Opportunities and Challenges of Using Analytics to Improve Higher Education Quality

Fayetteville State University
Dr. Su Dong
Dr. Dana Dalton
Opportunities and Challenges

• What DATA does your institution have?

• Do you use the data effectively?

• Assuming the CIO of Amazon works for you, what would you expect him to do?
Benchmarking/Recommendation
Feedback

Top customer reviews

S Sanders

⭐⭐⭐⭐⭐ Love
October 9, 2018
Color: Space Gray | Size: 256 GB | Verified Purchase
So happy with my purchase!

4 people found this helpful

Helpful | Comment | Report abuse

Georgios Tserotas

⭐⭐⭐⭐⭐ Unlocked. Great product
October 6, 2018
Color: Gold | Size: 355 GB | Verified Purchase

Everything was perfect. Brand new, reliable and fast service. Bought at Spartan Technologies, I'm extremely satisfied

8 people found this helpful

Helpful | Comment | Report abuse
Incentive

Frequently bought together

- Apple iPhone XS Max, Fully Unlocked 6.5", 256 GB - Gold $1,401.00
- TETHYS Glass Screen Protector Designed for iPhone XS Max (6.5") [3-Pack] [Edge to Edge Coverage... $13.99
- Apple MMEF2AM/A AirPods Wireless Bluetooth Headset for iPhones with iOS 10 or Later White $144.98

These items are shipped from and sold by different sellers. Show details
Learning Outcomes

• Sensitize the need for using data analytics to assess and improve academic quality

• Identify ways of using an innovative data tool (Continuous Improvement Report) to drive continuous improvement for academic quality
Assessment Metrics

- Persistence (Transfer/FTF)
- Teaching Evaluation
- Advisement Survey/Starfish Participation
- PSLO
- OPAR
- SCH/FTE
- Community Service
- CLA Senior Results
- Research/Creative Activities
Business Analytics & Drill Down

• Use of Metrics
  • Benchmarking
  • Incentives (Additional Funding Model)
  • Feedback

• Drill Down
  • Retention Dashboard
  • Student Major Change Dashboard
  • SCH/FTE Dashboard
### Continuous Improvement Report

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Year One*</th>
<th>Points</th>
<th>Year Two*</th>
<th>Points (4)</th>
<th>Possible Imp</th>
<th>Actual Imp</th>
<th>Imp Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence (First-Time)</td>
<td>0.71</td>
<td>0.71</td>
<td>0.91</td>
<td>0.91</td>
<td>0.29</td>
<td>0.19</td>
<td>0.68</td>
</tr>
<tr>
<td>Persistence (Transfer)</td>
<td>0.86</td>
<td>0.86</td>
<td>0.63</td>
<td>0.63</td>
<td>0.14</td>
<td>-0.23</td>
<td>-0.23</td>
</tr>
<tr>
<td>Teaching Evaluation</td>
<td>4.49</td>
<td>0.90</td>
<td>4.52</td>
<td>0.90</td>
<td>0.51</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Advisement Survey Results</td>
<td>1.00</td>
<td>1.00</td>
<td>0.94</td>
<td>0.94</td>
<td>0.00</td>
<td>-0.06</td>
<td>-0.06</td>
</tr>
<tr>
<td>PSLO evaluation</td>
<td>3.00</td>
<td>0.60</td>
<td>3.00</td>
<td>0.60</td>
<td>2.00</td>
<td>0.00</td>
<td>2.00</td>
</tr>
<tr>
<td>GPAR evaluation</td>
<td>3.20</td>
<td>0.64</td>
<td>3.35</td>
<td>0.67</td>
<td>1.80</td>
<td>0.18</td>
<td>0.08</td>
</tr>
<tr>
<td>SCH/FTE Ratio</td>
<td>0.97</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research/Creative Activities</td>
<td>0.80</td>
<td>0.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Service</td>
<td>0.60</td>
<td>0.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLA Senior Results</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Total Points

- **Performance Points:** 5.63
- **Improvement Points:** 0.36
- **Total Points:** 6.00

**CIR Funds:** Total Points * Dollar/Point

- **CIR Funds:** $1,395.00

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*“Improvement” compares these two years

**Notes:**
- **Department Size:** 5
- **Normalized Score:** 11.16
- **Maximum Size:** 24

**Performance Improvement Points**

- Performance = Total Points + 4 * Improvement Points
Persistence (Transfer/FTF)
Persistence (Transfer/FTF)
Student Flow Chart

- Student Started as Freshman
- Student Started as Transfer Student
- Come back Next Year
- Dropped from the major
- Graduated
Persistence (Transfer/FTF)
Calculations

Graduated + Come back Next Year
Student Started as Transfer Student

Graduated + Come back Next Year
Student Started as Freshman

Persistence of Transfer Students
Persistence of First Time Freshman
Persistence (Transfer/FTF)

Calculations

• Sample
  • Department of ABC
  • Average Persistence Score:
    • 2013 – 0.87
    • 2014 – 0.88
  • Points for Performance = 0.88
  • Improvement Points = Actual Improvements / Possible improvements
    = \frac{(0.88 - 0.87)}{(1 - 0.88)} = 0.083
Persistence (Transfer/FTF)
The Student Persistence Dashboard

• Identify students graduated/dropped/retained
• Help understand each group
Teaching Evaluation
Teaching Evaluation

Calculations

• Teaching Evaluation question used
  • “Assess the extent in which the course contributed to your learning (set aside your feelings about subject matter, time of the class, course difficulty, and other similar factor)”

• Sample
  • Department of ABC
  • Average Teaching Evaluation Score:
    • 2013 – 4.37
    • 2014 – 4.62
  • Points for Performance = 4.62/5 = 0.924 (Normalized between 0 and 1)
  • Improvement Points = Actual Improvements / Possible improvements
    = (4.62 – 4.37) / (5 – 4.37) = 0.40
Teaching Evaluation
Calculations

• Decline in teaching evaluation
  • Department of ABC
  • Average Teaching Evaluation Score:
    • 2013 – 4.70
    • 2014 – 3.90
  • Points for Performance = 3.90/5 = 0.78 (Normalized between 0 and 1)
  • Negative Improvement Points
    = (4.70/5) – (3.90/5) = –0.16
Advisement Survey/Starfish Participate
Advisement Survey/Starfish Participation Calculations

- Satisfied
  - Scores: 4, 5, 6 are treated as satisfied

- Unsatisfied
  - Scores: 1, 2, 3 are treated as unsatisfied

- Similar system is adopted by Facebook (Like and Dislike)
- This metric measures % of students satisfied
PSLO and OPAR
PSLO (Program Student Learning Outcomes)
OPAR (Operational Performance Assessment Report)
Calculations

- Same calculations as Teaching evaluation

- Sample
  - Department of CDE
  - Average Teaching Evaluation Score:
    - 2013 – 4.37
    - 2014 – 4.62
  - Points for Performance = $4.62/5 = 0.924$ (Normalized between 0 and 1)
  - Improvement Points = Actual Improvements / Possible improvements
    = $(4.62 - 4.37) / (5 - 4.37) = 0.40$
SCH/FTE
SCH/FTE Calculations

Sample Data for Department XYZ

<table>
<thead>
<tr>
<th>Faculty in Department XYZ</th>
<th>SCH</th>
<th>FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. ABC</td>
<td>1.1</td>
<td>1</td>
</tr>
<tr>
<td>Dr. BCD</td>
<td>0.5</td>
<td>0.75 (one course release)</td>
</tr>
<tr>
<td>Dr. CDE</td>
<td>0.6</td>
<td>0.5 (part time)</td>
</tr>
<tr>
<td>Dr. DEF</td>
<td>0.9</td>
<td>0.25 (Associate Dean)</td>
</tr>
<tr>
<td>Total</td>
<td>3.1</td>
<td>2.5</td>
</tr>
</tbody>
</table>

SCH/FTE calculation

- **Performance Point**
  SCH/FTE for department XYZ = 3.1/2.5 = 1.25

- **Improvement Point**
  For department with SCH/FTE >= 1, Imp Point = 1
  For department with SCH/FTE < 1
    If there is an improvement: Imp Point = (Actual Imp)/(Possible Imp)
    If there is a decline: Imp Point = Actual Decline
CLA Senior Results
# CLA Senior Results

## Calculations

### Sample Data for Department XYZ

<table>
<thead>
<tr>
<th>Department</th>
<th>Prof-Adv%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department XYZ</td>
<td>47%</td>
</tr>
<tr>
<td>Department ABC</td>
<td>90%</td>
</tr>
<tr>
<td>Department CFG</td>
<td>60%</td>
</tr>
</tbody>
</table>
CLA Senior Results
Calculations

• Only **PERFORMANCE** points for the CLA Senior Results
Research/Creative Activities & Community Service
Background

• Previous efforts (narrative with documentation) to incorporate Scholarly/Creative Activities and Community Engagement have proven ineffective.

• In view of the importance of these two areas of activity for faculty and departments, it is important to include in the CIR in a meaningful way.
Assessment

• Identify a minimum requirement for each faculty member in each area.

• CIR Score = percentage of faculty who meet the minimum criteria.


• Individual data must be reported in Digital Measures (DM) as basis for report.
Minimum Requirement: Both Areas

• Each full-time faculty member expected to achieve
  • 1 work reflecting highest level of accomplishment (Category 1) OR
  • 3 works reflecting high level of accomplishment (Category 2)

• Specific documentation required for each.

• To ensure report can be completed before the end of the academic year, the reporting period will be May 1 – April 30.
Normalized CIR Score

• Departments vary in terms of their sizes (number of full time faculty)
  • Smallest Department - 5
  • Largest Department - 24

• Normalized CIR Score Example
  • Department Size: 6
  • Total Points: 14.7
  • Normalized CIR Score \[ \text{Normalized CIR Score} = 14.7 \times \left(1 + 0.5 \times \frac{\text{Department Size}}{\text{Maximum Size}} \right) \]
    \[= 14.7 \times \left(1 + 0.5 \times \frac{6}{24} \right) = 16.5375 \]
  • CIR Funds = $75.00 \times 16.5375 = $1,240.31
<table>
<thead>
<tr>
<th>1&lt;sup&gt;st&lt;/sup&gt;-time students who enrolled in fall</th>
<th>N</th>
<th>1-year retention rate (% returned for year 2)</th>
<th>4-year graduation rate (% completed degree in 4 years)</th>
<th>6-year graduation rate (% completed degree in 6 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>931</td>
<td>69.3%</td>
<td>12%</td>
<td>32.1%</td>
</tr>
<tr>
<td>2008</td>
<td>579</td>
<td>73.6%</td>
<td>17.1%</td>
<td>34.5%</td>
</tr>
<tr>
<td>2009</td>
<td>754</td>
<td>69.1%</td>
<td>16%</td>
<td>35.1%</td>
</tr>
<tr>
<td>2010</td>
<td>538</td>
<td>72.3%</td>
<td>16.5%</td>
<td>NA</td>
</tr>
<tr>
<td>2011</td>
<td>647</td>
<td>75.6%</td>
<td>17.2%</td>
<td>NA</td>
</tr>
<tr>
<td>2012</td>
<td>600</td>
<td>71.3%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>2013</td>
<td>707</td>
<td>74.5%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>2014</td>
<td>476</td>
<td>78%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Peer Average</strong></td>
<td></td>
<td><strong>70.5%</strong></td>
<td><strong>20%</strong></td>
<td><strong>41.6%</strong></td>
</tr>
</tbody>
</table>
Information Technology Portfolio
Feedback
Minimum Requirement

• General guidelines for calculating points are provided, but departments will have decide on what to count under each category.

• **Important note:** meeting minimum requirement for CIR is NOT equivalent with meeting minimum requirements for tenure, promotion, or post-tenure review (though failure to meet the minimum could serve as “red flag” for unsatisfactory progress toward these personnel actions.)
Minimum Requirement for Scholarly/Creative Activities:
1 work from Category 1 Or 3 works from Category 2

<table>
<thead>
<tr>
<th>Category 1: A work that demonstrates highest level of professional accomplishment, expertise, and recognition.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Article, creative work, book chapter, or book that has been reviewed by peers and has national or international scope.</td>
</tr>
<tr>
<td>b. Scholarly presentation for regional, national, or international conference or meeting.</td>
</tr>
<tr>
<td>c. Exhibit or performance in national or international venue.</td>
</tr>
<tr>
<td>d. Competitive grant proposal or competitive renewal grant funded during the period.</td>
</tr>
</tbody>
</table>

* Required fields specified in template.
**Minimum Requirement for Scholarly/Creative Activities:** 1 work from Category 1 Or 3 works from Category 2

**Category 2:** A work that demonstrates a high level of professional accomplishment, expertise, and recognition.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Scholarly presentation for state or local conference and meeting</td>
<td>Documentation: DM “Presentation” Report*</td>
</tr>
<tr>
<td>c. Exhibit or performance at state or local venue.</td>
<td>Documentation: DM “Artistic, Performance, and Exhibit” Report*</td>
</tr>
<tr>
<td>d. Non-Competitive grant proposal or competitive renewal grant funded during the period.</td>
<td>Documentation: Report from RAMASeS.</td>
</tr>
</tbody>
</table>

* Required fields specified in template.
Minimum Requirement for Community Engagement: 1 work from Category 1 Or 3 works from Category 2

<table>
<thead>
<tr>
<th>Category 1: Professional expertise used for activity that requires 10 or more hours.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Public Service activity, committee member, board member (requires 10 or more hours)</td>
</tr>
<tr>
<td>b. Public school support activity (requires 10 or more hours)</td>
</tr>
<tr>
<td>c. Continuing Education course taught (requires 10 or more hours)</td>
</tr>
<tr>
<td>d. Service Learning course</td>
</tr>
</tbody>
</table>

*Required fields specified in template.
**Minimum Requirement for Community Engagement:**
1 work from Category 1 Or 3 works from Category 2

<table>
<thead>
<tr>
<th>Category 2: Professional expertise used for activity that requires fewer than 10 hours.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a.</strong> Public Service activity, committee member, board member (requires fewer than 10 hours)</td>
</tr>
<tr>
<td><strong>Documentation:</strong> Digital Measures: “Public Service” report*</td>
</tr>
<tr>
<td><strong>b.</strong> Public school support activity (requires fewer than 10 hours)</td>
</tr>
<tr>
<td><strong>Documentation:</strong> DM “Public School Service” report*</td>
</tr>
<tr>
<td><strong>c.</strong> Continuing Education course taught (requires fewer than 10 hours)</td>
</tr>
<tr>
<td><strong>Documentation:</strong> DM “Non-credit instruction” report.*</td>
</tr>
<tr>
<td><strong>d.</strong> Resource for media, newspaper article or Op-Ed article.</td>
</tr>
<tr>
<td><strong>Documentation:</strong> DM: Media Contributions Report*</td>
</tr>
</tbody>
</table>

*required fields specified in template