Faculty Use of Learning Analytics Dashboards

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Getting Faculty Members to Embrace Student Data

Pierce College has improved graduation rates by breaking down student success, course by course

By Ben Gose | OCTOBER 1, 2017

Seeing students at scale: how faculty in large lecture courses act upon learning analytics dashboard data

Michael Brown | OCTOBER 1, 2017

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ABSTRACT

Despite their increasingly widespread adoption in post-secondary education, scholars and practitioners know very little about the impact of digital data displays on instructors’ sense-making and academic planning. In this manuscript, I report the results of comparative case studies of five different introductory physics instructors at three institutions who used data dashboards as part of an active learning approach called ‘Peer Instruction’. Instructors expressed frustration with the ways that data displays undermined their existing pedagogical strategies. They were stymied by a lack of clarity on how data is assembled and imbued with meaning, which limited their own sensemaking about the data. They also expressed concerns about how the dashboards facilitated data collection about their instructional planning and decision-making.

certificate programs except those in teaching; 2) Masters programs; and 3) Doctoral programs.

NOTE: Access to the Dashboards is restricted to current full-time faculty only. To request access, submit a request to the CSED Office of Assessment at casedasessment@pusa.edu.
How often do faculty/instructors at your institution use digital learning data to inform course-level interventions, pedagogical approaches, or design?
How often do faculty/instructors at your institution use digital learning data to inform course-level interventions, pedagogical approaches, or design?

- Rarely: 57%
- Sometimes: 29%
- Never: 14%
- Often: 0%
- Consistently: 0%
How do faculty/instructors get access to digital learning data generated in the courses that they teach?
How do faculty/instructors get access to digital learning data generated in the courses that they teach?
So what exactly is a dashboard?
What is a learning dashboard?
“A learning dashboard is a single display that aggregates different indicators about learner(s), learning process(es) and/or learning context(s) into one or multiple visualisations” (p. 37).

https://doi.org/10.1109/TLT.2016.2599522
Learning dashboards “typically capture and visualize traces of learning activities, in order to promote awareness, reflection, and sense-making, and enable learners to define goals and track progress toward these goals” (p. 1499).
Early Research on LA Dashboards

- “Visualization and prediction techniques”

Present Research on LA Dashboards

- “Participatory design methods to tailor... to the needs of stakeholders, employs multimodal data acquisition techniques, and starts to research the theoretical underpinnings…” (p. 35).

### Early Dashboards (log/trace data; teacher/student focus)
- Blended settings
- Self-reflection
- Engagement
- Student interaction
- At-risk prediction
- Group work facilitation
- Social comparison (p. 36)

### Challenges (p. 38)
- One-size-fits-all mentality
- Understanding the data presented
- Psychological research
- Participatory design
- Personalization/Context
- Misrepresentation
- Actionability
- Theoretical underpinning

A recent review suggests that current dashboards:

- Are rarely grounded in learning theory (~32%)
- Do not support metacognition
- Do not inform effective learning strategies
- Have underexplored evaluation and minimal design-based research

Interestingly, the frequency of student views did not impact outcomes

- Most prevalent visualization = bar charts on group average score comparison
- Require “Strong interdisciplinary teams [with] expertise in learning sciences, human-informed interaction, design, and research methods” (p. 241).

What types of learning dashboards do you have at your institution? (can select more than one)
### What types of learning dashboards do you have at your institution? (can select more than one)

- **Learning Management Systems (ex: Canvas, Blackboard)**: 69%
- **Homegrown/Institution-Created**: 31%
- **Publisher Content (ex: McGraw Hill Connect, Pearson MyLab)**: 23%
- **We do not have them**: 15%
- **3rd-Party Analytics Platforms (ex: Civitas, Unizin)**: 8%
- **Adaptive Courseware (ex: AcroBatiq, ALEKS)**: 8%
- **Other EdTech Vendor Products**: 0%
When are dashboards successful for students?

- Understanding student needs
- Data is understandable
- Dashboard is perceived as useful
- Feedback is personalized
- Training/support is provided


How can dashboards be successful for students?

- To promote student sense-making and self-regulation, considerations include:
  - Transparency of design (elements, calculations, alignment, and scales explained)
    - Support at different levels
  - Data/reference frames (completed activities, how to learn, comparisons, outcome predictions)
    - Need to fit learner goals
  - Support of action (information to plan learning, changing behaviors, content to review)
    - Move from passive to actionable

How can dashboards be successful for students?

- Move away from one-size-fits-all
  - One way to achieve this is by incorporating other data sources (ex: Student Information Systems)
  - Messaging is important:
    - “students’ comparisons with others who perform worse (downward comparison) have been shown to lead to feelings of superiority and positive affect (Major et al. 1991) while comparisons with others who perform better (upward comparisons) can evoke negative affect and lower academic self-concept (Dijkstra et al., 2008)” (p. 382).
    - “Winstone et al. (2016) caution ‘Inevitably, the benefits of receiving feedback are not uniform across all circumstances, so it is imperative to understand how these gains can be maximized’ (p. 1).” (p. 382).

Far less research on faculty use...

- Also, faculty often do not get a choice about what is shown to students or the ability to provide feedback, but some institutions are moving that direction.

**Dashboards for Data-Informed Action**

**Instructional Dashboard Teaching Practices**

This project is a multi-faceted partnership of LEARN with NYU IT Teaching and Learning with Technology (TLT) around the instructional support dashboards that TLT is developing for NYU faculty. LEARN conducted research on how faculty worked with early versions of the dashboards to inform their teaching and course design; is actively engaged in developing pedagogical training materials for faculty and supporting workshops on the active use of dashboards in teaching and course redesign; and participates in a working group to evaluate dashboard usability and fitness, with the goal of improving dashboard functionality.
Faculty Dashboard from a Courseware
K-12 teacher studies are useful

- One showed a dashboard’s impact on pedagogy as well as process and task feedback (minimal personal, social, or metacognitive feedback)
- More frequent dashboard interaction = more diverse pedagogical knowledge
- Perceived ease of learning analytics tools = low
- Significant training and support needed


Faculty frequently indicate dashboard data is overwhelming and not often used. In the Faculty Learning communities, teaching & learning staff identified common challenges and best use of dashboards.
How might you or faculty/instructors at your institution use a learning analytics dashboard?
Thanks for joining us!
Questions?

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Resources shared in the chat

Learning Analytics Strategy Toolkit (Every Learner Everywhere)

Case: Dashboard Data for Mid-Stream Adjustments (Every Learner Everywhere)

Creating Data for Learning Analytics Ecosystems (Society for LA Research)

OnTask Learning Website

UCF OLC Accelerate 2020 Session on their adaptive learning research

- Contact patsy.moskal@ucf.edu if you want more information!
Colorado State University Dashboard Challenge

Due to the infrequent use of the analytic dashboard in most of our participating courses, we decided to issue the Dashboard Challenge to our Faculty Collaboration Group in March 2019. Faculty were told that there would be a small prize for their participation. The goal was for faculty to choose one dashboard report to follow during the second half of the semester (March 25 – May 6) and record their interventions with students. To get faculty started, we recommended that faculty follow the Most Challenging Content/Activities (LearnSmart & Wiley) or the At-Risk Performance Report (LearnSmart); one faculty member followed the Pie Chart Topic Completion Report in ALEKS.

Since program managers were also teaching courses using adaptive platforms, they kept track of their weekly use of one analytics report for six weeks as a model for six faculty. Faculty from accounting, biology and chemistry participated in the challenge and recorded their weekly use on a google spreadsheet. Faculty also reported back on their experience to the group during the May Faculty Collaboration Meeting. Even though we have talked about the dashboard at previous meetings and consultations, this challenge seemed to garner far more interest and conversation among faculty than did earlier discussions.