Using learning analytics to improve student transition into, and support throughout the 1st year

Workshop delivered in partnership by the
ABLE Project 2015-1-BE-EPPKA3-PI-FORWARD
STELA Project - 2015-1-UK01-KA203-013767

Co-funded by the Erasmus+ Programme of the European Union

Welcome

Welcome

- Who are we?
  - **Tinne De Laet**
    KU Leuven
    Head of Tutorial Services of Engineering Science
    promotor ABLE and STELA
    background = mechanical engineer
  - **Sven Charleer**
    Doctoral researcher ABLE, KU Leuven

  - **Tom Broos**
    Doctoral researcher STELA, KU Leuven

Welcome

- Who are we?
  - **Sarah Lawther**
    Learning and Teaching Officer, Nottingham Trent University
  - **Rebecca Edwards**
    ABLE Project Officer, Nottingham Trent University

  - **Maartje van den Bogaard,**
    ABLE project, Universiteit Leiden

  - **Jan-Paul van Staalduinen**
    STELA project, TU Delft,

Welcome

- Who is in the audience?
  - **stakeholders:**
    - tutors/student counsellors,
    - student support staff
    - academic administration staff
    - lecturer
    - policy makers, leader in education
    - researcher
  - **learning analytics and institute**
    - from institute with/without experience in learning analytics
    - from institute that uses learning analytics to support first-year students
  - **what is your current attitude toward learning analytics**
    - sceptic
    - doubting
    - enthusiast

Welcome

- Would you please introduce yourself to the people on your table
  - Who are you?
  - Have you been to any EFYE conferences before?
    - Do you have any advice for first time attenders?

Workshop structure

- Welcome & first discussion
- What is learning analytics?
- First short exploration
- Learning analytics: the partners & the projects
- How can learning analytics support student transition into university?
- What strategies do we need to exploit the insights learning analytics provides?
- Feedback on project ideas
- Conclusion

What is learning analytics?

What is Learning Analytics?

- no universally agreed definition

> *"the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs"* [1]

> *"the process of developing actionable insights through problem definition and the application of statistical models and analysis against existing and/or simulated future data"* [2]

[1] *Learning and Academic Analytics*, Siemens, G., 5 August 2011, http://www.learninganalytics.net/?p=131
[2] *What is Analytics? Definition and Essential Characteristics*, Vol. 1, No. 5. CETIS Analytics Series, Cooper, A., http://publications.cetis.ac.uk/2012/521

What is Learning Analytics?

- no universally agreed definition

"learning analytics is about collecting traces that learners leave behind and using those traces to improve learning" [Erik Duval, 3]

† 12 March 2016

[3] *Learning Analytics and Educational Data Mining*, Erik Duval's Weblog, 30 January 2012, https://erikduval.wordpress.com/2012/01/30/learning-analytics-and-educational-data-mining/

What is Learning Analytics?

How is learning analytics different from institutional data? [4]

- **High-level figures**:
  provide an overview for internal and external reports;
  used for organisational planning purposes.
- **Academic analytics**:
  figures on retention and success, used by the institution to assess performance.
- **Educational data mining**:
  searching for patterns in the data.
- **Learning analytics**:
  use of data, which may include 'big data',
  to provide actionable intelligence for learners and teachers. AND STUDENTS

[4] *Learning analytics FAQs*, Rebecca Ferguson, Slideshare, http://www.slideshare.net/R3beccaF/learning-analytics-fa-qs

What is Learning Analytics?

Different level of analytics

level	beneficiaries
course-level	learners, teachers, faculties
aggregate	learners, teachers, tutors, counsellors, faculties
institutional	administrators, funders, marketing
regional	administrators, funders, policy makers
national and international	national and international governments, policy makers

adapted from http://www.slideshare.net/gsiemens/learning-analytics-educause

What is Learning Analytics?

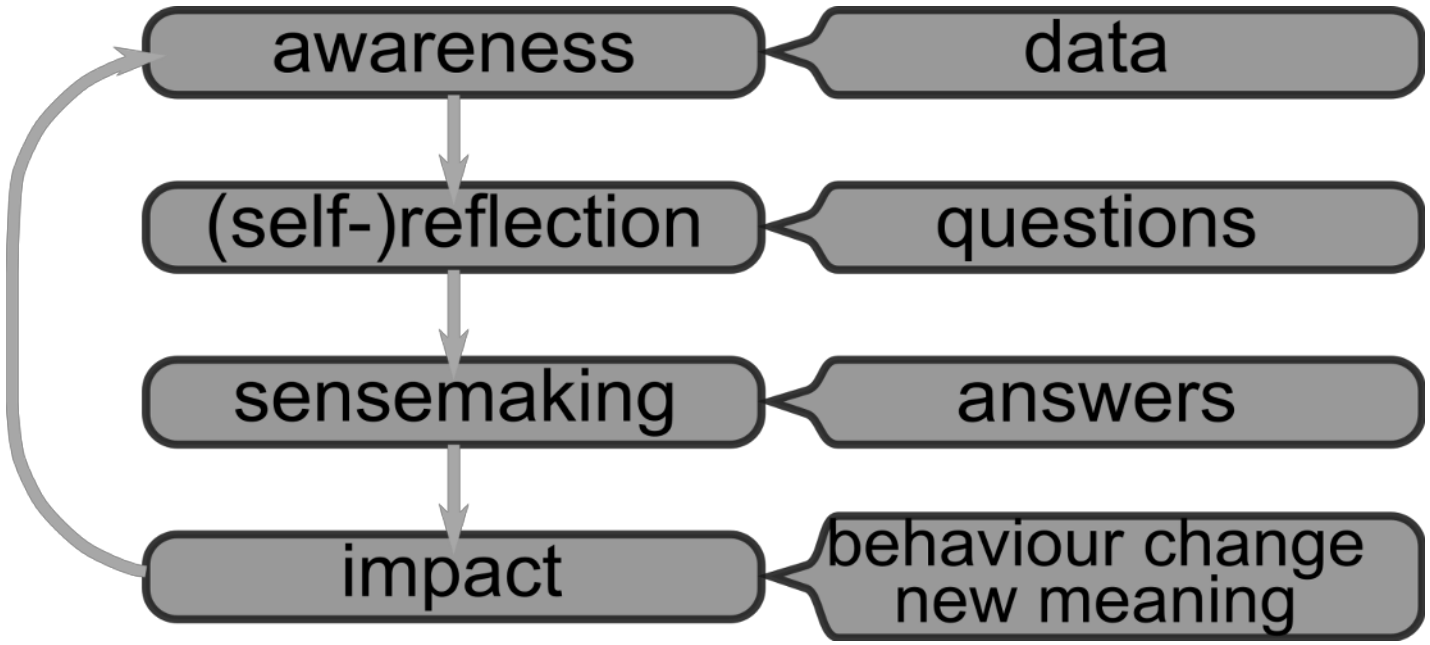
data visualization versus predictive analytics

- is showing data enough?
- how to show data to create sense-making and impact?

- is predicting study success/drop out the only thing that matters?
- can both be combined?

What is Learning Analytics?

learning analytics process model



*[Verbert et al. 2013] Verbert K, Duval E, Klerkx J; Govaerts S, Santos JL (2013) Learning analytics dashboard applications. American Behavioural Scientist, 10 pages. Published online February 201, doi: 10.1177/000276421347936*3

What is Learning Analytics?

how to evaluate learning analytics?

- is perceived usefulness enough?
- is increased self-awareness enough? How will you measure this?
- is increased sense-making enough? How will you measure this?
- how could impact be measured?

What is Learning Analytics?

six critical dimensions of learning analytics

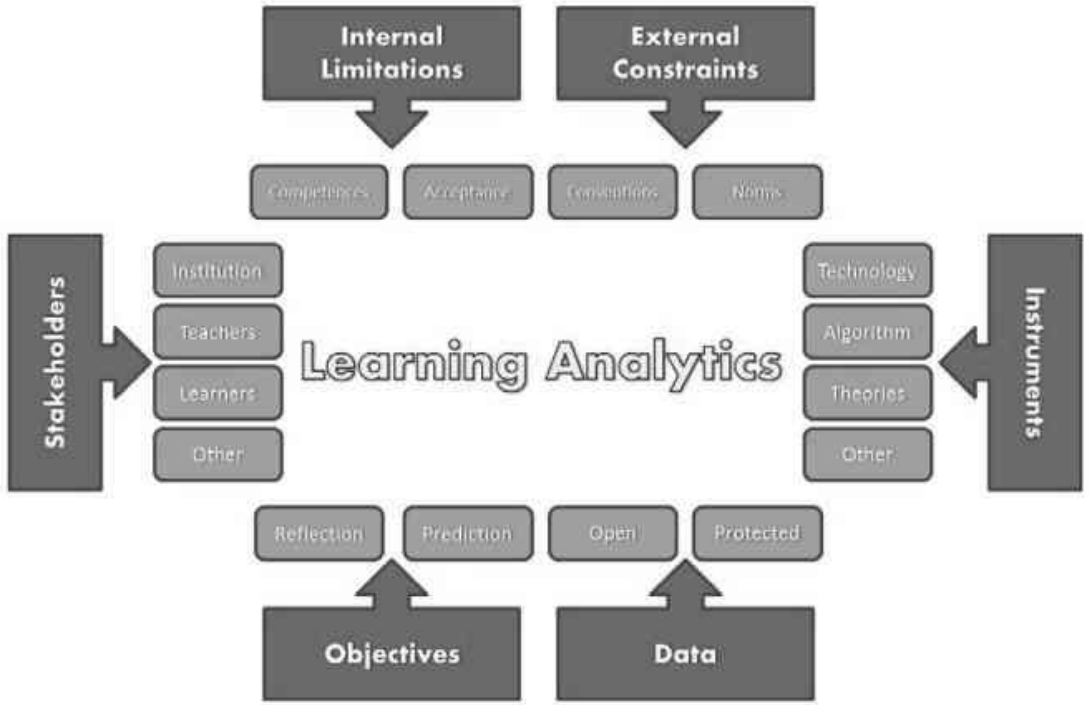


Figure 1. Critical dimensions of learning analytics

[Greller, W., & Drachsler, H. (2012). Translating Learning into Numbers: A Generic Framework for Learning Analytics. Educational Technology & Society, 15 (3), 42–57. http://ifets.info/journals/15_3/4.pdf]

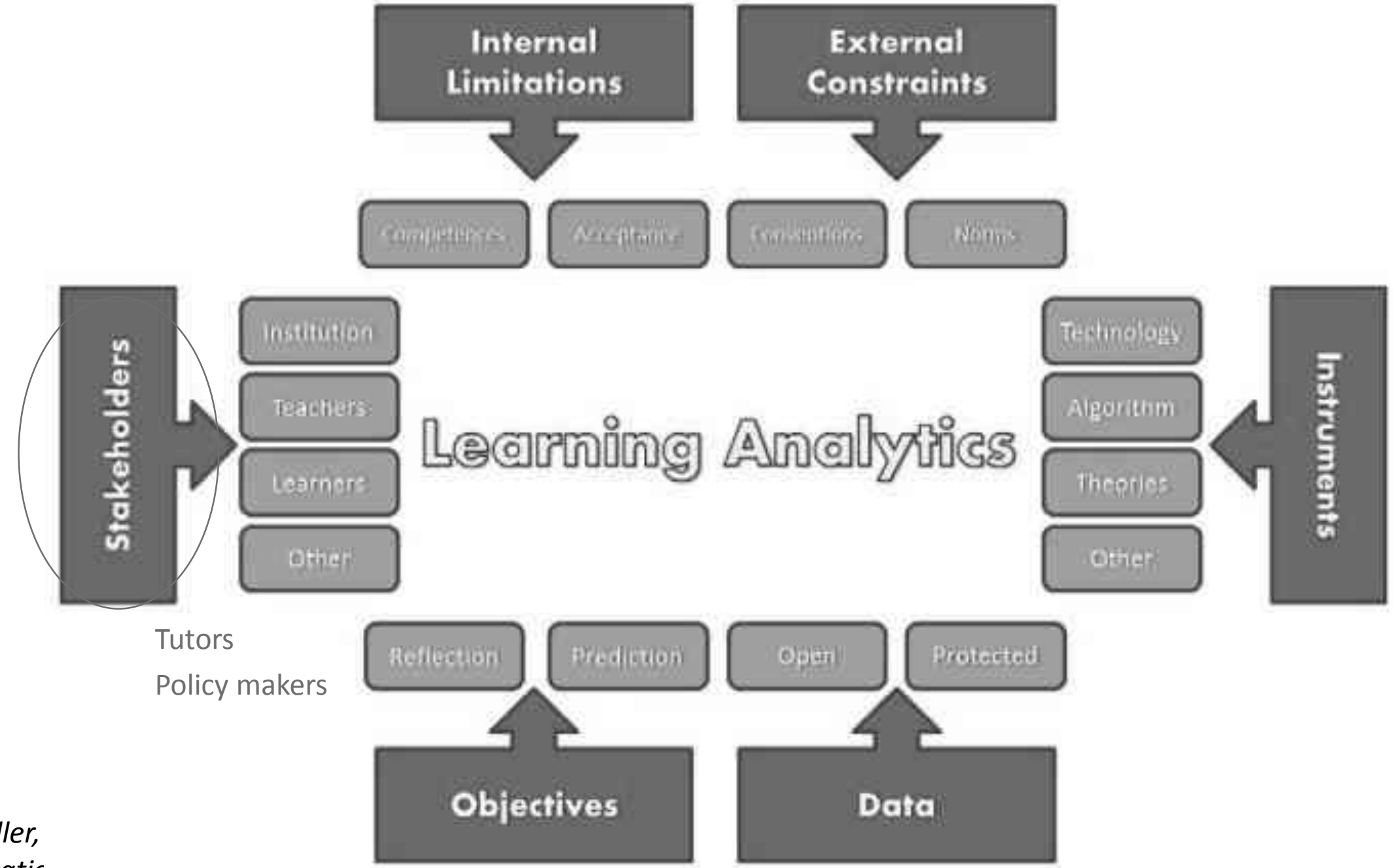


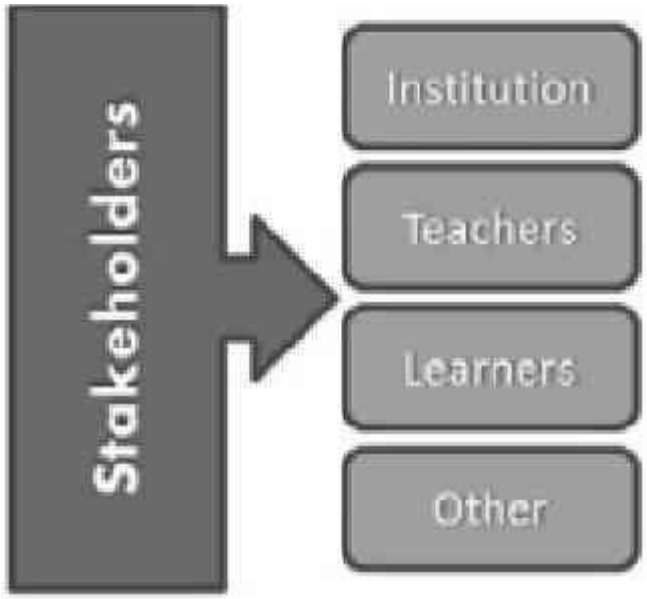
Figure 1. Critical dimensions of learning analytics

Tutors

Policy makers

[Greller,
Educatic

What is Learning Analytics?



- **data subjects**
  - here: students
    (could also be teachers)
- **data clients**
  - **students**
  - **tutors**
  - **academic administrators**
  - **policy makers**

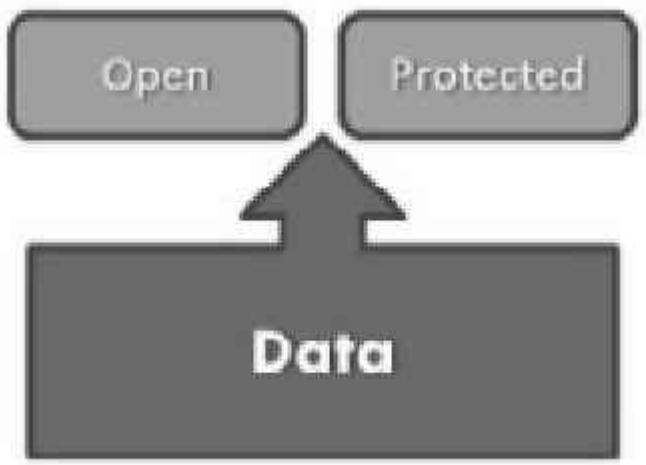
[Greller, W., & Drachsler, H. (2012). Translating Learning into Numbers: A Generic Framework for Learning Analytics. Educational Technology & Society, 15 (3), 42–57. http://ifets.info/journals/15_3/4.pdf]

What is Learning Analytics?

- **what are the objectives?**
- **is it about reflection or prediction?**
  - is showing data enough?
  - how to show data to create self-awareness, sense-making and impact?

[Greller, W., & Drachsler, H. (2012). Translating Learning into Numbers: A Generic Framework for Learning Analytics. Educational Technology & Society, 15 (3), 42–57. http://ifets.info/journals/15_3/4.pdf]

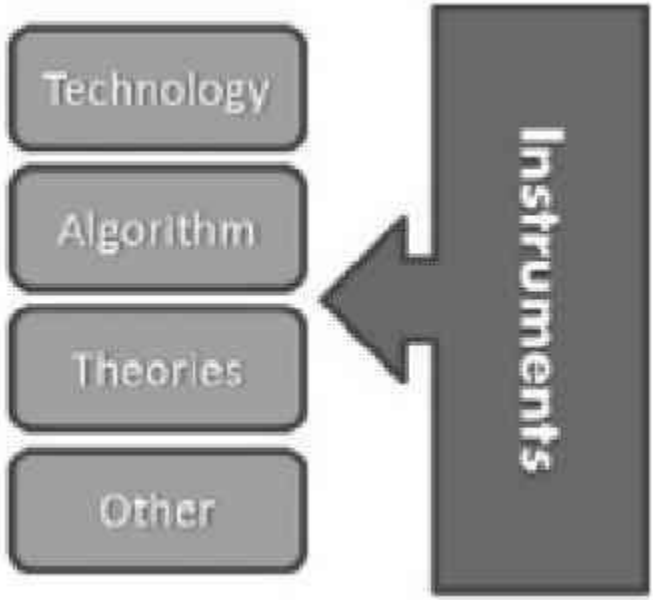
What is Learning Analytics?



- **which data is available?**
- **is it open? protected?**
- **is it ethical to use the data?**

[Greller, W., & Drachsler, H. (2012). Translating Learning into Numbers: A Generic Framework for Learning Analytics. Educational Technology & Society, 15 (3), 42–57. http://ifets.info/journals/15_3/4.pdf]

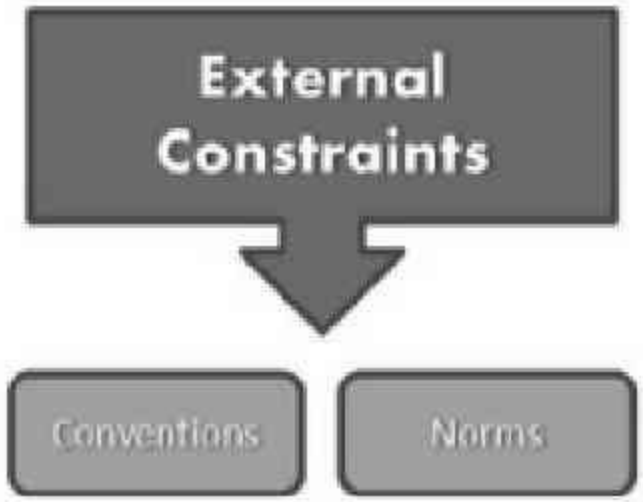
What is Learning Analytics?



- **Technology, algorithms, theories** are at the basis of learning analytics
- **not the focus today**
- **except:** pedagogic theories for supporting students

[Greller, W., & Drachsler, H. (2012). Translating Learning into Numbers: A Generic Framework for Learning Analytics. Educational Technology & Society, 15 (3), 42–57. http://ifets.info/journals/15_3/4.pdf]

What is Learning Analytics?

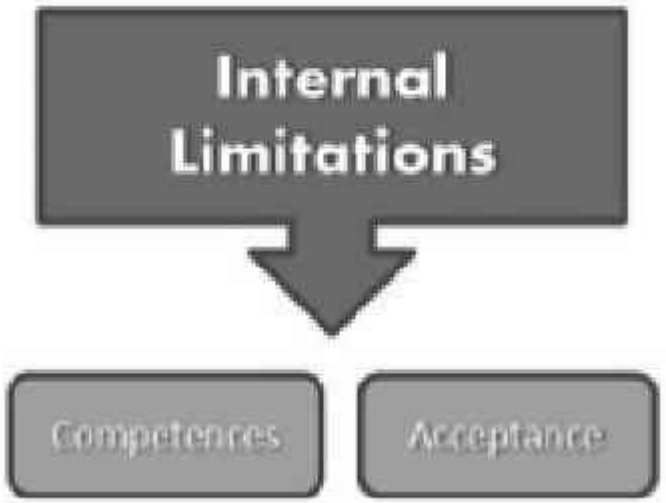


- **conventions:** ethics, personal privacy, and similar socially motivated limitations
- **norms:** restricted by laws or specific mandated policies or standard

ethics and privacy IS a big issue

[Greller, W., & Drachsler, H. (2012). Translating Learning into Numbers: A Generic Framework for Learning Analytics. Educational Technology & Society, 15 (3), 42–57. http://ifets.info/journals/15_3/4.pdf]

What is Learning Analytics?



- **competences:** application of learning analytics requires new higher-order competences to enable fruitful exploitation in learning and teaching
- **acceptance:** acceptance factors can further influence the application or decision making that follows an analytics process

[Greller, W., & Drachsler, H. (2012). Translating Learning into Numbers: A Generic Framework for Learning Analytics. Educational Technology & Society, 15 (3), 42–57. http://ifets.info/journals/15_3/4.pdf]

Exploration

Exploration

now that you have some context and before we start spoiling you with our ideas and practices

If you have “carte blanche” for LA in supporting first year experience:

- which goals would you set for your learning analytics intervention?
- what kind of intervention?
- which stakeholders involved?
- how does it fit in different models presented?

Learning analytics at the partners

Nottingham Trent University Student Dashboard

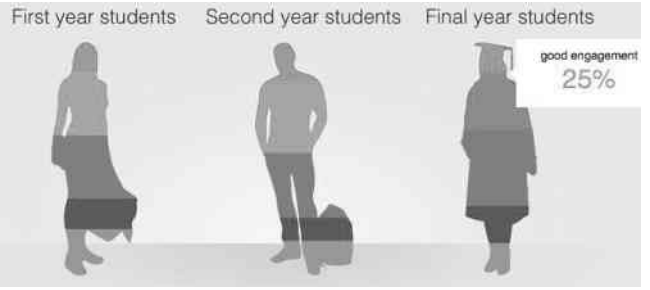
2014 THE AWARDS
AWARD WINNER
OUTSTANDING SUPPORT FOR STUDENTS

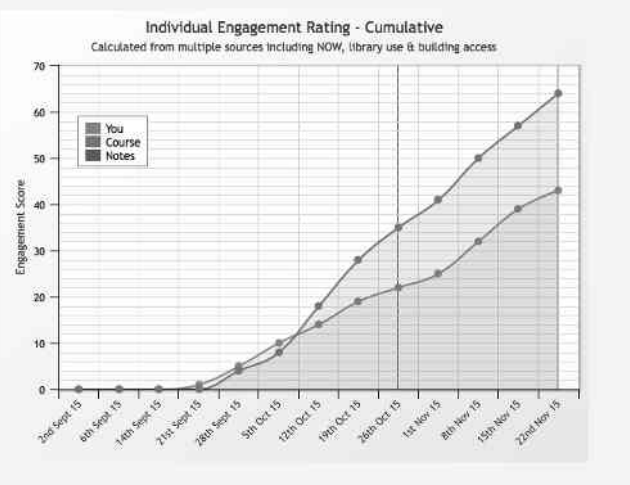
- Whole institution Dashboard
- Focus on engagement, not risk of failure
- Viewed by both students and staff

- Currently 4 key measures
  - Card swipes
  - VLE use & drop box submission
  - Library use
  - We are adding attendance & e-resources

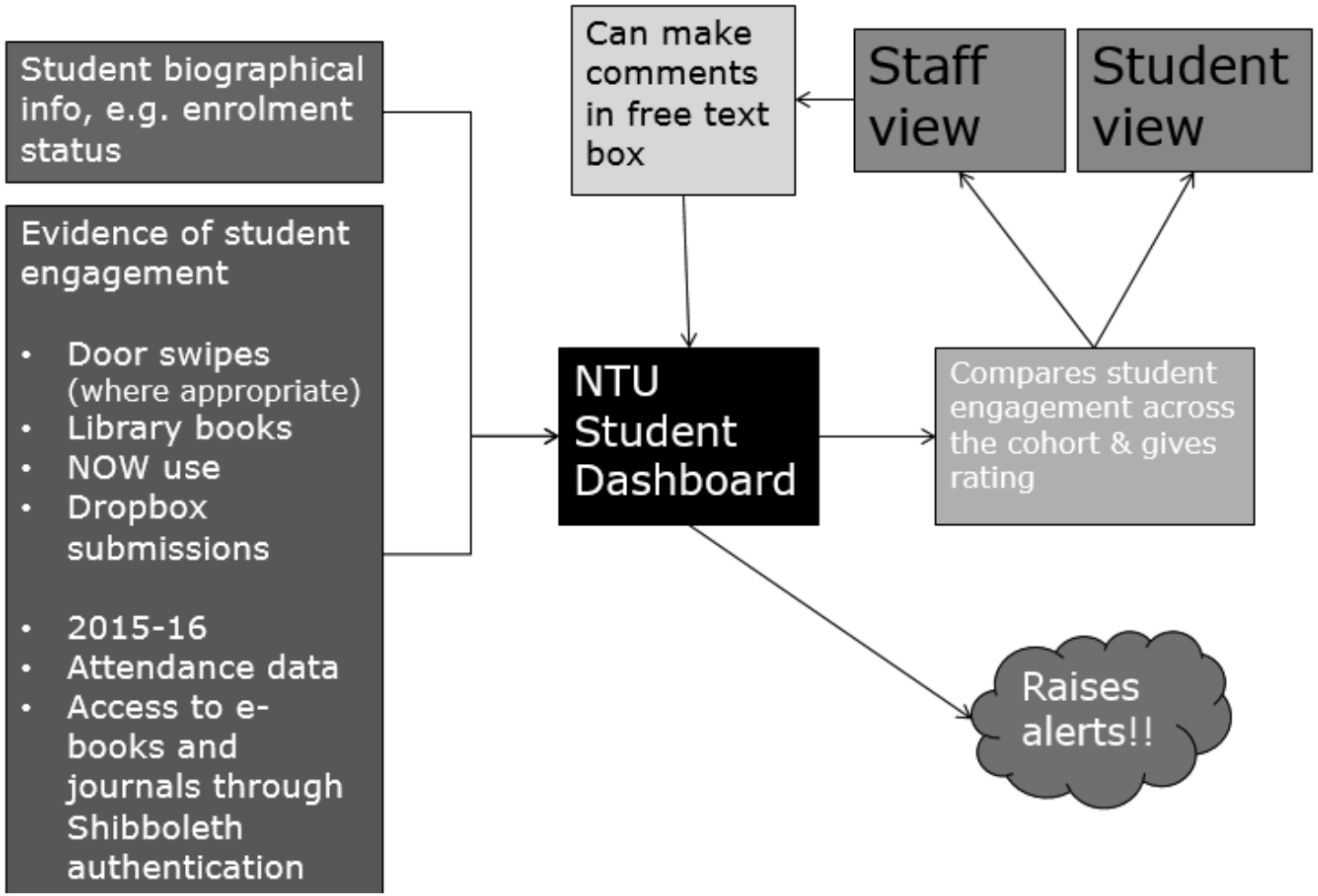
- Strong association between engagement & both progression & attainment

- Challenges remain
  - particularly changing student outcomes





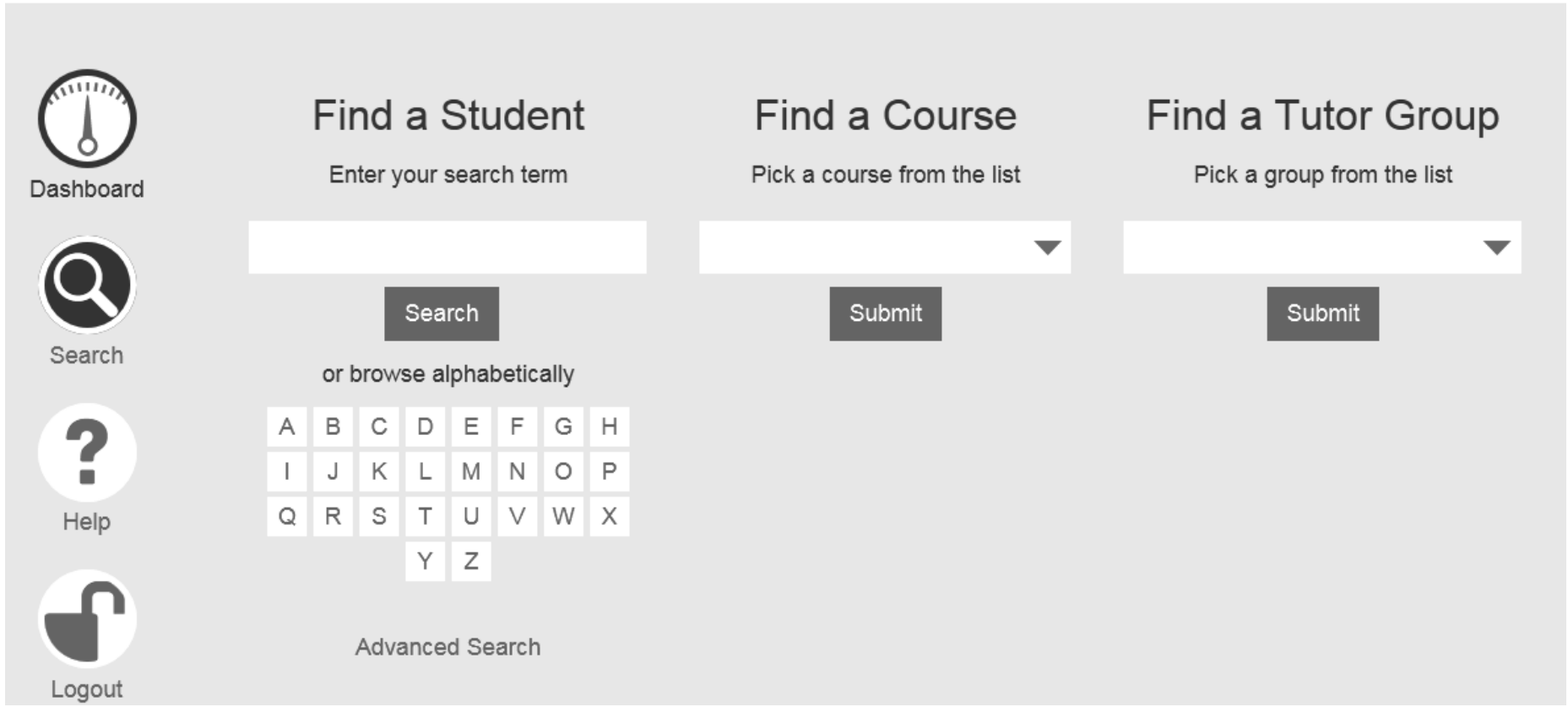
What does the NTU Student Dashboard do?



What does the Student Dashboard look like?

NOTTINGHAM TRENT UNIVERSITY

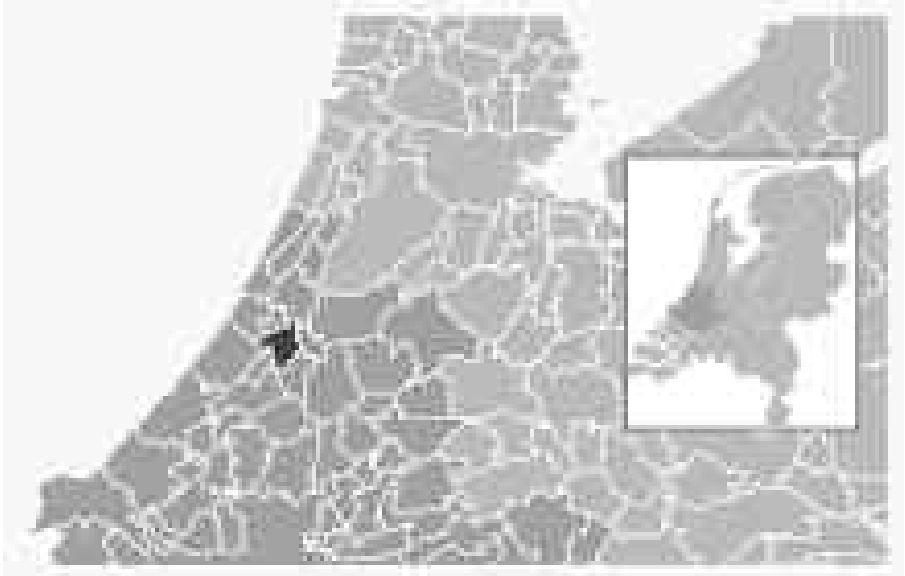
StREAM



Leiden University

Universiteit Leiden
The Netherlands

- Leiden University is in the South West of the Netherlands.
- It has seven faculties in the arts, sciences and social sciences, spread over locations in Leiden and The Hague.
- The University has over 5,500 staff members and 25,800 students.



Leiden University Learning analytics (1)

Matching between student and course

- Online questionnaires on variables pertaining to success in a particular course
- Automated feedback
- Invitations to students at risk to discuss their decisions and needs
- Information is uploaded in central student database and available to student counsellors at all times
- Follow up options for interventions are currently explored

Leiden University Learning Analytics (2)

However:

- The computer systems are not advanced: systems are not linked (yet)
- Privacy regulations are interpreted the conservative way

But:

- Thanks to the experiences with MOOCs and SPOCs awareness of potential benefits beyond the Matching initiative is growing.

Learning Analytics @ TU Delft

- No full-scale LA implementation yet in campus digital learning environment
- Web Information Systems research group and Extension School take active interest in LA
- MOOC platform (edX) provides an opportunity to gain valuable experience with LA

Building with Nature

Leadership for Engineers

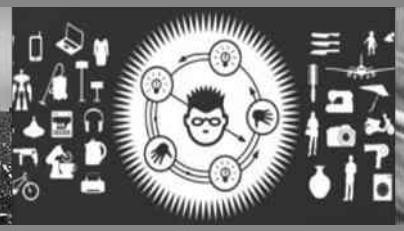
Next Generation Infrastructures

Drinking Water Treatment

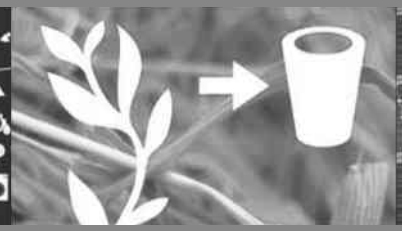
Functional Programming

Data Analysis for your Business XSerie

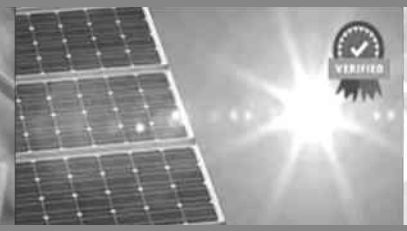
Sustainable Urban Development



Delft Design Approach



Industrial Biotechnology



Introduction to Solar Energy

Responsible Innovation

Treatment of Urban Sewage

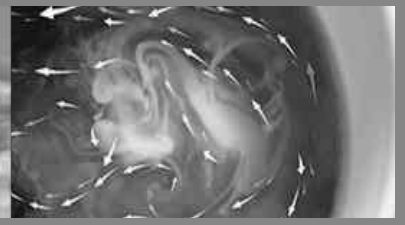
Circular Economy an introduction

Credit Risk Management

Introduction to Water & Climate

Creative Problem Solving

Aeronautical Engineering



Basics of Transport Phenomena

Image | Ability

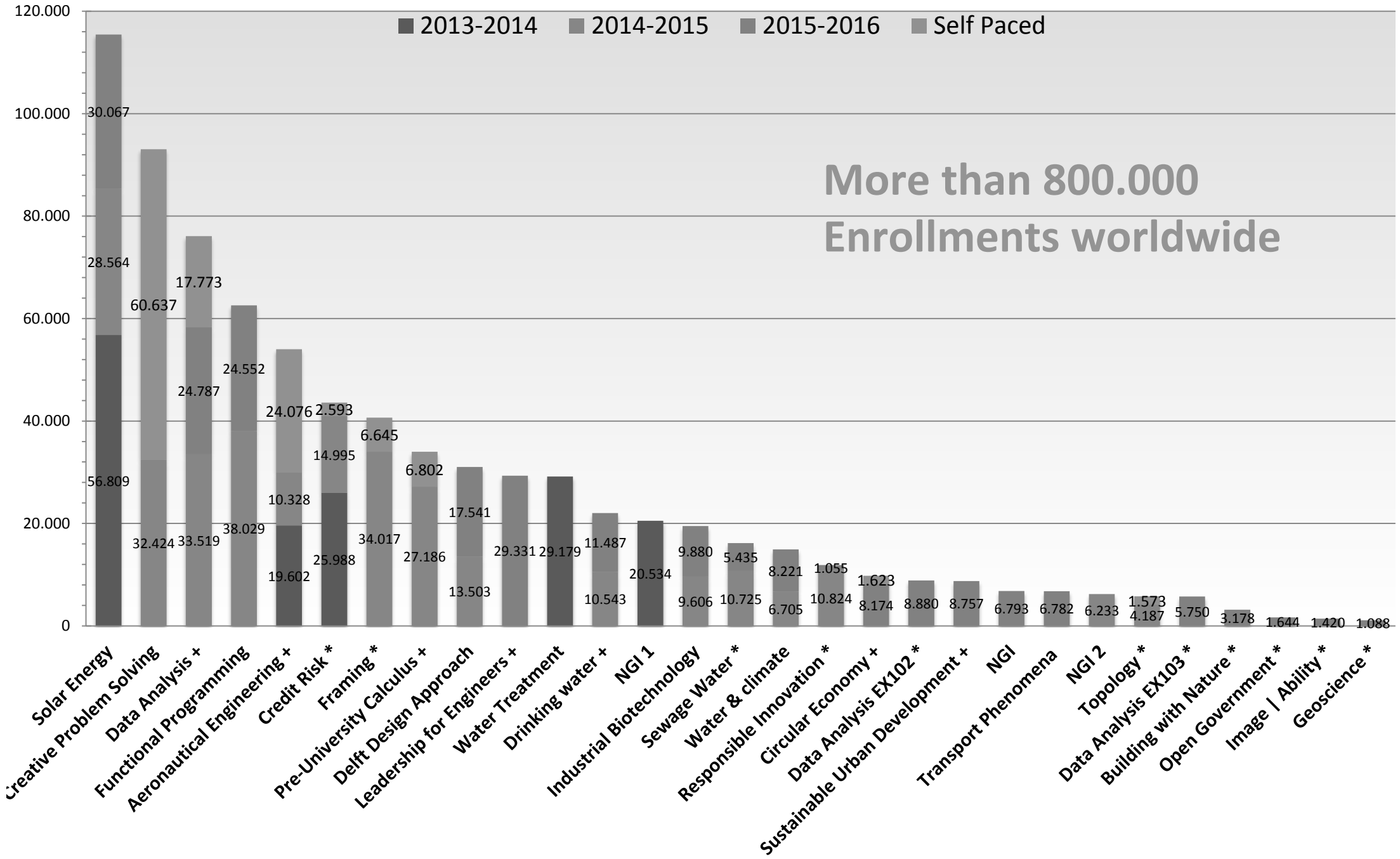
Framing

Topology in Condensed Matter

Pre-University Calculus

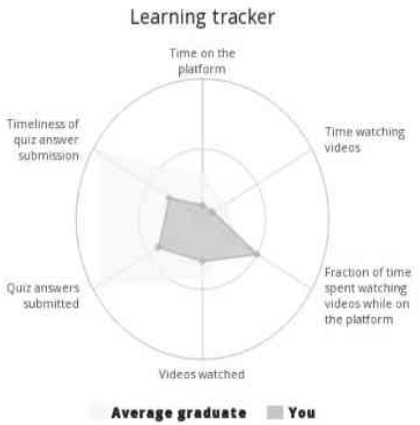
Open Government

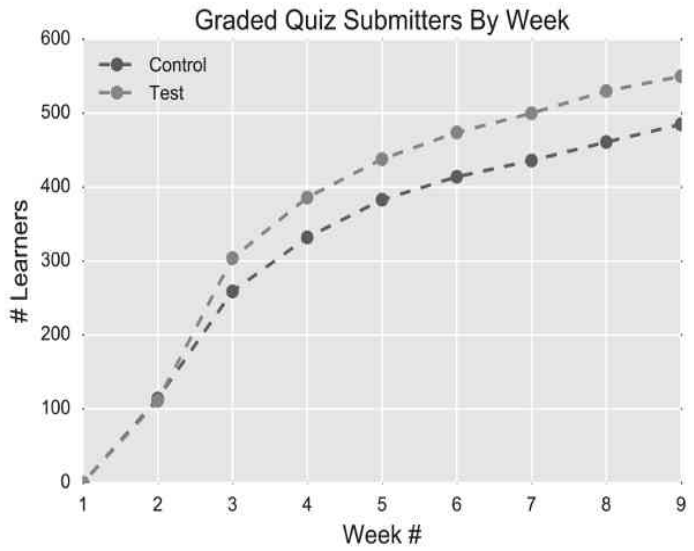
Geology: the earth and its resources

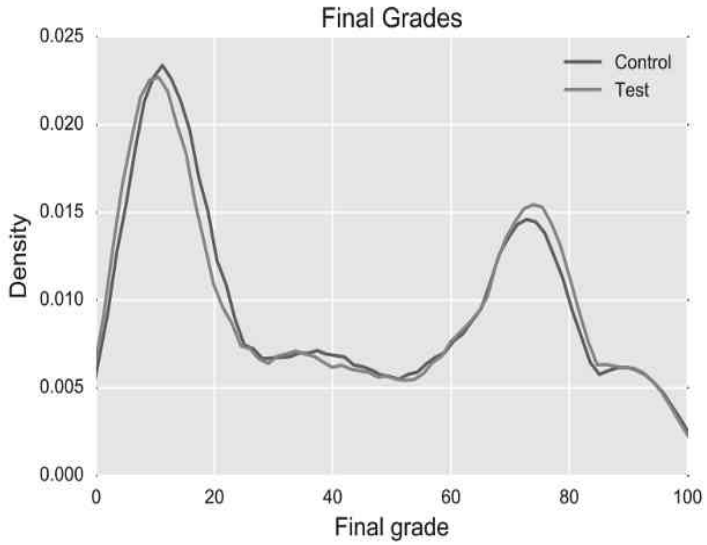

2013-2014
2014-2015
2015-2016
Self Paced
120.000
100.000
80.000
60.000
40.000
20.000
0
More than 800.000
Enrollments worldwide
30.067
28.564
56.809
60.637
32.424
17.773
24.787
33.519
24.552
38.029
24.076
10.328
19.602
2.593
14.995
25.988
6.645
34.017
6.802
27.186
17.541
13.503
29.331
29.179
11.487
10.543
20.534
9.880
9.606
5.435
10.725
8.221
6.705
1.055
10.824
1.623
8.174
8.880
8.757
6.793
6.782
6.233
1.573
4.187
5.750
3.178
1.644
1.420
1.088
Solar Energy
Creative Problem Solving
Data Analysis +
Functional Programming
Aeronautical Engineering +
Credit Risk *
Framing *
Pre-University Calculus +
Delft Design Approach
Leadership for Engineers +
Water Treatment
Drinking water +
NGI 1
Industrial Biotechnology
Sewage Water *
Water & climate
Responsible Innovation *
Circular Economy +
Data Analysis EX102 *
Sustainable Urban Development +
NGI
Transport Phenomena
NGI 2
Topology *
Data Analysis EX103 *
Building with Nature *
Open Government *
Image | Ability *
Geoscience *

Learning Analytics for Learners

- Dashboard running in current Drinking Water MOOC
- In design stages of second iteration (for April MOOCs)







- Demonstration paper accepted at LAK 16 workshop

Daniel Davis, Guanliang Chen, Ioana Jivet, Claudia Hauff, Geert-Jan Houben. “Encouraging Metacognition & Self-Regulation in MOOCs through Increased Learner Feedback” *Learning Analytics for Learners workshop at Learning Analytics & Knowledge*. 2016.

KU LEUVEN

Learning dashboards: time & effort

KU LEUVEN

Abstract to the essential

Charleer, S., Santos, J. L., Klerkx, J., & Duval, E. (2014). Improving teacher awareness through activity, badge and content visualizations. In *New Horizons in Web Based Learning* (pp. 143-152). Springer International Publishing.

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Integrate into the classroom

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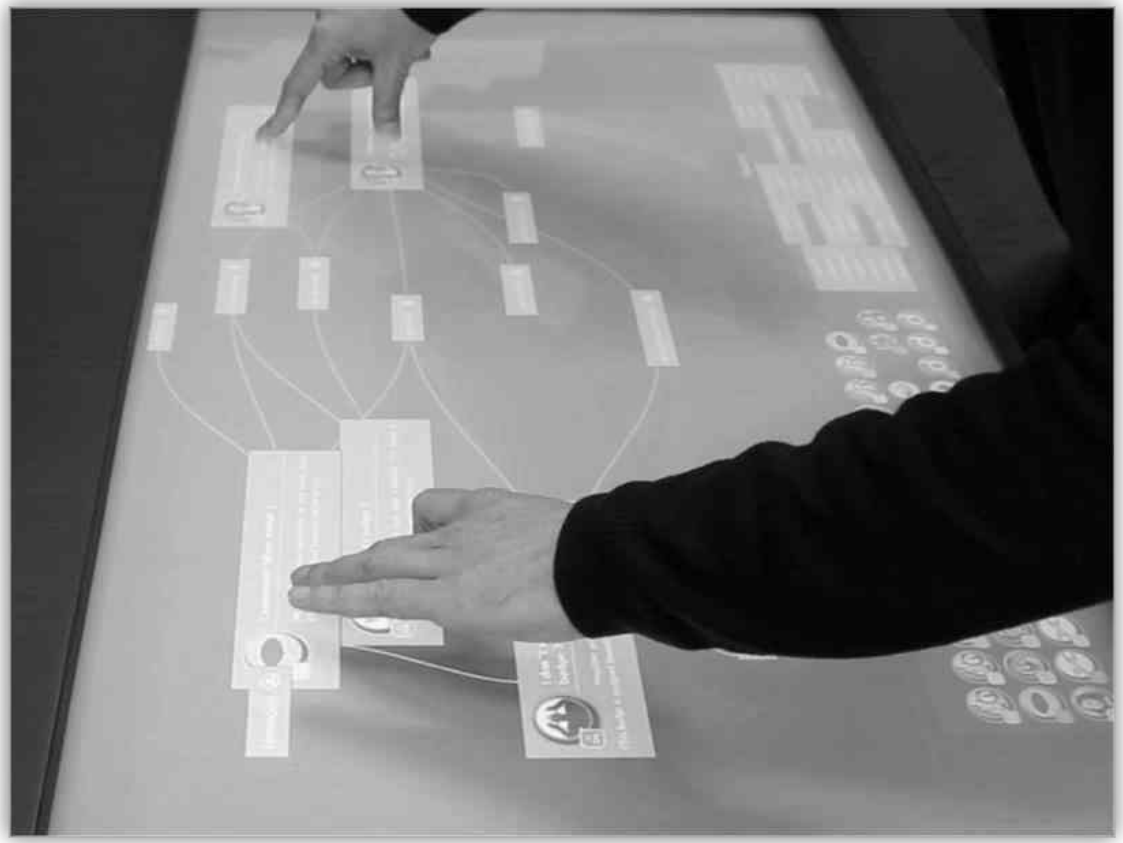
Collaboration



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Collaboration

Introduction to different case studies

Introduction

- there will be three case studies
- each group receives one case study
- each group will get 40 minutes to work on the case
- at the end present one striking result/challenge/question to everyone (2 min.)

Case 1

Case 11

Case III

Working on cases

Conclusion / Farewell