Predicting Academic Risk for Intervention

IU Kokomo

University Planning, Institutional Research, and Accountability

May 13, 2008
A Blast from the Past: UPIRA Retention Tour ‘07

- Study: ‘Retention among first-time full-time students’
- Fall to fall retention as a set of sequential decisions
  - Retention between fall and spring
  - Retention between spring and second year
  - Reasons for retention/departure differ by semester
- Sample ~ 5,300 from 2004 and 2005 cohorts
- First-time full-time students at IU Regionals or IUPUC
Important Finding:
Second Semester Retention Rate by GPA
The Good, the Bad, and the Ugly

The Good (News)

GPA is among the BEST predictors of retention

The Bad (News)

End-of-semester measures may be too late

The Ugly (Solution)

Predicting academic risk at the time of admission

What we’ll attempt here, but then what…?!
Sample: Adelman Cohorts

♦ Students New to IU Kokomo
  • Beginners/Transfers
  • Six or more credit hours
  • Fall or Spring Semester
  • 2005-06 & 2006-07 Academic Yrs.
  • Sample size = 1,468 students
Who are these students?

Beginner/Transfer = 66/34

Full-time/Part-time = 73/27

Avg. Age = 23

Male/Female = 35/65

White/Other race = 90/10

Howard Co./Other = 38/62

Core-40/Regular = 55/45

Regular app./Late app. = 74/26

Avg. SAT = 958 (36% not reporting)

Need/No need = 37/63
End-of-Semester Status

♦ Four Groups:

- GPA 3.0+
- GPA 2.0 – 2.9
- GPA < 2.0
- No Credit Earned
% of New Students Within Each Group

- GPA 3.0+: 33%
- GPA 2.0-2.9: 35%
- GPA < 2.0: 20%
- No Credit Earned: 12%
% of Students Within ‘No Credit Earned’

- No Hours Earned: 65
- No Record (End-of-Semester): 27
- No Record (End-of-Refund): 8
Subsequent Semester Retention Rate

- GPA 3.0+: 89
- GPA 2.0-2.9: 86
- GPA < 2.0: 66
- No Credit Earned: 23
% of Non-Returners Within Each Group

- GPA 3.0+: 15
- GPA 2.0-2.9: 20
- GPA < 2.0: 28
- No Credit Earned: 37
Between-Group Comparison: New Students and Non-Returners

<table>
<thead>
<tr>
<th>GPA Range</th>
<th>% of New Students</th>
<th>% of Non-Returners</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA 3.0+</td>
<td>33</td>
<td>15</td>
</tr>
<tr>
<td>GPA 2.0-2.9</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>GPA &lt; 2.0</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td>No Credit Earned</td>
<td>12</td>
<td>37</td>
</tr>
</tbody>
</table>
Predictors of End-of-Semester Status

- Cohort (Beginner, Transfer)
- Credit Load (Full-time, Part-time)
- Gender (Female, Male)
- Race (White, Nonwhite)
- Age (< 20, 20 – 24, 25+)
- Geographic Origin (Home Co., Other Co.)
Predictors of End-of-Semester Status

♦ Diploma Type (Core-40/Honors, Regular)

♦ Application Date:
  • Early (Fall: Before Mar., Spr: Before Sep.)
  • Mid (Fall: Mar. – May, Spr: Sep. – Nov.)
  • Late (Fall: Jun. – Aug., Spr.: Dec. – Jan.)

♦ SAT (< 850, 850 – 990, 1000+, Not Provided)

♦ % Need Met by Gift (No need, <25, 25-50, <50)
Method and Interpretation

♦ Method: Multinomial logistic regression
  • Appropriate for outcomes with multiple categories
  • Results reported as predicted probabilities

♦ Interpretation: A Hypothetical
  • Two students who are similar in every way but one
  • Ex. – “All else being equal, females have a greater probability than males of earning a 3.0+ GPA.”
Results: End-of-Semester Status by Cohort

* Statistically significantly different than “Beginner”
Results: End-of-Semester Status by FT/PT

* Statistically significantly different than “Fulltime”
Results: End-of-Semester Status by Gender

* Statistically significantly different than “Female”
Results: End-of-Semester Status by Ethnicity

<table>
<thead>
<tr>
<th>GPA Range</th>
<th>White</th>
<th>Other Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA 3.0+</td>
<td>32</td>
<td>26</td>
</tr>
<tr>
<td>GPA 2.0-2.9</td>
<td>39</td>
<td>29*</td>
</tr>
<tr>
<td>GPA &lt; 2.0</td>
<td>18</td>
<td>26*</td>
</tr>
<tr>
<td>No Credit Earned</td>
<td>11</td>
<td>18*</td>
</tr>
</tbody>
</table>

* Statistically significantly different than “White”
Results: End-of-Semester Status by Age

- GPA 3.0+:
  - Less than 20: 27
  - 20 to 24: 27
  - 25+: 49*

- GPA 2.0-2.9:
  - Less than 20: 37
  - 20 to 24: 41
  - 25+: 34

- GPA < 2.0:
  - Less than 20: 23
  - 20 to 24: 21
  - 25+: 9*

- No Credit Earned:
  - Less than 20: 13
  - 20 to 24: 12
  - 25+: 8

* Statistically significantly different than “Less than 20”
Results: End-of-Semester Status by App. Date

* Statistically significantly different than “Early”
Results: End-of-Semester Status by SAT Score

- Statistically significantly different than “SAT > 1000”

SAT < 850  SAT 850 - 1000  SAT > 1000  SAT not provided

GPA 3.0+  GPA 2.0-2.9  GPA < 2.0  No Credit Earned

* Statistically significantly different than “SAT > 1000”
Results: End-of-Semester Status by % Need Met

* Statistically significantly different than “> 50% met”
Results: Non-Significant Predictors

- Geographic Origin (Home Co., Other Co.)
- Diploma Type (Core-40/Honors, Regular)
Simulation: Low Risk Scenario

- White
- Female
- Age 25+
- Early applicant
- SAT 1000+
- > 50% need met
Simulation: High Risk Scenario

- Nonwhite
- Male
- Age < 20
- Late applicant
- SAT < 850
- < 25% need met
What Next? Using the Data…

Option 1: Be with the one you love

- “Score” new applicants based on model
- Identify high risk applicants
- Create alternative admissions/enrollment options
- Reshape entering classes of students via recruitment/aid
What Next? Using the Data…

Option 2: Love the one you’re with

♦ “Score” new enrollees based on model
♦ Identify high risk enrollees
♦ Redirect for early academic success
  • Course placement (DFW rates)
  • Target academic support and other interventions
What Next? Using the Data…

Option 2 (continued)

♦ Create more feedback loops
  • Course level: assessment strategies
  • Campus level: track intervention participation