Using data visualization to monitor resident learning progress in CBD

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Je n’ai aucune affiliation (financière ou autre) avec une entreprise pharmaceutique, un fabricant d’appareils médicaux ou un cabinet de communication.
Background – CBME at U of T

- U of T implemented Competency by Design starting with two programs in 2017

- Entrustable Professional Activities (EPAs)
  - Clinical activities that are carried out in day-to-day practice and together constitute that mass of critical elements that operationally define a profession
  - Instructors assess EPAs and entrust responsibility of trainees’ readiness to perform these activities independently
  - EPAs collected per resident per year range from 20 to 200

- Delivered in an on-line format using Elentra beginning in 2018

- Centrally co-ordinated and supported by Systems and Education Support team at PGME

1. Ten Cate, O. and Scheele, F. (June 2007). Competency-Based Postgraduate Training: Can We Bridge the Gap between Theory and Clinical
Methods

- Due to the rapidly increasing numbers of EPA assessment data being collected, new approaches and tools were required to easily understand, analyze and visualize resident data.

- U of T developed dashboards to visualize, in a meaningful way, different indicators on learners’ performance and the clinical context of the assessment in order to support decision making by Program Directors and Competency Committee Members.

- EPA assessment data are retrieved from Elentra, cleaned, and connected to Tableau.
Methods

- **Tableau** is a data-visualization software:
  - handle **large amounts of data**
  - use different visualization options
  - incorporate **qualitative and quantitative** data
  - allows users multiple ways to **interact** with the data using filters and tooltip
  - Tableau Server facilitates access in a secure environment
Development Process: Prototype (2018-19)

The design process involved **consultation** with Learning Analytics experts.

**Review of literature** on learning analytics and data visualization.

Dedicated two individuals to becoming local experts and participate in a **train-the-trainer model**.

**Iterative** process.
Prototype
Learning from Prototype

Feedback:
- individual Program Directors/Program Administrators
- CBME leads
- Competency Committee Members

Extensive Consultation with the Best Practices for Evaluation and Assessment (BPEA) Useability Committee through an open and transparent process

Key Issues:
- Data overload
- Visuals difficult to understand
- Required too many interactions from end-user
Benefits of our Learning Analytics Approach

- Flexibility
- Detect gaps in early stages
- Iterative approach
- User friendly platform
- Continuous improvement
Implications

- Learning Analytics is a **new science** for medical education
- More research needed to ensure **data validity**
- **Additional uses** - program evaluation, faculty performance, etc.
Next Steps

- Tableau Dashboards originally intended to be temporary method of visualizing learner progress.
- Incorporating other assessment data such as: ITARs, MCQs, OSCE, etc. from various platforms.
- Designing dashboards for other users such as: learners, site/rotation coordinators, faculty, etc.
- Developing strategies for a “data warehouse”
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