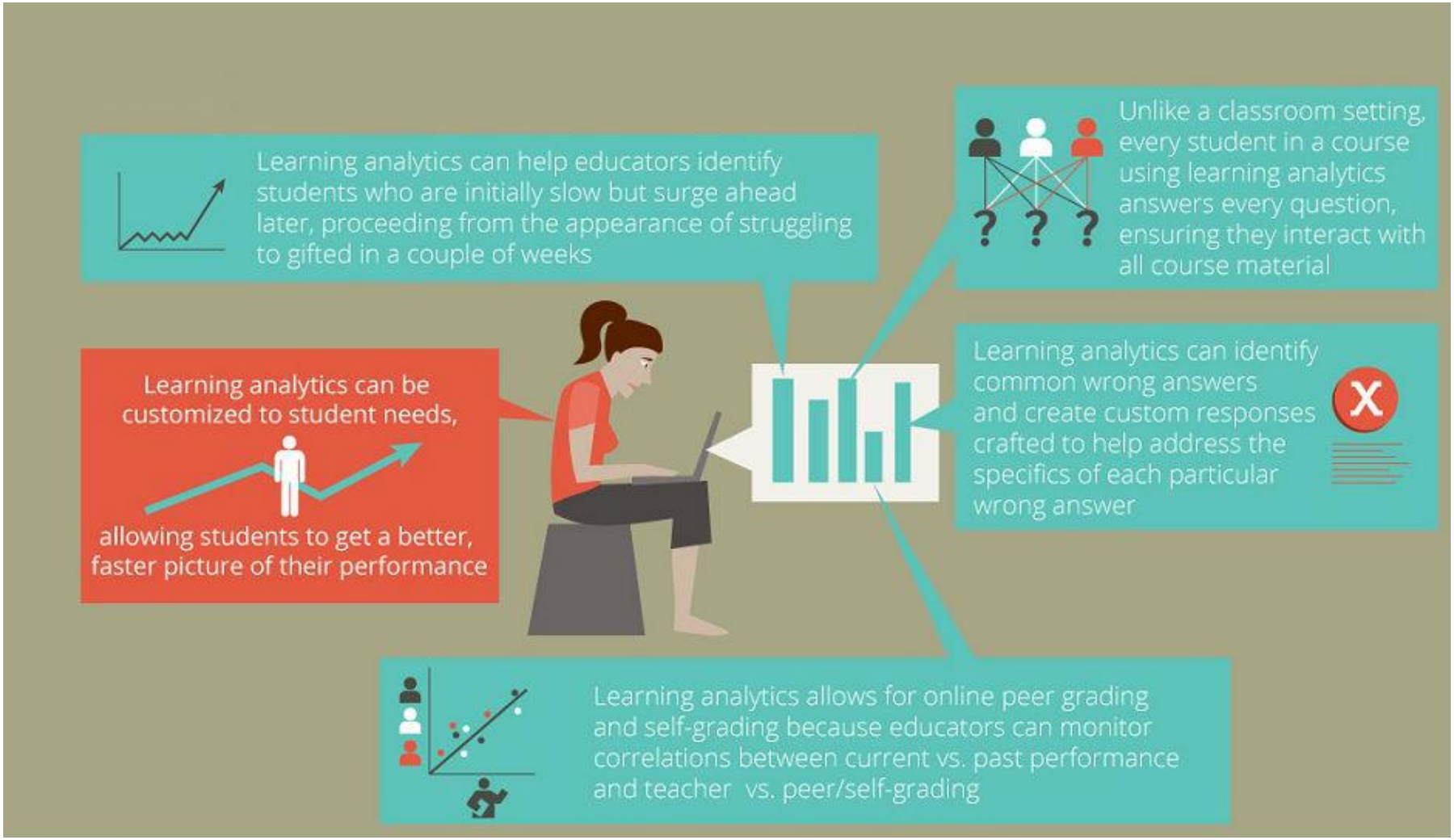
Learning Analytics

Reports can take various forms, but most feature data visualizations designed to facilitate quick understanding of which students are likely to succeed.

Some systems **proactively notify users**; other systems require users to take some action to access the reports.

System-generated interventions can range from a simple alert about a student's likelihood of success to requiring at-risk students to take specific actions to address concerns.

Learning Analytics



Learning Analytics

Humanizing Analytics

Marie Wallace: Privacy by design: humanizing analytics

https://www.youtube.com/watch?v=8JLzs_xVKxY

What Learning Analytics Can't Do?

Data from tracking systems is not inherently intelligent

Hit counts and access patterns do not really explain anything.

The intelligence is in the interpretation of the data by a skilled analyst.

Ideally, data mining enables the visualization of interesting data that in turn sparks the investigation of apparent

What Learning Analytics Can't Do?

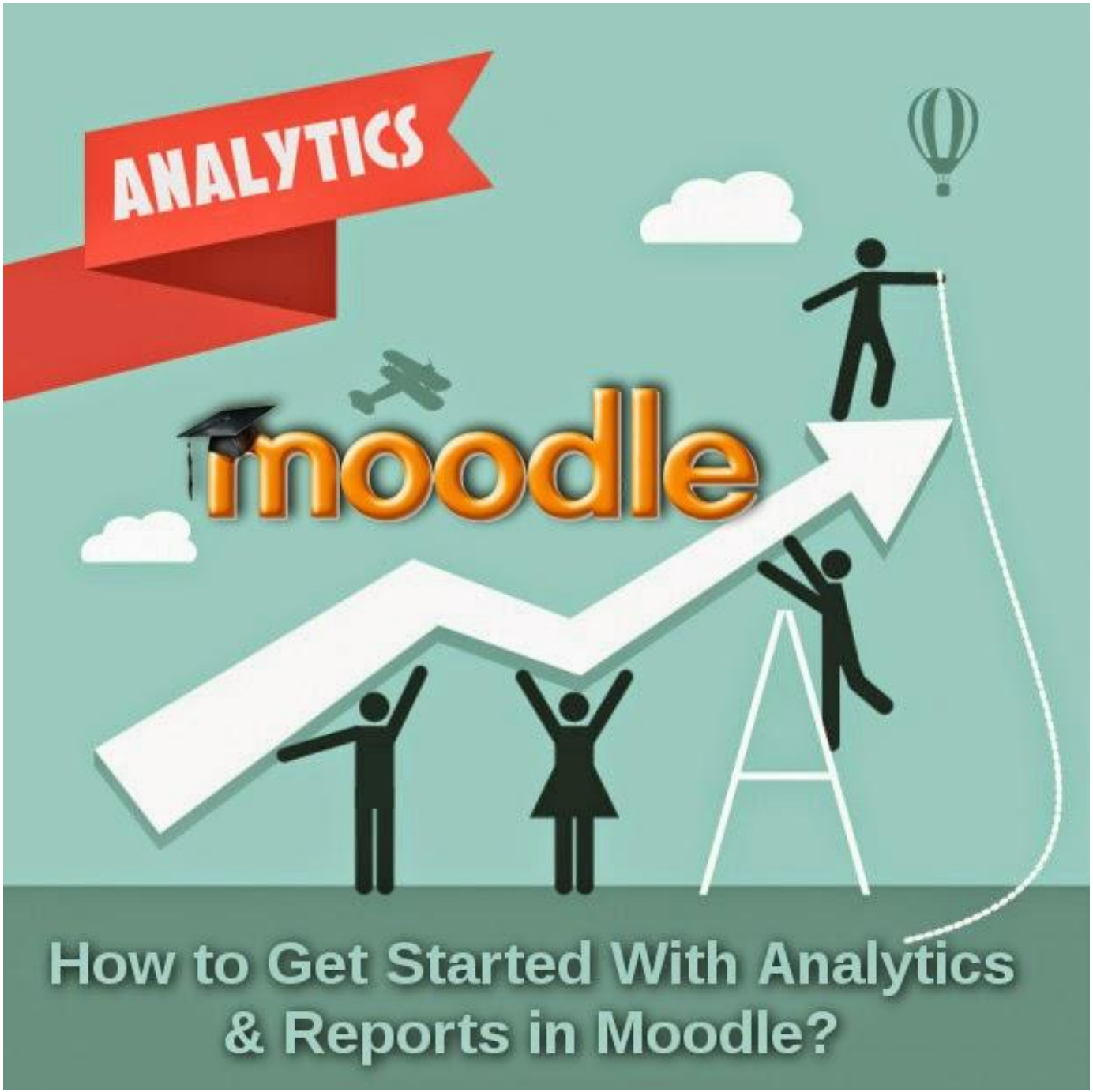
Another thing analytics can not do by themselves is improve instruction

While **they can point to areas in need of improvement** and they can identify engaging practices, the numbers can not make suggestion for improvements.

This requires a human intervention – usually in the form of a focus group or by soliciting suggestions from the learners themselves.

Learning Analytics Outcomes

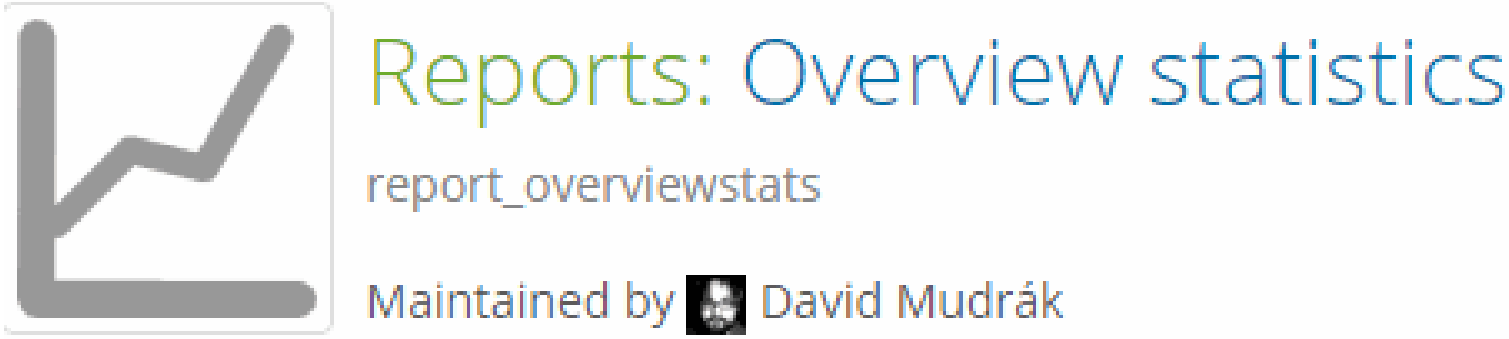
- **Prediction purposes**, for example to identify 'at risk' students in terms of drop out or course failure
- **Personalization & Adaptation**, to provide students with tailored learning pathways, or assessment materials
- **Intervention purposes**, providing educators with information to intervene to support students
- **Information visualization**, typically in the form of so-called **learning dashboards** which provide overview learning data through data visualisation tools


ANALYTICS
moodle
How to Get Started With Analytics
& Reports in Moodle?

Analytics & Reports in Moodle

1. Overview Statistics (Plugin)

This plugin produces a website and course reports charts, comprising countries, user-login, preferred languages, number of courses by category, by size and enrolled users. Moreover, this high-end plugin will also extend the main feature of statistics in a Moodle website. The code has been designed in such a way that makes adding more reports a lot easier and simpler

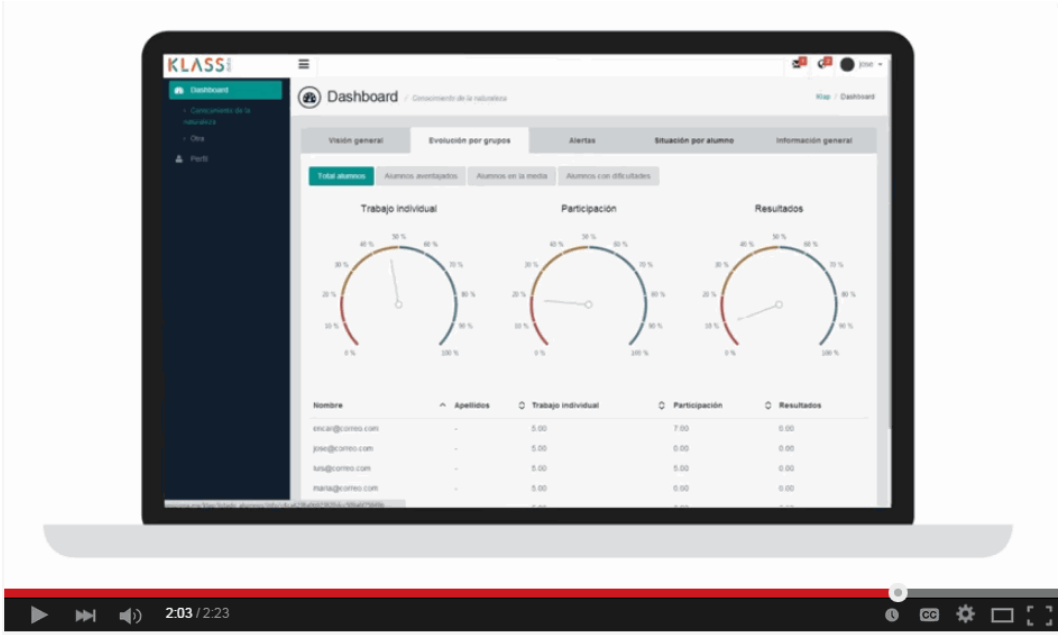


https://moodle.org/plugins/view/report_overviewstats

Analytics & Reports in Moodle

2. KlassData http://klassdata.com/

SmartKlass™ is a **Learning Analytics dashboard** that should be included as a part of the Moodle virtual learning platform to empower teachers to manage the learning journey of their students.



KlassData: Learning Analytics for Education

https://www.youtube.com/watch?t=35&v=yiJkTDwmIn8

Analytics & Reports in Moodle

3. Events Monitoring

A new feature introduced within Moodle 2.8, events monitoring allows admins and teachers to receive notification when certain events happen in Moodle.

Watch the events monitor in action here and explore some event examples.

Analytics & Reports in Moodle

4. Site-Wide Reports

Moodle administrators have access to a variety of powerful and useful site-wide reports for learning analytics, including security, question instances, logs and comments.

More info: site-wide reports

Analytics & Reports in Moodle

5. Engagement Analytics (Plugin)

Engagement Analytics block provides information about student progress against a range of indicators and student activities which have been identified by current research to have an impact on student success in an online course.

This plugin is not yet supported for Moodle 2.8 and requires mod and block plugins.

More info: Engagement Analytics plugin

Analytics & Reports in Moodle

6. Logs

These activity reports can be viewed by the administrator at the teacher level, site level and with live logs.

More info: documentation on Logs

Analytics & Reports in Moodle

7. Forum Graph

The **Forum Graph Report** analyses interactions in a single Forum activity and create a force-directed graph using the D3.js Javascript library.

This plugin is not yet supported for Moodle 2.8.

More info: Forum Graph plugin

Analytics & Reports in Moodle

8. Analytics (Piwik & Google)

This local Moodle Module adds Analytics, currently supports 3 Analytics modes: **Piwik**, **Google Universal Analytics** and **Google Legacy Analytics**.

This plugin is not yet supported for Moodle 2.8.

Read more about the plugin here.

Analytics & Reports in Moodle

Using Excel Macros to Analyse Moodle Logs

Dr. Andreas Konstantinidis

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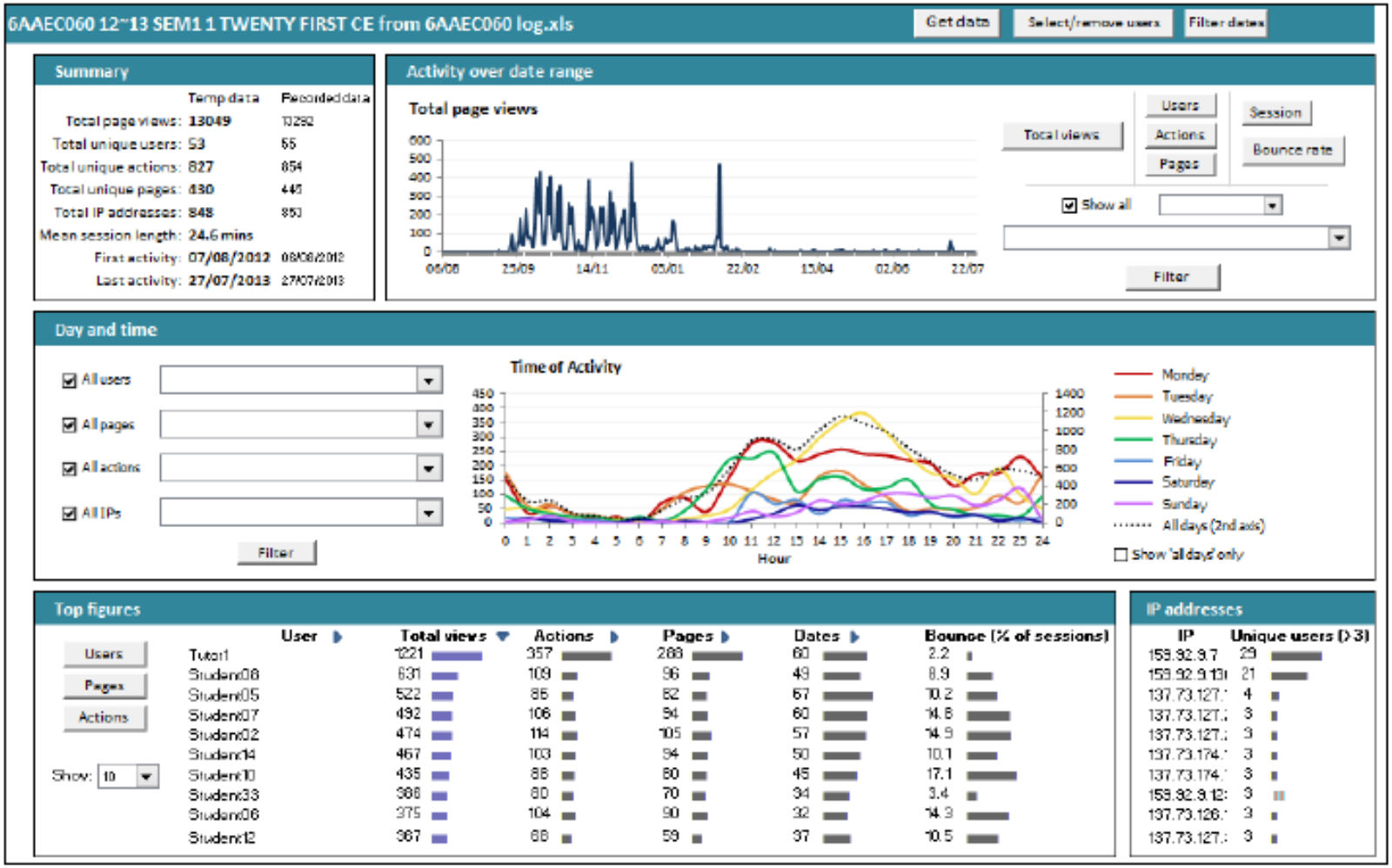
Abstract

Learning analytics enables tutors to gain useful insights on the behaviour of students in an online learning environment. This information can then be utilised to customize the educational space, optimize the learning resources and activities, and personalize the student experience. This paper presents our approach to analysing the data of users' behaviours that are recorded in the Moodle logs. Currently, the Moodle logs manager suffers from functional limitations and uninspiring visualizations. Our method utilises the possibility of downloading the logs in Microsoft Excel format and provides a simple and effective offline solution. The method we have developed is based on Excel macros and visual basic. Tutors can experiment with different combinations of metrics such as total page views, unique users, unique actions, IP addresses, unique pages, average session length and bounce rate. Furthermore, the software allows the definition of date ranges and the selection of individual or groups of students. The complicated processes of analysing and combining data are carried out in the background, enabling tutors to focus on the pedagogic implications and invest in practical, realistic scenarios through informed decision-making. Future work includes transferring the offline functionality to an online Moodle plugin and increasing system intelligence to allow the production of meaningful and actionable suggestions with regards to set target goals.

http://research.moodle.net/pluginfile.php/333/mod_data/content/1233/Using%20Excel%20Macros%20to%20Analyse%20Moodle%20Logs.pdf

Analytics & Reports in Moodle



edX Course (MOOC)

Archived Course

UTArlingtonX

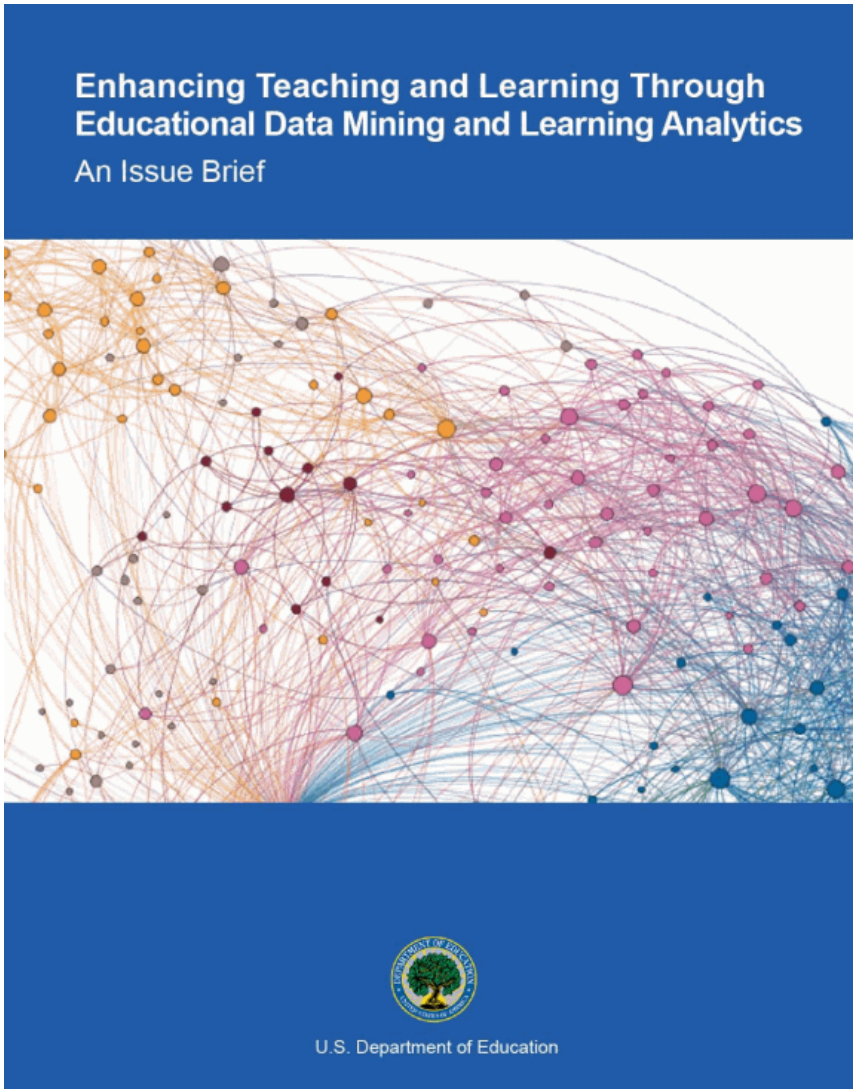
Course Completed - Dec 22, 2014 at 23:00 UTC

LINK5.10x Data, Analytics, and Learning

Final course details are being wrapped up at this time. Your final standing will be available shortly.

https://courses.edx.org/courses/UTArlingtonX/LINK5.10x/3T2014/info

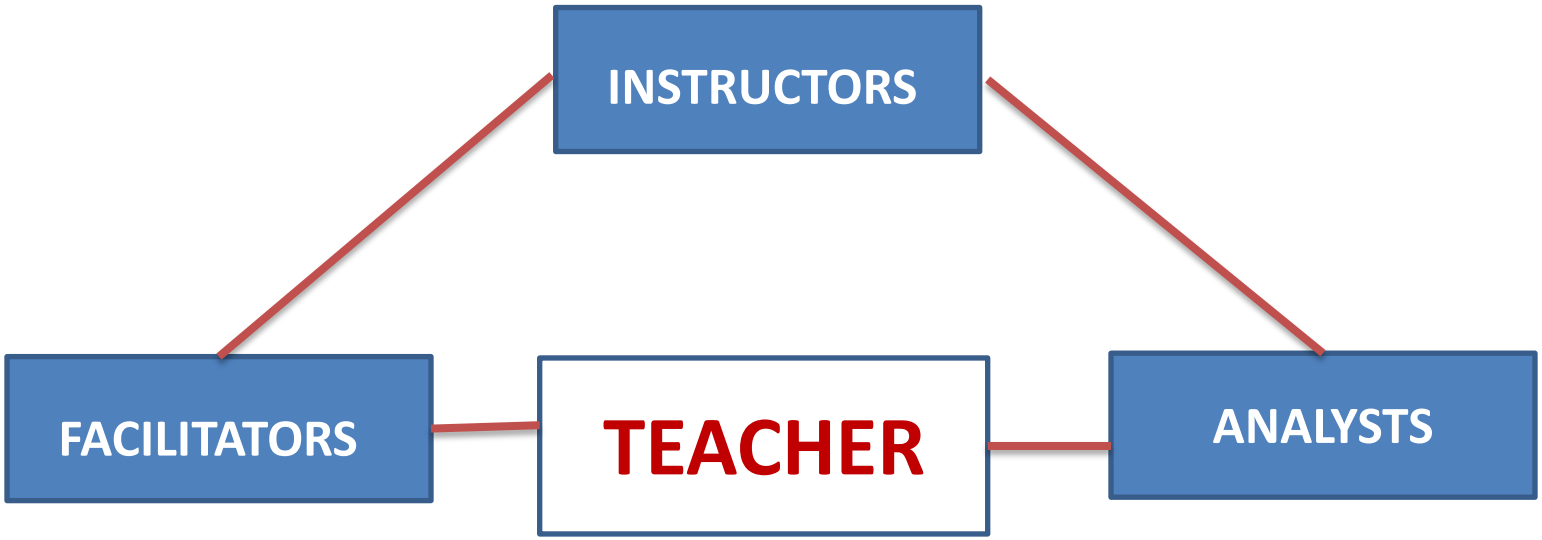
USDE Booklet on L.A.



http://tech.ed.gov/wp-content/uploads/2014/03/edm-la-brief.pdf

The Future

Teachers will fill multiple roles:



Questions

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rscapin

DawsonITE Blog

http://dawsonite.dawsoncollege.qc.ca


MERCI!
THANK YOU!