Got Data—Now What?: Synthesizing Outcomes, Measures, And Success To Inform Institution-Wide Decision Making

- Jennifer M. Harrison • Associate Director for Assessment • Faculty Development Center •
- Sherri N. Braxton • Senior Director of Instructional Technology •
- University of Maryland, Baltimore County •
This session defines student success through a gamified exercise, delving into technologies that collect and manage data, and preparing participants to lead data discussions. Our dashboarding activity challenges attendees to classify student success indicators, practice bridging direct and indirect evidence, and collaborate to synthesize meaning from real-world institutional problems.
1. What is your role?

A. Administrator
B. Instructional Technologist/Designer
C. Faculty
D. Other
2. What technologies do you use?

A. Learning Management System (LMS)
B. Assessment Management System (AMS)
C. Student Information Systems (SIS)
D. Other
3. What assessment challenge are you trying to solve with technology?

A. Collecting
B. Connecting
C. Analyzing
D. Closing the Loop
4. Who can help you?

A. Instructional Technology Expert
B. Assessment Expert
C. Institutional Research Expert
D. Other
5. Which student success indicator is most important for your work?

A. Direct Evidence of Student Learning

B. Grades

C. Retention & Graduation Rates

D. Other
When we complete this session, we will be able to ...

Create a dashboard of student success indicators as a visual guide to model effective data integration

Collaborate to analyze those indicators and practice facilitating closing-the-loop discussions that yield effective interventions through scenarios that include multiple direct and indirect data points

Identify gaps in your institution’s assessment processes and technologies that hinder the data collection, analysis, and aggregation required to take outcome data to scale
Key Terms

Outcomes
Analytics
Indicators

Direct Learning Data
Indirect Learning Data
Indirect Learning Data

Intervention
Dashboard
Data-Driven Decision Making
Why should we collect, analyze, and apply assessment data?

Learning Outcomes Data + Learning Analytics Data = Demonstrate Mission
Direct Evidence
- e.g., Rubrics, Portfolios, Exams, Clickers

Indirect Evidence
- e.g., Retention, Grades, Clickstream Data

Learning Management System

Student Information System

Assessment Management System

Data Warehouse

Data Analysis Tools

Student Learning & Success
Indirect Evidence

- Student Surveys
- Grades
- Exit Interview Data
- Retention & Persistence Data
- Cardswipe Engagement Data
- Graduation Rates
- Click-stream Data
- Grades
At UMBC ...

- REX DW
  - Data Sources
    - LRC, RT, etc.
    - PS, Fin, HR, SA
    - Bb, myUMBC R25, etc.
  - Interventions (KSMtx)
  - IPASS
  - FYI Alerts
  - Tutoring (LRC, SI)
  - Civitas
  - Analysis
  - EAB
  - Reporting
    - RS (guided)
    - Direct SQL Access
    - Pyramid (explore)
    - Bb Predict
At UMBC ...

Level 5
- Dashboards
- Advising
- Planner
- iPASS

Level 4
- Measurement Tools
- Predictive Analytics
- SSMx – Intervention catalog
- Early Alert

Level 3
- Business Intelligence System – integration of data

Level 2
- LMS
- SaaS Applications

Level 1
- Finance
- HR
- Student

Data Analysis Tools
Data Warehouse
Learning Management System
Assessment Management System
Student Information System
Overview
Technology Solutions for Assessment
Technology Solutions for Assessment

National Institute for Learning Outcomes Assessment
September 2016

Technology Solutions to Support Assessment

Jennifer M. Harrison and Sherri N. Braxton

Occasional Paper #35
www.learningoutcomesassessment.org

Taxonomy
Process
Rubric
What tools, systems, and/or technologies do you use?

What function(s) do they perform?
What functions do your tools offer?

Collecting  
Connecting  
Organizing

Archiving  
Analyzing  
Communicating

Closing the Loop
<table>
<thead>
<tr>
<th>Taxonomy/Tool</th>
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\( x \) = provides all capabilities of category;  \( * \) = provides at least one of the capabilities of the category
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X = provides all capabilities of category; * = provides at least one of the capabilities of the category
### At UMBC ...

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$X = \text{provides all capabilities of category}; \quad * = \text{provides at least one of the capabilities of the category}$
Planning for Assessment Technologies

Clarify Common Ground

How do outcomes at each level align to the mission?

Use Backward Design

What direct evidence do you need to demonstrate learning?

Take Inventory

What processes and technologies are already in place?
Planning for Assessment Technologies

---

**Identify Audiences**

Who needs to know about student learning? What are their questions?

---

**Seek Expert Advice**

Who has expertise in assessment, instructional technology, and analytics?

---

**Form a Team**

Who can evaluate and test potential technology solutions?
<table>
<thead>
<tr>
<th><strong>Criteria</strong></th>
<th><strong>Questions to Consider</strong></th>
</tr>
</thead>
</table>
| **Usability** | ✤ Is the software intuitive and easy to use? (Will users need extensive training?)
|               | ✤ Does it work well with software we already have (and are using)?
|               | ✤ Does it require additional steps/staff to enter and extract data?
|               | ✤ Does it make assessment feel like an add-on? Or does it make assessment work part of the teaching and learning process?
|               | ✤ Does data export in a usable format? Is it IMS Global Learning Tools Interoperable (LTI)?
|               | ✤ What about accessibility? |
## Functionality

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Questions to Consider</th>
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<tbody>
<tr>
<td>Does the software reflect best practices in assessment?</td>
<td>✧</td>
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<tr>
<td>Can it manage multiple levels of assessment?</td>
<td>✧</td>
</tr>
<tr>
<td>Does it help users create and align outcomes?</td>
<td>✧</td>
</tr>
<tr>
<td>Does it walk users through curriculum mapping and rubric development?</td>
<td>✧</td>
</tr>
<tr>
<td>Does it offer easy-to-use reports and dashboards customizable to audience needs?</td>
<td>✧</td>
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<tr>
<td><strong>Criteria</strong></td>
<td><strong>Questions to Consider</strong></td>
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<tr>
<td>Costs</td>
<td>✦ How much is the annual software license?</td>
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<td>✦ Are updates included? If not, how much will they cost?</td>
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<td>✦ How much will it cost for support and training?</td>
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<td>✦ What hardware/cloud costs are needed to support it?</td>
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<td>✦ What hidden costs might emerge?</td>
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</table>
# Audiences

<table>
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<th>Criteria</th>
<th>Questions to Consider</th>
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<tbody>
<tr>
<td>Audiences</td>
<td>✩ Who will need to use this software?</td>
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<td>✩ How will they learn to use it?</td>
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<td>✩ What questions can they answer with this tool?</td>
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<tr>
<td>Criteria</td>
<td>Questions to Consider</td>
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</table>
| Flexibility | ✦ Is the software flexible enough to meet your needs?  
               ✦ How will the system grow with your institution?  
               ✦ How will the system adapt to anticipated (and unforeseen) changes in assessment demands? |
## Bridging Education Data

<table>
<thead>
<tr>
<th>Taxonomy/Tool</th>
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<tr>
<td>RedCard Swipe Data (CSJ, etc.)</td>
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</tbody>
</table>
2(a) The teacher designs, adapts, and delivers instruction to address each student's diverse learning strengths and needs and creates opportunities for students to demonstrate their learning in different ways.

2(e) The teacher incorporates tools of language development into planning and instruction, including strategies for making content accessible to English language learners and for evaluating and supporting their development of English proficiency.

2(f) The teacher accesses resources, supports, and specialized assistance and services to meet particular learning differences or needs.

4(b) The teacher engages students in learning experiences in the discipline(s) that encourage learners to understand, question, and analyze ideas from diverse perspectives so that they master the content.

<table>
<thead>
<tr>
<th></th>
<th>Mentor-Teacher Rating</th>
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<td>2(a)</td>
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<td>2(e)</td>
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<td>2(f)</td>
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<td>4(b)</td>
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### Course Results Confirm Gap

#### Education 602
Summer 2015 Multicultural Classroom Rubric Results

\[ n = 11 \]

<table>
<thead>
<tr>
<th></th>
<th>2(a) The teacher designs, adapts, and delivers instruction to address each student's diverse learning strengths and needs and creates opportunities for students to demonstrate their learning in different ways. Row 1</th>
<th>2(e) The teacher incorporates tools of language development into planning and instruction, including strategies for making content accessible to English language learners and for evaluating and supporting their development of English proficiency. Row 2</th>
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<th>4(b) The teacher engages students in learning experiences in the discipline(s) that encourage learners to understand, question, and analyze ideas from diverse perspectives so that they master the content. Row 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proficient</td>
<td>36%</td>
<td>55%</td>
<td>9%</td>
<td>0%</td>
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<tr>
<td>Competent</td>
<td>64%</td>
<td>45%</td>
<td>55%</td>
<td>18%</td>
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<tr>
<td>Novice</td>
<td>0%</td>
<td>0%</td>
<td>36%</td>
<td>82%</td>
</tr>
</tbody>
</table>

### Education 602 Rubric Results

- **Proficient**: 36% for Row 1, 55% for Row 2, 9% for Row 3, 0% for Row 4
- **Competent**: 64% for Row 1, 45% for Row 2, 55% for Row 3, 18% for Row 4
- **Novice**: 0% for Row 1, 0% for Row 2, 36% for Row 3, 82% for Row 4

The results indicate that the teacher is performing well in integrating diverse learning strategies and resources, but could improve in the areas of accessing specialized assistance and engaging students in diverse perspectives.
The teacher designs, adapts, and delivers instruction to address each student's diverse learning strengths and needs and creates opportunities for students to demonstrate their learning in different ways. Row 1

The teacher incorporates tools of language development into planning and instruction, including strategies for making content accessible to English language learners and for evaluating and supporting their development of English proficiency. Row 2

The teacher accesses resources, supports, and specialized assistance and services to meet particular learning differences or needs. Row 4

The teacher engages students in learning experiences in the discipline(s) that encourage learners to understand, question, and analyze ideas from diverse perspectives so that they master the content. Row 3

Proficient 94% 65% 35% 24%
Competent 6% 35% 65% 76%
Novice 0% 0% 0% 29%

Education 602
Summer 2016 Multicultural Classroom Rubric Results
n = 17
Lesson Plans

**EDUC 602 Lesson Plan Summer 16**

<table>
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<th>Category</th>
<th>Mean Score (N=10)</th>
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<td>Instructional Goals and Objectives</td>
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<td>Content</td>
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<td>Modifications for Differentiated Instruction</td>
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<tr>
<td>Engagement/ Transitions</td>
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<tr>
<td>Organization</td>
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</table>
Closing-the-Loop Analysis*

- Program Closing-the-Loop Discussion: Internship rubric (TK20) shows problem with multicultural indicators

3 Interventions

- Created Multicultural Classroom: group assignment (Su2016)
- Created Lesson Plan individual assignment
- Created Adaptation revision reflection

Remeasure

- Remeasured with rubrics**
- Required revisions
- Students demonstrated improved competency after revision

Learning Challenge

*Program-Level measurement for student teaching pending

**aka double-loop analysis
What are the data systems readily available to you?

What kinds of data do they store? (direct, indirect, or both)

What systems are available on campus that you need other experts to help you access?

What kinds of data do they store? (direct, indirect, or both)
# Dashboard Your Indicators

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<td>RedCard Swipe Data (CSJ, etc.)</td>
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Student Success Infrastructure
Think-Pair-Share

Level 5
- Dashboards
- Advising
- Planner
- iPASS

Level 4
- Measurement Tools
- Predictive Analytics
- SSMx – Intervention catalog
- Early Alert

Level 3
- Business Intelligence System – integration of data

Level 2
- LMS
- SaaS Applications

Level 1
- Finance
- HR
- Student
At Your Institution...

Level 5

Level 4

Level 3

Level 2

Level 1
Student Success Infrastructure

Level 5
- Dashboards
- Advising
- Planner
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- SSMx - Intervention catalog
- Early Alert

Level 3
- Business Intelligence System - integration of data

Level 2
- LMS
- SaaS Applications

Level 1
- Finance
- HR
- Student
Scenario 1: Intervention via Tutoring

- **Intervention Strategy:** Institutional Student Success Course/Tutorial- Academic Success for Lifelong Learning Course
- **Data Source(s):** Direct data from multiple semesters and multiple sections of the intervention
- **Problem Description:** You are a learning resources center leader or teacher who wants to explore student learning in multiple sections of a course where faculty use a common rubric and assignment. You set up your rubric in your LMS; all faculty are using it to give feedback and assess learning and grades, and each teacher can access a report to view the aggregated data from the individual course-level assignment. But you can’t figure out how to aggregate the data across courses. What technology tools would make this possible? How could you compare data across semesters and years? (Harrison & Braxton, 2018).
- **Student Success Indicators:**
  - Student Learning Outcomes Evidence (direct measure test data)
  - Student Success data (indirect measures: grade point average, retention, persistence, and academic progression via First Year Intervention alert)
### Rubric Data

<table>
<thead>
<tr>
<th>Organization (FC3)</th>
<th>Clarity (FC1)</th>
<th>Concepts/Principles (FC4+5)</th>
<th>Critical Thinking/Creativity (FC3,4,+5)</th>
<th>Writing skills (FC1)</th>
<th>Terminology (FC3)</th>
<th>APA format (FC4+5)</th>
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<tr>
<td><strong>Proficient 4</strong></td>
<td>50%</td>
<td>39%</td>
<td>40%</td>
<td>36%</td>
<td>36%</td>
<td>37%</td>
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<tr>
<td><strong>Competent 3</strong></td>
<td>40%</td>
<td>41%</td>
<td>46%</td>
<td>36%</td>
<td>31%</td>
<td>48%</td>
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<tr>
<td><strong>Minimal Competence 2</strong></td>
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<td>19%</td>
<td>14%</td>
<td>28%</td>
<td>31%</td>
<td>15%</td>
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<tr>
<td><strong>Not Competent 1</strong></td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>1%</td>
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</table>
Scenario 2:

**Scenario 2: Course Sequencing—Progress Across Program**

- **Intervention Strategy:** Redesign of gateway course
- **Data Source(s):** Direct and indirect data from multiple semesters and multiple sections of the intervention and the next course in the sequence
- **Problem Description:** You are a program or department leader who wants to explore the impact an intervention has had on student learning in a gateway course across time and in the next course in the sequence. You need data on both direct and indirect measures. How can you extract the relevant rubrics and institutional data and triangulate them? (Harrison & Braxton, 2018).
- **Student Success Indicators:**
  - Student Learning Outcomes Evidence (direct measure rubric data)
  - Student Success data (indirect measures: grade point average, retention, persistence, and academic progression in the program)
  - Student Satisfaction Data: student survey (Likert scale plus qualitative reflection questions)
FIGURE 20: FILLING GAPS REVEALED BY CURRICULUM MAPPING THROUGH A SERIES OF ASSIGNMENTS

FACEBOOK POSTS 1 TO 9, FALL 2015 MCS 101

CONNECTING NEW MATERIAL
DISCUSSING QUOTE
SELECTING QUOTE

- **Intervention Strategy:** Institution-wide curriculum mapping and vertical alignment
- **Data Source(s):** Both direct measures of student learning and indirect measures of student success
- **Problem Description:** You are the Provost and you want to know how well students are learning in relation to the institutional learning outcomes across the campus for the current term. For example, how many programs in each college have created direct measures of student learning in your LMS that align to program and institutional outcomes? What data do you need on your Learning Outcomes Dashboard so you can easily determine if students are achieving the institutional-level outcomes? What are the data sources? What tools can help you analyze the data, so you can identify institutional-level learning challenges? (Harrison & Braxton, 2018).

- **Student Success Indicators:**
  - Student Learning Outcomes Evidence (direct measure data)
  - Student Success data (indirect measures: grade point average, retention, persistence, and academic progression in the program)
  - Student Satisfaction Data: NSSE and HERI data
Questions?

- Thanks for joining us today!
- Please share your scenarios
- Contact with questions, ideas, or suggestions
- See our NILOA Occasional Paper!
Session Evaluations & Drawing

- Download and open OLC Conferences mobile app
- Navigate to specific session to evaluate
- Select “Evaluate Session” on session details screen (located under session type and track)
- Complete session evaluation*

*Each session evaluation completed (limited to one per session) = one contest entry

**Five (5) $25 gift cards** will be awarded to five (5) individuals
Must submit evals using the OLC Conferences mobile app or website
References


References


