Assessing Achieving the Dream (AtD) Intervention Strategies

Patrick Henry Community College
Role of Achieving the Dream on College Campuses

• Achieving the Dream (AtD) is *not* about simply adopting a particular set of strategies to improve student success.

• Rather, the initiative is designed to help colleges use data to understand the areas where students are experiencing problems and *allocate scarce resources appropriately*.

• In essence we are playing a game of “RISK” when we make student-centered decisions.
Problems with Educational Research

- A single factor alone does not prevent the student from being successful. Educators must realize that lack of student success is a multidimensional problem.

- Why isn’t educational research taken seriously and with the same care as medical studies?
How does Achieving the Dream Methodology Address Both These Problems?

• There is a simple relationship between probabilities and odds. If $p$ is the probability of an event and $O$ is the odds of the event, then

$$O = \frac{p}{1 - p}$$

• Example: If the odds that the Steelers win the Super Bowl is 3:1 then the probability that they will win is 0.75.
Using Odds to Predict Student Failure

• Set odds of failure equal to a set of predictor variables

\[
\frac{p_{it}}{1-p_{it}} = \alpha_t + \beta_1 x_{i1} + \beta_2 x_{i2} + \ldots + \beta_k x_{ik}
\]

• Subscripts reference student \(i\) and semester \(t\).
• Here \(x_k\) reference a different *known* predictor variable:
  – Race
  – Gender
  – Age
• Computer estimates \(\alpha_t\) and \(\beta_j\)
What Do Model Estimates Provide?

• Computer estimates for $\beta_j$ provide insight into that corresponding variable’s contribution to the odds of failure.
Obtaining Risk Scores for Entering First Time Students (Fall 2005)

• Can we use old data to predict the future? That is, does history tend to repeat itself?

• First time degree seeking students in fall 2005 were assigned a risk score (solving for $p_{il}$) in the preceding equation.

• Random assignment of 150 first time degree seeking students to (1) case management or (2) mentoring intervention strategies. Higher risk students were given greater chance of selection. The remaining students will serve as a control.
  – Random assignment allows us to isolate the effect of the strategy and make a definite decision about it’s effectiveness.
Documenting The Process

• AtD Case Management process
  – s:\shared\LUMINA\Case Management Project.mdb
Assessing Fall-Spring Retention Rates—Did the Programs Work in the Short Term?

Predicted Retention Across Risk Score and Intervention Strategies (Eligible Students)
What Can We Conclude?

• Data did not include transfers.

• Time of strategy implementation.

• Intervention strategies may not work in the short-term but what about long-term (e.g. one year retention rates)?
Illustrating the Multidimensional Aspect of Student Success

- Using old information (AtD data from 2002 and 2003) the model was 81% accurate at predicting retention in low-risk students (using a cut-score of 0.3) and 42% accurate at predicting drop-out in high risk students. The overall accuracy of the model that takes the effects of numerous variables simultaneously was 65.4%.

- If we isolated the following variables as being high-risk we would have been correct the following (drop out rates)....
  - Minority students (35.9%)
  - Male students (28.4%)
  - Developmental students (29.6%)
  - Students older than 21 years old (30.2%)
  - Students on financial aid (25.6%)
Applying AtD Methodology to Program Placed Students in Nursing

• Looked at students entering nursing program after transitioning from career studies.
  – 231 nursing students on official AKT report between fall 2001 and spring 2005.
  – Analysis looked at those that became a nursing student after fall 2001 AND transitioned from career studies into the program (95 total students that met both criteria).

• Students who were classified as not successful were as follows:
  – Terminating the program prior to graduation.
  – Still persisting in the program but not complete within 150% of time allowed for graduation (e.g. after 6 non-summer academic semesters).
Graphical Representation of Time to Event Data in Nursing Analysis

- Student 6
- Student 5
- Student 4
- Student 3
- Student 2
- Student 1

Academic Semester:
- $\Delta$ = enter nursing
- $\times$ = censored obs
- $\bigcirc$ = terminate

- Fall 2001
- Spring 2002
- Fall 2002
- Spring 2002
- Fall 2003
Factors Contributing to Lack of Success in Nursing Program

- Poor grade received in 100-level clinical courses (generally taking the 100-level clinicals was a more important factor than the 200-level clinicals).
- Students who started the program earlier in the analysis (e.g. 2001 versus 2005).
- Students who did not have any dependents (interesting?).
- Students who never took a summer course at PHCC.
- Students who transferred courses from another school.
- Poor vocabulary HESI test scores on first attempt.
- Good grammar HESI test scores on first attempt (interesting?)
- Students coming from more financially unstable circumstances.
- Poor information processing LASSI test scores.
- Students who placed poorly on the math placement exam (e.g. ASSET or COMPASS).
Other Factors Considered

- Participation and performance in 200-level clinicals
- Marital status
- First generation designation
- Race
- Gender
- Distance learning courses taken
- Cumulative GPA
- Initial math and reading score on the HESI test
- Number of attempts to pass HESI test
- Age
- Semester credits taken
- Score on reading placement exam (e.g. ASSET or COMPASS)
Recommendations

• What else can we measure and use (e.g. employment status)? How can we get this information?

• Make sure all entering students take the LASSI test to get the information processing score.

• Use old information to predict the future.
  – Assign success probability scores to first time students which takes into account numerous factors together. Those factors that are not significant still contribute something toward failure.
  – Update predictors and add new ones to improve prediction.
  – Use to effectively advise all students and especially high risk students.