

Methodological Issues in Learning Analytics: Critical Insights and Reflections



Professor Mark Brown
ICDE Leadership Summit





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"They're the most futuristic," Prof Alan Smeaton talks
DARPA to the Irish Times

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President of the Big Data Value
Association visits Insight



what is big data ?



PredictEd: Using VLE Data to Provide Weekly Automated Feedback on Student Engagement

Owen Corrigan, Dr Mark Glynn, Prof Alan Smeaton, Dr Sinead Smyth

<http://y1feedback.ie/predicted-using-vle-data-to-provide-weekly-automated-feedback-on-student-engagement/>

Class Size

1100 students in year one
1370 for the second iteration

Discipline/Subject Area
Multi-Disciplinary

Feedback Approaches

Feed forward, learning analytics based automated feedback

Technologies

Institution VLE (Moodle), Institution Student Record System (ITS), student email, Course management system (Guru)

"PredictEd"

Mapping student engagement with the VLE to predict student success

Introduction

Data sources

Information for students

Results

Project Team

Publications



<https://predictedanalytics.wordpress.com>

Introduction

The aim of this website is to provide you with an overview of the learning analytics project "PredictEd" that is currently being conducted with 17 different first year modules within DCU. The work described in this project uses data generated from students' online behaviour, in order to improve their learning experience and specifically, their performance in end-of-semester written examinations. Using log data from the University's online virtual learning environment, Moodle, combined with past exam performance data we are able to build a software predictor which accurately classifies whether a student in the current cohort of students is likely to pass or fail the module.

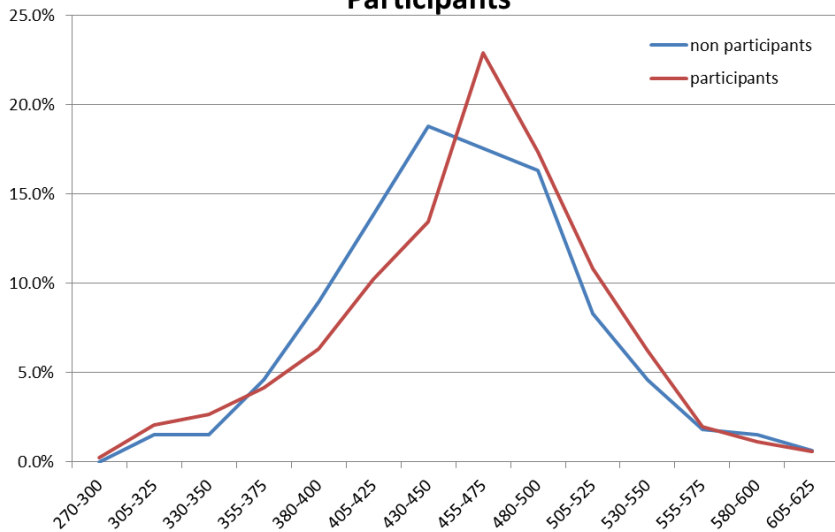
In short...

A pilot learning analytics project using LMS data on learner activity to provide direct **feedback** to students and lecturers during Semester.

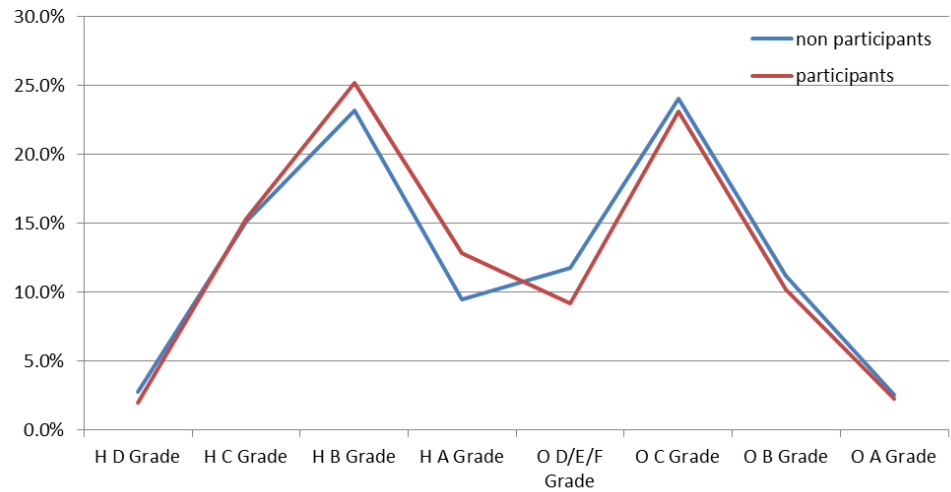
Participant Profile

No significant difference in the entry profiles of participants vs. non-participants overall

CAO Point Profile, *Predicted* Participants and non-Participants



LC Maths Attainment among *Predicted* Participants and non-Participants



Academic Performance

Average scores for participants are **higher** in 8 of the 10 modules analysed.

| Subject | Description | Non-Participant | Participant |
|-----------------------------------|---|-----------------|--------------|
| BE101 | Introduction to Cell Biology and Biochemistry | 58.89 | 62.05 |
| CA103 | Computer Systems | 70.28 | 71.34 |
| CA168 | Digital World | 63.81 | 65.26 |
| ES125 | Social&Personal Dev with Communication Skills | 67.00 | 66.46 |
| HR101 | Psychology in Organisations | 59.43 | 63.32 |
| LG101 | Introduction to Law | 53.33 | 54.85 |
| LG116 | Introduction to Politics | 45.68 | 44.85 |
| LG127 | Business Law | 60.57 | 61.82 |
| MS136 | Mathematics for Economics and Business | 60.78 | 69.35 |
| SS103 | Physiology for Health Sciences | 55.27 | 57.03 |
| Overall Dff in all modules | | 58.36 | 61.22 |

Survey findings...

| Question | Group 1 (more detailed email) | Group 2 |
|--|-------------------------------|------------------------|
| % of respondents who opted out of PredictED during the course of the semester | 4.5% | 4.5% |
| % who changed their LMS usage as a result of the weekly emails | 43.3% | 28.9% |
| % who would take part again/are offered and are taking part again | 72.2% (45.6%/ 26.6%) | 76.6% (46% /30.6%) |

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Software that helps to keep first-year students on track

All colleges help first-year students adapt, so they don't get overwhelmed or drop out. A novel project at DCU uses data to predict performance and sends students helpful weekly emails

 Mon, Aug 17, 2015, 15:00

Erin McGuire



 **NIDL**

National Institute
for Digital Learning



ExamWatch

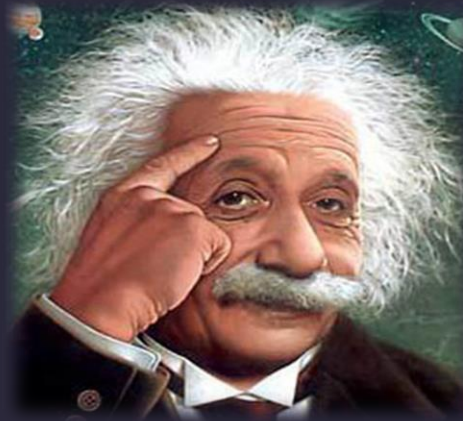
The Irish Times hub for the Leaving and Junior Certificate exams

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Three comments...



“Not everything that can be counted **counts**, not everything that counts can be **counted.**”



Albert Einstein

1. The Hype Gap



Learning Analytics: Utopia or Dystopia

Prof. dr. Paul A. Kirschner

Distinguished University Professor

Open University of the Netherlands

Welten Institute

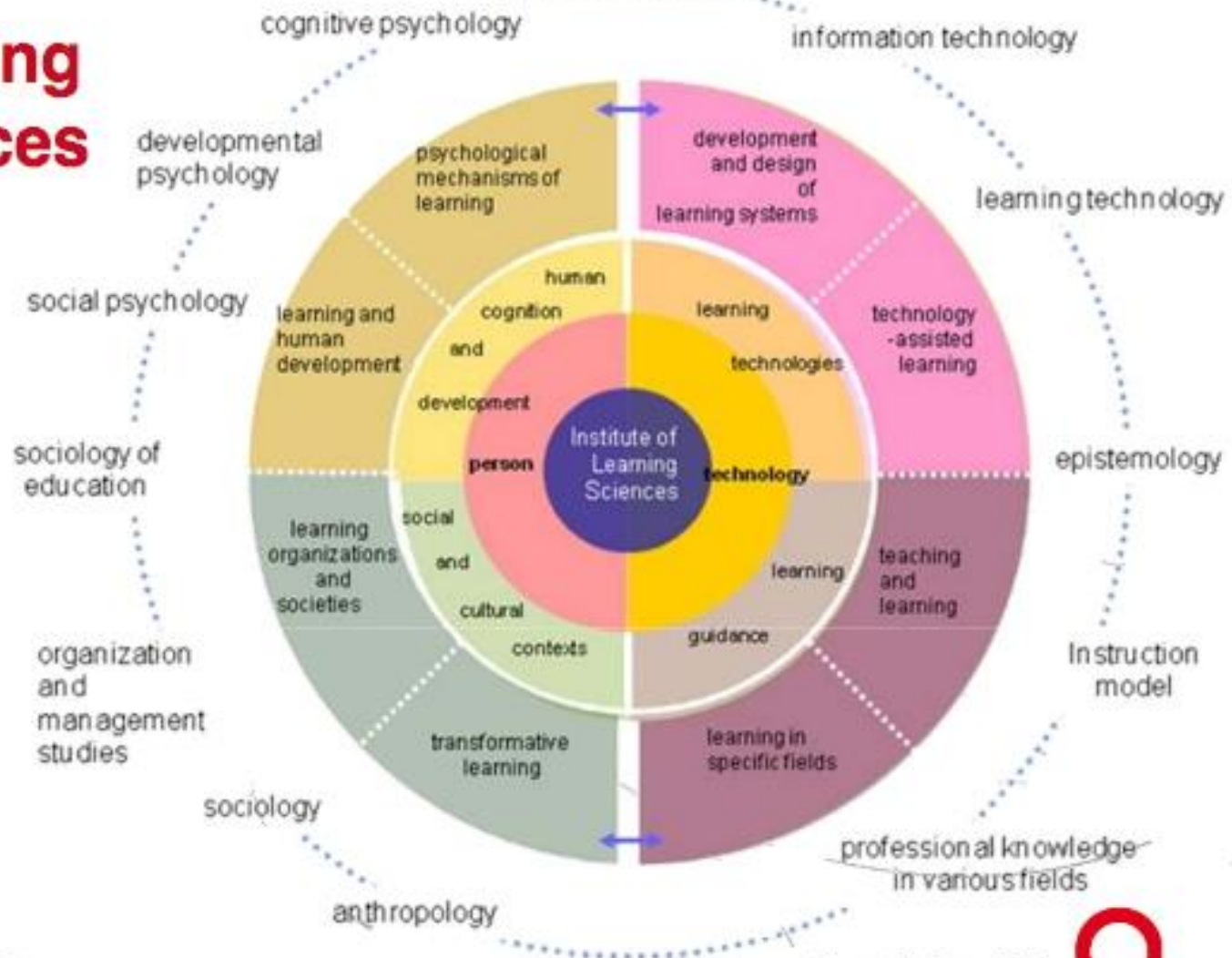
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Learning Sciences



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National Tsing Hua University

- (i) view education as a **simple process** that is easily modelled;
- (i) base decisions and interventions on data rich but **weak theory**;
- (i) inform decisions and interventions based on wrong or even **invalid variables**;
- (i) make interpretations and arrive at conclusions that confuse **correlations with causality**; and
- (i) result in unintended and **unwanted effects** that pigeonhole and stereotype learners which may be counterproductive to learner success.



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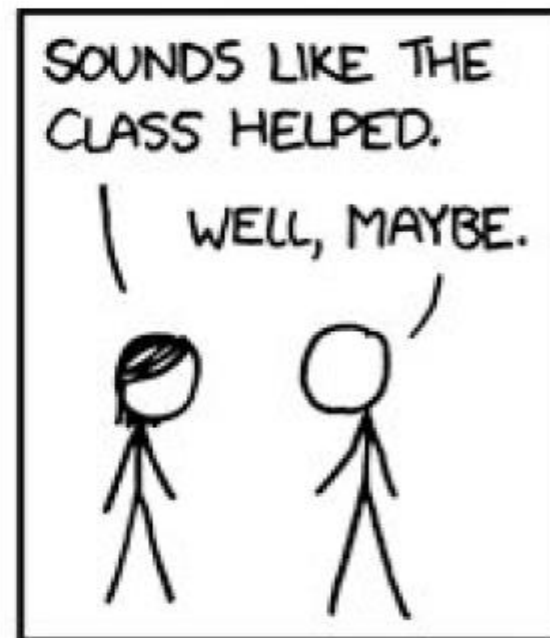
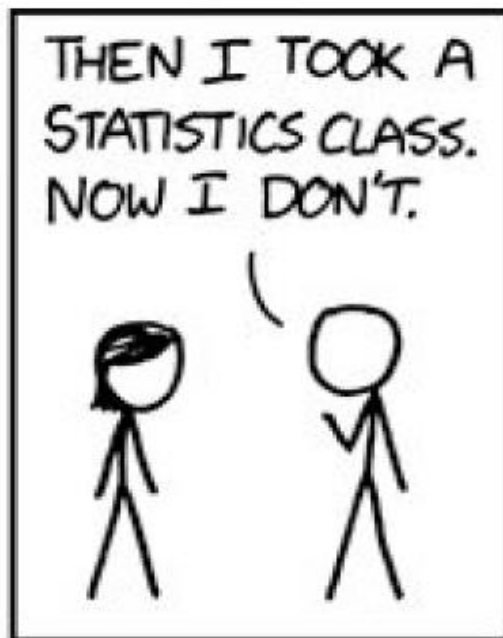
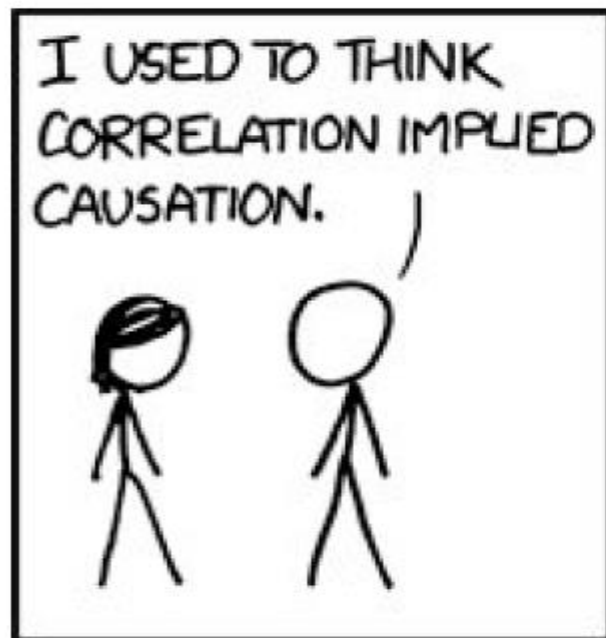
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Software that helps to keep first-year students on track



2. Novelty and Impact Bias





Learning
is like
chewing gum
(messy)

VS.



Allen, K., Galvis, D., Katz R. (2004). Evaluation of CDs and chewing gum in teaching dental anatomy. *Journal of Dental Research*, 83.

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Sharing successes and hiding failures: 'reporting bias' in learning and teaching research

Phillip Dawson^a and Samantha L. Dawson^{b,c}

^aCentre for Research in Assessment and Digital Learning (CRADLE), Deakin University, Geelong, Australia; ^bIMPACT SRC, School of Medicine, Deakin University, Geelong, Australia; ^cEarly Life Epigenetics, Murdoch Childrens Research Institute, Royal Children's Hospital, Parkville, Australia

ABSTRACT

When researchers selectively report significant positive results, and omit non-significant or negative results, the published literature skews in a particular direction. This is called 'reporting bias', and it can cause both casual readers and meta-analysts to develop an inaccurate understanding of the efficacy of an intervention. This paper identifies potential reporting bias in a recent high-profile higher education meta-analysis. It then examines a range of potential factors that may make higher education learning and teaching research particularly susceptible to reporting bias. These include the fuzzy boundaries between learning and teaching research, scholarship and teaching; the positive agendas of 'learning and teaching' funding bodies; methodological issues; and para-academic researchers in roles without tenure or academic freedom. Recommendations are provided for how researchers, journals, funders, ethics committees and universities can reduce reporting bias.

KEYWORDS

Reporting bias; publication bias; research synthesis; academic freedom; Scholarship of Teaching and Learning

3. Border Crossing the Literature



What Works? Student Retention & Success



Supporting student success: strategies for institutional change

What Works? Student Retention & Success programme

Final Report

By Professor Liz Thomas

Michael Hill

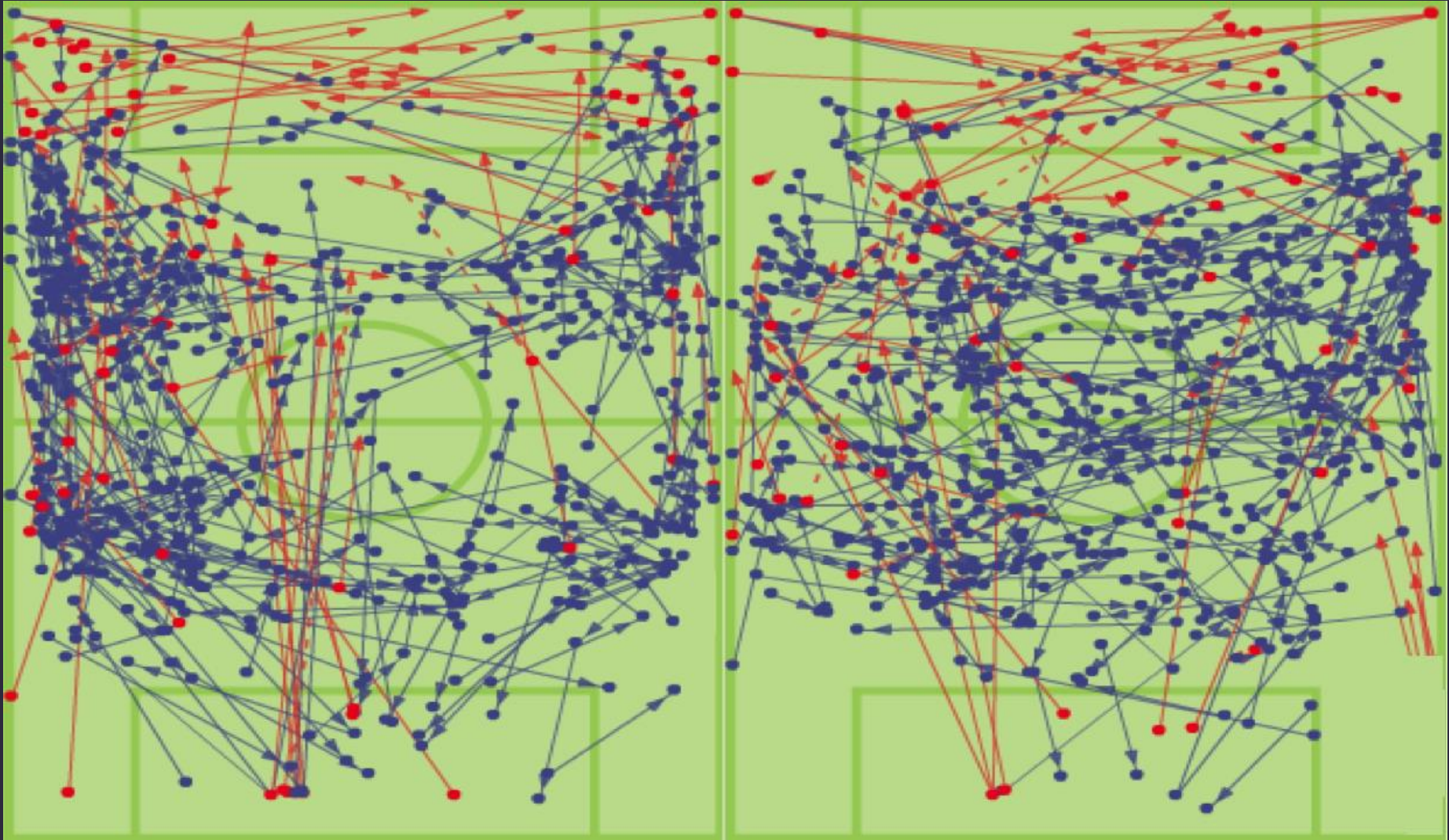
Dr Joan O' Mahony

Professor Mantz Yorke

April 2017



Performance takes place in the Network



Beyond hard outcomes: ‘soft’ outcomes and engagement as student success

Nick Zepke* and Linda Leach

School of Educational Studies, College of Education, Massey University, New Zealand

This paper questions current policy discourses that equate student success with hard outcomes like retention, completion and employment. It offers another view, one that uses ‘soft’ outcomes and student engagement literature to widen our understanding of student success. In the paper, we first draw on literature to explore student engagement, usually understood as a means to achieve success, and ‘soft’ outcomes as acceptable student outcomes, as success. We present possible indicators for these forms of success and a matrix of factors which influence such success. We then examine these ideas using data gathered from a project that investigated success as experienced by post-school foundation learners in Institutes of Technology and Polytechnics in Aotearoa/New Zealand. The findings suggest that the ideas have value. Finally, we identify some implications for teachers, arguing that, contrary to some current views, all four quadrants in the matrix are the business of teachers.

<http://studentsuccess.ie>



Student Success Toolbox



Lost in Transition: A Report on Enabling Success for Flexible Learners

Conclusion

Conclusion



LACE

learning analytics
community exchange

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About Lace

Learning Analytics Community Exchange

The Learning Analytics Community Exchange is an EU funded project in the 7th Framework Programme involving nine partners from across Europe. LACE partners are passionate about the opportunities afforded by current and future views of learning analytics (LA) and educational data mining (EDM) but we are concerned about missed opportunities and failing to realise value. The 30 month project aims to integrate communities working on LA and EDM from schools, workplace and universities by sharing effective solutions to real problems.

Using data wisely for education futures



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“A prudent question is one-half of wisdom”

Francis Bacon



<http://www.slideshare.net/mbrownz>

Questions...



Ollscoil Chathair Baile Átha Cliath
Dublin City University

Professor Mark Brown

Director, National Institute for Digital Learning



mark.brown@dcu.ie



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