Predictive Analytics Reporting (PAR) Framework

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The Predictive Analytics Reporting (PAR) Framework

• A “big data” analysis effort identify drivers related to loss and momentum and to inform student loss prevention

• WCET member institutions voluntarily contribute de-identified student records to create a single federated database which is then analysed using descriptive, inferential and predictive methods.
PAR Objectives

• Identify **common variables** likely to influence student retention and progression, and measure the degree of influence

• Determine if measures and definitions of retention, progression, and completion **differ materially** among various types of postsecondary institutions

• Begin to identify the highest impact interventions with targeted pools of at risk-students
Costs and Completion Rates

Soaring College Tuitions
College tuition continues to outpace median family income and the cost of medical care, food and housing.

Growth since 1982-84

Graduation rates at 150% of time

Source: New York Times; NCES
Performance Based Funding

Performance Funding for Higher Education

February 2013

Typically, colleges receive state funding based on how many full-time equivalent students are enrolled at the beginning of the semester. That model provides incentives for colleges to enroll students—but not necessarily to help them graduate. Many states are reconsidering the enrollment-based funding model and instead are allocating money to colleges based on the number of students who complete courses and degrees.

Are You “Data-Ready”?

http://www.whitehouse.gov/issues/education/higher-education/college-score-card
PAR Framework background

- Managed by WICHE Cooperative for Educational Technologies, operated by WCET core project team
- **16** grant-funded institutional partners
  - 7 4-year schools
  - 5 community colleges
  - 4 for-profit institutions
- New self-funding members
- Grant extensions for new work

**In-kind donations to date**
- Blackboard
- iData
- Starfish
1. Identify potential for multi-institutional data mining

2. Expand sample, variables and measurement period

3. Deliver models, frameworks, benchmarks and alerts to individual campuses

4. Perform field tests to analyze interventions across institutions

5. Scale and self-sufficiency
Institutional Partners

**Founding Partners (since 2011):**
- American Public University System*
- Colorado Community College System*
- Rio Salado College*
- University of Hawaii System*
- University of Illinois Springfield*
- University of Phoenix*

**Implementation Partners (since 2012):**
- Ashford University
- Broward College
- Capella University
- Lone Star College System
- Penn State World Campus
- Sinclair Community College
- Troy University
- University of Central Florida
- University of Maryland
- University College
- Western Governors University

**New Members (as of Oct 2013):**
- Northern Arizona University
- Kaplan University
- Excelsior College
- University of North Dakota
DATA STATISTICS

• Total Counts Time Frame
  • August 2009 – May 2013

– 13,090,351 course records
– 1,842,917 student records
The PAR Framework Value Proposition

Scalable cross-institutional improvements
Structured, Readily Available Data

• Common data definitions = reusable predictive models and meaningful comparisons.
• Openly published via a cc license @ https://public.datacookbook.com/public/institutions/par
PAR Data Inputs

**Student Demographics & Descriptive**
- Gender
- Race
- Prior Credits
- Perm Res Zip Code
- HS Information
- Transfer GPA
- Student Type

**Student Course Information**
- Course Location
- Subject
- Course Number
- Section
- Start/End Dates
- Initial/Final Grade
- Delivery Mode
- Instructor Status
- Course Credit

**Student Financial Information**
- FAFSA on File – Date
- Pell Received/Awarded – Date

**Student Academic Progress**
- Current Major/CIP
- Earned Credential/CIP

**Course Catalog**
- Subject
- Course Number
- Subject Long
- Course Title
- Course Description
- Credit Range

**Lookup Tables**
- Credential Types Offered
- Course Enrollment Periods
- Student Types
- Instructor Status
- Delivery Modes
- Grade Codes
- Institution Characteristics

**Possible Additional**
- Placement Tests
- NSC Information
- SES Information
- Satisfaction Surveys
- College Readiness Surveys
- Intervention Measures

**Future**
Some of PAR’s “Outputs”

- Reflective Institutional Reports
- Cross-Institutional Benchmarks
- Aggregate Models
- Institutional Models
- Student Watch List
- Policy
- Local Intervention
- Comparative Interventions
Actionable Predictive Models

Number of Students: 6,223

PASS_CLASS
- (All)
- No
- Yes

Pass MATH 0306

Pass?
- No
- Yes

Pass Class?

Data: Fail, Pass

Number of Students

GPA

N.DEVED.CREDITS_ATTEMPT

N.WITHDRAWALS.6

CIP

CIP_TITLE
- Liberal Arts and Sciences/Lib.
- Business/Commerce, General
- Criminal Justice/Law Enforce.
- Accounting
- Early Childhood Education and

Model Performance

Data: Fail, Pass

Model: Fail, Pass, Grand Total

Grand Total: 971, 1,020, 2,000

AGE

PRIOR_0306_ATTEMPT

STUDENT_TYPE

HOME_LOCATION_ID

RACE_CODE

Risk Threshold: 0, 0.945
Sample benchmark framework
Once we know what we are talking about it's easier to deal with the “Now, What?” problem.
PAR Student Success Matrix (SSMx)

**Literature-based tool for benchmarking student services**

- 600+ total interventions submitted
- Ability to compare among all 16 PAR institutions
- Basis for institutional intervention field tests
- Publically available, over 1,000 downloads since June 2013

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<thead>
<tr>
<th>PREDICTORS</th>
<th>CONNECTION</th>
<th>ENTRY</th>
<th>PROGRESS</th>
<th>COMPLETION</th>
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<td>completion of gatekeeper</td>
<td>entry into program to 75% of</td>
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<td>instructor characteristics/behaviors</td>
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Testing Intervention Effectiveness

• **4 Year Institutions:**
  – Does Peer Mentoring (social integration focus) improve success as measured by % of students earning a C or better?

• **Community Colleges:**
  – Do the same or similar developmental education approaches offered at multiple institutions yield the same or similar results at all each institution?
• Without common diagnoses, it is difficult to agree on treatments to address diagnosed problems.
• Without agreed-upon treatments, it is difficult to measure the efficacy of treatments.
• If one cannon measure efficacy it is impossible to scale.
• Perhaps worse of all, we continue to guess about what really works in student success.
Helping Students Succeed.

Scaling Student Success

Delivering on the Promise of Data
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