

## Learning analytics failathon

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Universiteit Leiden The Netherlands

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## Failathon\*

We show you our mistakes (and those of others) so you don't have to make them!

\*Term coined by Doug Clow, Rebecca Ferguson and Leah MacFadyen at a LAK conference.

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## SoLAR definition recap

According to SoLAR

'learning analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs'

(Siemens & Gašević, 2012)

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## Learning analytics, what...?!

The diagram illustrates the hierarchy of learning analytics components. At the top level is 'Institutional analytics/ Academic analytics'. Below it, a bracket groups 'Learning metrics' and 'Adoption analytics'. To the right of this group is 'Predictive'. Further down, another bracket groups 'Learning analytics' and 'Student analytics', which are then grouped under 'Reflective'. At the bottom level is 'Assessment analytics'.

Institutional analytics/ Academic analytics

Learning metrics      Adoption analytics      Predictive

Learning analytics      Student analytics      Reflective

Assessment analytics

Pictures from: [www.techniekbeeldbank.nu](http://www.techniekbeeldbank.nu) and [www.tudelft.nl](http://www.tudelft.nl)

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## Big data and educational datamining

Big Data: What is it?

Big Data is like teenage sex:

- Everyone talks about it
- Nobody really knows how to do it
- Everyone thinks everyone else is doing it
- So, everyone claims they are doing it.

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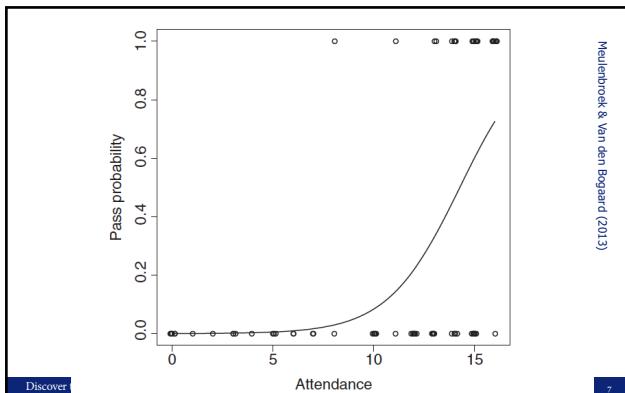
A line graph with 'uren' (hours) on the y-axis (0 to 25) and 'weken' (weeks) on the x-axis (0 to 15). The graph shows a low baseline with several sharp peaks. The first peak is around week 12, reaching approximately 18 hours. A second, much higher peak is labeled 'b' and reaches approximately 25 hours at week 14. A horizontal bar at the bottom indicates a break between weeks 12 and 14.

b

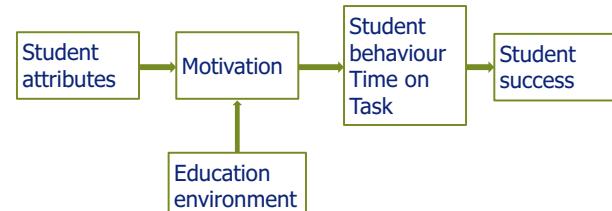
Time journaling research

Van der Drift en Vos (1987)

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### My fascination with Learning Analytics



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- Where do LA applications go wrong?
- Data push – Maartje's Blackboard data experiment, MOOC research
- Technology push – we have this cool tool, we have a solution you don't know you need, MAIS
- The tech suppliers continuity – Eesysoft, NTU tech supplier growing too fast: no service
- The dashboard drama – Signals Purdue,
- Intervention imminence –
- Total learning analytics solution – Upace
- The visualisation illusion – Student analytics Theo Bakker

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### E-Merge blackboard LA project (1)

- For two courses we collected data from Blackboard LMS in Delft.
- These courses were rich in use of Blackboard
- The aim was to use data mining techniques to find out what pages and elements in the LMS contributed to predicting success, to study the options for an early warning system.

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### E-Merge blackboard LA project (2)

		Output variables	N predictive variables	Thermodynamics course (Mech. Eng. BA1)
Predicting a fail	1 variable	64 % predicted correctly		n distinct sessions <= 13
	2 variables	69 % predicted correctly		n times access to content X <= 48 n distinct sessions <= 14
	3 variables	73 % predicted correctly		n times access to content X <= 48 average duration of the intervals between access in hours <= 424 n distinct sessions <= 14

Van den Bogaard, ME.D., De Vries, P. (2017)

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## The total LA solution: U-Pace



is an award winning (NUTN 2012) technology-enabled instructional approach developed at the University of Wisconsin-Milwaukee. The **U-Pace** instructional approach combines self-paced, **mastery-based learning** with **instructor-initiated Amplified Assistance** in an online learning environment.

How U-Pace's Core Components Produce Student Success

U-Pace's Core Components	Mediating Process	Observable Student Outcomes
Amplified Assistance Mastery-based Learning	Perceived Control over Learning	Greater Learning Academic Success

[www.uwm.edu/u/pace](http://www.uwm.edu/u/pace)

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## VU Student analytics (1)

Het data-onderzoek is uitgevoerd in drie stappen

De resultaten van de data analyses bouwden voort op elkaar

- Universitaire analyse
- Regression analyse
- Segmentatie-analyse

[www.slideshare.net/SAP\\_Nederland/thee-bakker-student-learning-analytics](http://www.slideshare.net/SAP_Nederland/thee-bakker-student-learning-analytics)

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## VU Student analytics (2)

Segmentatie (2/2) Op basis van de segmentatiekaart kunnen we een aantal algemene conclusies trekken over de groepen

Studiesucces is duidelijk verspreid over de kaart, uitvallers en switchers bevinden zich aan de linkerkant.

Bovenkant:

- Ongenoeg middelbare school: Meer westerse gebieden
- Ongenoeg middelbare school: Lagere inkomen
- Ongenoeg middelbare school: Meer niet-westerse allochtonen

Links:

- Universiteit: Hege inkval
- Minder diplomaverdienst
- Minder voorlichting voor start studie
- Meer voorlichting na start studie
- Meer mannen
- Oudere studenten (20+ j)

Rechts:

- Recheck ant: Onderwijsinterval
- Meer diplomaverdienst
- Meer voorlichting voor start studie
- Minder voorlichting na start studie
- Meer vrouwen
- Jongere studenten (17-19 j)

Onderkant:

- Ongenoeg: Meer westerse gebieden
- Ongenoeg: Hogere inkomen
- Ongenoeg: Minder niet-westerse allochtonen

[www.slideshare.net/SAP\\_Nederland/thee-bakker-student-learning-analytics](http://www.slideshare.net/SAP_Nederland/thee-bakker-student-learning-analytics)

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## Other elements where it can go wrong

- Data privacy
- Data security
- Data privacy: check out the privacy and LA guide from SURF!
- Technology push: no consulting with the user
- Third party suppliers
- And.....

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- Where do things go wrong: all great efforts with good intentions and most of the time rooted in the knowledge base. This work is not easy, like any innovation efforts: it takes a trial and error approach, where hopefully we can limit the trial and error cycle by learning from our own and other people's mistakes.
- To that end it is important to ask yourself what the active ingredients of your intervention are: where in the knowledge base can you position your intervention?
- Data push/ data mining, Wrong data: example Maartje Blackboard – Strandt al in de analyse!

**Why would it work?**

**Why didn't it work?**

**Can we position this in the existing knowledge base?**

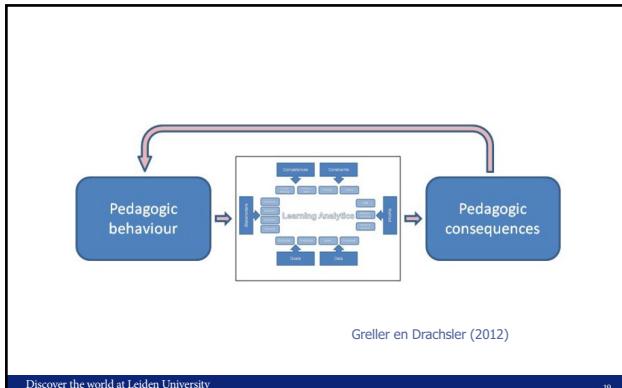
Example: Eesysoft: finding all the users, including all the support staff ☺. Ging ook mis omdat het bureau waar we mee werkten hun bedrijfsactiviteiten veranderden.

- Technology push Technology-driven innovations: learning record store van de UVA.
- Dashboards: example Signals student dashboard Purdue; the ones who needed it avoided it: Head Start Effect. Strandt in de interventie: 27% van de dashboards is gebaseerd op onderwijskundige principes (Olvet, et al 2017), bijna geen pedagogische focus.
- MOOC research – Voorbeeld? Strandt in veel aspecten, onder andere de toepasbaarheid/

**Kijken naar de 3% succesvolle afnorders,**

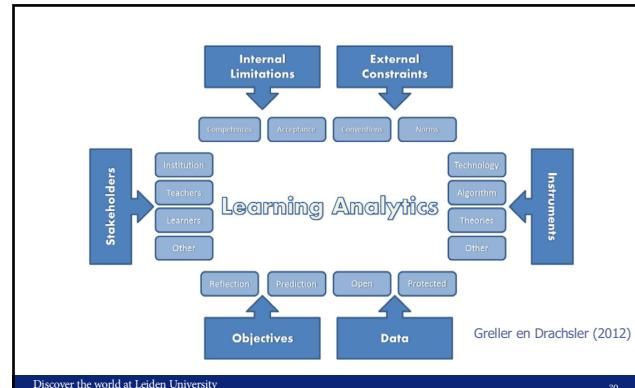
- Upace: successful all round application of mastery learning

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**"Learning analytics are about learning, not about analytics" \***

Take home message:

- Don't wait, get started!
- Use the data you already have and that you know how to interpret: small data analytics..
- Look for actionable data and a theory on why it will work. What are the active ingredients here?
- Know that it will be trial and error: be prepared to learn from your students why something does or does not work and be prepared to tinker.

\* Gašević, D., Dawson, S., Siemens, G (2017). Let's not forget: Learning analytics are about learning. *TechTrends*. (in press)

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**Thank you for your attention**

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