ABSTRACT

Existing institutional and departmental data for all 163 students enrolled in Intermediate Algebra (SIU’s remedial mathematics class) in the Spring of 2013 were analyzed, including the following: ACT math sub score, a non-proctored SIU mathematics placement exam score, a proctored SIU mathematics placement (MP) exam score, the quiz/homework grade at the 3-week mark (HQ), and the grade from the first classroom test (T1), also given in week 3. These scores were used to create a weighted metric that would be able to identify which students would successfully pass Intermediate Algebra. Two factors—the ACT mathematics sub score and the non-proctored SIU mathematics placement exam score—were determined to offer insignificant added predictive value and, as a result, were excluded from the metric. The results of the students’ individual weighted metrics in the third week of class correctly identify 74.4 percent of students who did not successfully complete the course in Spring 2013.

METHODS

Participants: 163 SIUC college students enrolled in Intermediate Algebra in the Spring of 2013

Procedures: Students’ existing Intermediate Algebra data was examined.

Success criteria:
- ACT Mathematics sub-score
- The mathematics portion of the ACT’s score
- Non-proctored mathematics placement exam score
- A non-proctored mathematics-placement exam administered before the semester begins in order to place students in the appropriate level of mathematics at SIU
- Proctored mathematics placement exam score
- A proctored mathematics-placement exam administered before the semester begins in order to place students in the appropriate level of mathematics at SIU
- First test score: The first Intermediate Algebra test was administered during the third-week of classes

RESULTS:

Two factors—the ACT mathematics sub score and the non-proctored SIU mathematics placement exam score—were determined to offer insignificant added predictive value and, as a result, were excluded from the metric. The resulting weighted metric M1 was the following:

\[ M_1 = 0.25 \times MP + 0.25 \times HQ + 0.25 \times T1 ]

Since certain students missed the proctored math placement exam, an alternative metric M2 was designed that ignored MP and weighted T1 more highly.

\[ M_2 = 0.25 \times HQ + 0.75 \times T1 ]

The metric M for each of the students was the greater of M1 and M2.

In Spring 2013, the researchers found that of the 86 of the 163 students enrolled in Intermediate Algebra were identified by M as being at risk. Of these at-risk students, 64 did not successfully complete the course with a C or better (the threshold required for entrance into the credit-bearing College Algebra course). Thus, the metric correctly identified 74.4% of those students who did not successfully complete the course in Spring 2013.

DISCUSSION AND IMPLICATIONS:

The results of this study indicate that it is possible to use an easily calculated metric to predict student success in a remedial mathematics course as early as during the first 3 weeks of class. This early identification provides students with the opportunity to change their behaviors in the course or to drop the course without receiving a failing grade. In addition, allocation of resources can be optimized with targeted support systems and ILPs.

REFERENCES:


HYPOTHESIS

We expected that the students that are identified as high-risk students (Red/Orange) at the end of the 3 week of their Intermediate Algebra class would be less likely than students identified as not at risk (Green) to pass the class with a C or better.