Doing learning analytics in higher education
-Critical issues for adoption & implementation-

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Learning Analytics Network
University of Edinburgh and JISC
Growing demand for education!
Feedback loops between students and instructors are missing/weak!
Learning environment

Educators  
Student Information Systems 

Learners
Learning Analytics – What?

Measurement, collection, analysis, and reporting of data about learners and their contexts
Learning Analytics – Why?

Understanding and optimising learning and the environments in which learning occurs
CASE STUDIES
Student retention

Can teaching be improved?

Learning Analytics (LA) has been identified as one of the top technology trends in higher education today (Tobias et al., 2013). LA is based on the idea that data sets generated through normal administrative, teaching, or learning activities—such as registrar data or interactions with learning management systems—can be analyzed to enhance student learning, academic progress, and teaching practice.

Examples of LA projects in colleges and universities include Purdue University’s “Course Signals” system, an early-alert notification for struggling students, and Austin Peay State University’s “Degree Compass,” a course recommender program based on predictive analytics.

Although the promise of LA is great, key areas of the approach have been identified as needing to be better realized (Drigelis, 2012). The key challenge is utilizing large data sets for actionable and effective interventions in the classroom—that is, enabling “faculty to more precisely identify student learning needs and tailor instruction appropriately” (Johnson et al., 2011, p. 28).

Here, we describe one large-scale LA initiative at the University of Michigan (U-M) to improve performance for thousands of students in gateway physics courses. Our goal is not only to describe the development and implementation of this unique initiative in STEM education but also to discuss how the approach we used can help meet some of the challenges to more widespread LA adoption.
Hello Kate!

Welcome to your ECoach site. We'll be here every step of the way to help you work towards your goal of succeeding in Physics 240.

Motivation for Engineering Students

It's especially important for you to do well because you'll use physics as a Chemical Engineering major. As an engineer, you may have people's lives in your hands. They'll be counting on you to get the physics right when you design a steering mechanism, a bridge, or a replacement hip. Being a responsible professional starts here!

You can turn to us for advice about using your study time effectively, the best approaches to studying for exams, and available resources to you.

Desired Grade

You told us that the grade you want to receive is a B. This is a good goal for you—you should be more confident that you can achieve this! We think you can! In fact, we've seen students come in unsure about their success and receive a B that you want. However, you should know that confidence does matter! We want you to go into each exam sure that you can do well. What if you aim for an even higher grade? Keeping in mind that you're usually an A student with a GPA of 3.6, come up with a new, higher goal that will push you to do even better. ECoach will be here every step of the way to help you as you embark on this goal.

Where Does Physics Fit?

You told us that you value relationships with family and friends, learning and gaining knowledge and sense of humor. You also reported that you are involved with student clubs or organizations. This is on top of the work associated with your other classes. There is a way to make physics fit into this mix. Let's figure out what works for you.

We see that you have many strengths coming into this class. Some of the most important are:

- You're already in your second semester of physics in college—you understand what's expected of you.
- You're prepared to spend 12 hours per week preparing for class, working on homework and studying.
- Physics is applicable to your everyday life—there are examples all around you.

There are also some factors that could be potential challenges for you. These may include:

- Physics is a difficult subject for anyone to master.
- You said that you're not taking this course because you're interested—hopefully you'll find a topic that you find exciting.
- You don't know anyone else in this class yet.

You should know that lots of people come in with these challenges and do great. ECoach will draw on this knowledge of your strengths and weaknesses to recommend study techniques that are tailored to your specific needs. If you follow this advice and put in a lot of hard work, you can do well in this course too!

INSTITUTIONAL ADOPTION: CURRENT STATE
Very few institution-wide examples of adoption
~70% institutions in phase 1


305 institutions, 58% at stage 1, 20% at stage 2

Interest in analytics is high, but many institutions had yet to make progress beyond basic reporting

What’s necessary to move forward?
DIRECTIONS
Data – Model – Transform

Data – Model – Transform

Creative data sourcing

Necessary IT support

Data – Model – Transform

Question-driven, not data-driven

HAVING CONDUCTED A COMPREHENSIVE ANALYSIS OF DOZENS OF SUBSETS OF DATA FROM A WIDE RANGE OF SOURCES WE’VE CONFIRMED THAT THE LIKELY ANSWER IS 36....NOW WE JUST NEED TO IDENTIFY THE QUESTION!
Learning analytics is about learning
Instructional conditions

Model 1 – demographic and socio-economic variables
* - not statistically significant

Once size fits all does not work in learning analytics
Data – Model – Transform

Participatory design of analytics tools
Analytics tools for non-statistics experts
Develop capabilities to exploit (big) data

Visualizations can be harmful

What’s our reality?
CHALLENGES
Current state

Benchmarking learning analytics status, policy and practices for Australian universities
Senior management perspective
Senior management perspective
Solution-driven approach

Bought an analytics product.

Analytics box ticked!
Lack of data-informed decision making culture

Researchers not focused on scalability
FINAL REMARKS
Embracing complexity of educational systems
Rapid Outcome Mapping Approach (ROMA)

1. Map political context
2. Identify key stakeholders
3. Identify desired behaviour changes
4. Develop engagement strategy
5. Analyse internal capacity to effect change
6. Establish monitoring and learning frameworks

Define (and re-define) your policy objectives

Capacity development

Multidisciplinary teams in institutions critical
Learning from the successful examples
An institutional learning analytics vision

Cross-institutional experience sharing & collaboration
Open Learning Analytics: an integrated & modularized platform
Proposal to design, implement and evaluate an open platform
to integrate heterogeneous learning analytics techniques

http://solaresearch.org

Learning Analytics Initiative

http://www.apereo.org/
Ethical and privacy consideration
Ethical use of Student Data for Learning Analytics Policy

This policy aims to set out how the University will use student data in an ethical way in order to shape the student support provided. The policy is based around eight key principles, each of which is linked to particular aspects of learning analytics.

- Policy on Ethical use of Student Data for Learning Analytics (125KB)
- Ethical use of Student Data for Learning Analytics Policy FAQs (122KB)
- Using information to support student learning (427KB)

Charter Principle:
We treat each other with dignity and respect

Development of analytics culture

Thank you!