Analyzing “Toxic” Course Combinations to Improve Academic Advising & Student Success

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Agenda

- Addressing the Need
  - Description of Issue
  - Complicating Factors
  - Proposed Solution

- Methodology
  - Overview
  - Initial Findings
  - Anticipated Use
  - Current Limitations

- Looking Ahead
  - Next Steps
  - Future Research Opportunities

- Wrap-up & Contact Information
ADDRESSING THE NEED
Managing undergraduate DFW* rates is (or should be) a priority

**FIRST AND FOREMOST:** we want our students to **succeed!**

Meet accreditation requirements

Core student outcomes directly impact educational funding received from the state under the performance-based funding (PBF) model

*DFW = A student earning a “D”, “F”, or “W” as their final grade in a course*
Student success directly impacts all institutions in multiple ways

Impacts reputation & ranking, which directly influence:

- Quality of entering students
- Admissions figures
- Employee quality & retention (faculty & staff)
- Research
- Funding

Impacts a range of PBF outcome metrics, which are an absolutely critical priority for state-funded schools:

- Six Year Graduation Rate;
- Academic Progress Rate;
- Bachelor’s Degrees Awarded in Areas of Strategic Emphasis;
- % of Bachelor’s Degrees w/o Excess Hours; and
- Indirect impact on others (e.g. placement-related outcomes)
Identifying not only standalone high DFW courses, but combinations of courses, may provide some benefit

More impactful, data-based student advising

Update plans of study with more optimal course sequencing based on data

More effectively direct resource support (e.g. peer tutoring or SI funding)

Identify course(s) that may be ripe for review & revision

YOU CAN'T IMPROVE WHAT YOU DON'T MEASURE, YOU CAN'T MEASURE WHAT YOU DON'T TRACK.

~SOME NERD WHO LOVES CONTINUOUS IMPROVEMENT
So how can institutions leverage data on DFW rates to improve student success?

Come on down and let’s take a look at one potential method the UCF IKM team has developed!
METHODOLOGY
Methodology Overview

Compares aggregate student performance in the course in which a DFW was earned (Base Course) against other (relatively) historically high DFW rate courses (Combo Course)

Structured to allow differences between specific combinations to be picked up by holding the DFW in the Base Course constant

The greater the difference between the DFW rate of the Course Combination vs. the historical Base Course DFW rate, the more “toxic” a course combination is
Underlying dataset to gather & validate required data took some work to assemble

Dataset includes the following filters:
1. Data from 2012-13 to 2016-17 AYs
2. At least 10 DFW earned in last 5 years
3. At least 10 students in a course cohort (over prior 5 years)
4. Course is credit-bearing (CBI > 0)

Note: "Transfer" STU_TYPE includes any student whose recent type was not "FTIC"
The tool has undergone several iterations since initial development

<table>
<thead>
<tr>
<th>Initial draft w/rigorous criteria &amp; static DFW rate</th>
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<tbody>
<tr>
<td>Course data from prior five (5) academic years</td>
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<tr>
<td>Identify the “vital few” from the “trivial many”</td>
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<table>
<thead>
<tr>
<th>Updated draft w/loosened criteria &amp; static DFW rate</th>
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<tbody>
<tr>
<td>Course data from prior five (5) academic years</td>
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<td>Expanded criteria to allow use across a broader range of colleges</td>
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<th>Latest draft w/loosened criteria &amp; dynamic DFW rate</th>
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<tr>
<td>Course data from prior five (5) academic years</td>
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<td>Provide greater accuracy &amp; insight</td>
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Development was iterative before aligning on the final process

**Iterative Cycle**

1. **Align on data assumptions**
2. **Identify dataset and create/update project in SAS EG to pull required data**
3. **Analyze & prepare summary of data**
4. **Review output w/stakeholders for utility & continuous improvement**

**(Latest) Deliverable**

Dynamic Excel-based reporting tool based on SAS dataset
Initial findings were promising and may contain information of value

There were *indeed* specific course combinations that appeared to negatively impact student academic success (i.e. performance in the Base Course)

Higher-than-historical DFW rates in certain course combinations appear to be mainly due to rigor/difficulty with a course in the combination (e.g. STEM courses)
- More investigation is needed to confirm!

Initial results shared with UGRD Studies, who have shared it preliminarily with a limited audience of administrators to begin understanding tool & developing a utilization plan
The data is anticipated to be used in multiple ways

**Academic program improvement**
- Course sequencing
- Course review

**Advising & student support**
- Guidance rooted in data
- Better resource utilization

**Registration**
- “Pegasus Pathway” alerts
- Targeted support
There are some limitations with the current methodology

- Beholden to the almighty $n$
- Does not factor out other course(s) students may have taken in the same term as the Base Course, which may also contribute to performance
- Does not take personal factors into account (strictly course data-based)
- Had to adjust constraints in order to include a broad array of courses across all colleges & student majors, which impacted courses considered as having a “high” historical Base Course DFW rate
LOOKING AHEAD
There are several next steps currently being planned:

- Incorporating GPA breakout
- Structured & ethical:
  - Data utilization plan
  - Communication plan
- Expanding timeframe to include a broader range of courses
- Improved summary reporting
- Renaming the combos
Future research opportunities exist for us to improve

Stat-based analyses to confirm preliminary results/findings

- Group testing (difference) vs. regression (predictive)
- “Validating the potentially valid”

Incorporating a greater number of course combinations in the analysis

- Start with three (3); Greater numbers require far more complicated logic & structured testing

Expand analysis?

- Additional, non-academic factors to include?
- Controlled testing?
WRAP-UP & CONTACT INFORMATION
Q&A

Questions / Thoughts / Suggestions / Feedback
Thank you very much for your time & participation in today’s session!
Contact information

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