EXPERIMENTAL STUDY: PREDICTION OF FINAL EXAM SCORES

LOUISIANA STATE UNIVERSITY — Baton Rouge, LA

Product Name MasteringChemistry

Course Name Introductory Chemistry, Fall 2007

Key Results Research has shown that the Mastering system data can predict students' final exam scores with a correlation of over 0.6.[1] This predictive ability provides instructors with the opportunity to provide personalized instruction for students at risk of failing the course.

Study Design

The students were assigned weekly MasteringChemistry homework and were given a paper-based final examination at the end of the semester. MasteringChemistry data for 204 students was applied to develop a two-parameter item response model for answers scored dichotomously based on whether or not a student obtained the correct answer to a given part of an item on the first attempt without requesting help from the program.

Results and Data

The application of the item response model predicts the paper-based final exam score with a correlation of about 0.68. The correlation implies that about 46% of the variance in the final exam scores is explained by the regression line. The statistical uncertainty in the correlation is between 0.57 and 0.74 with high confidence.

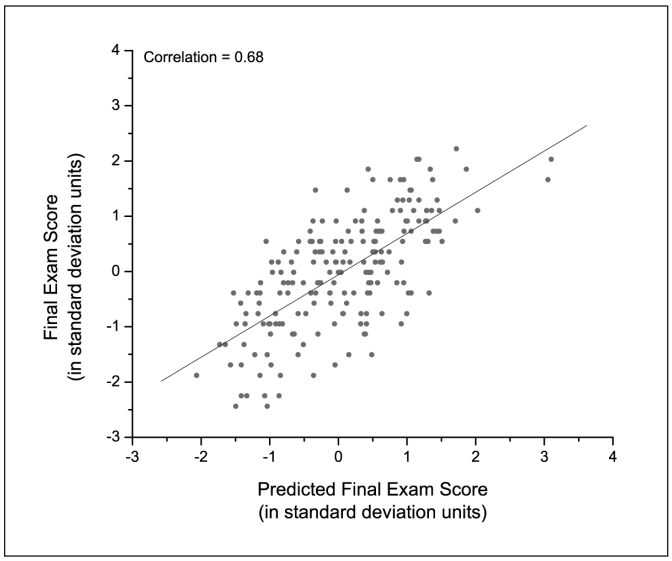

Figure 1. Correlation between the predicted versus the actual final exam score for 204 students at Louisiana State University in fall 2007 using MasteringChemistry.

Conclusion

The predictive ability of the Mastering platforms aids instructors in confidently assessing students at risk of failing the course and provides the necessary remediation. "[Given the fact that a student is being assessed] over the course of the semester over several hundreds of problems with many variables that directly correlate with [the student's] skill, it gives [a] better way to deal fairly with a student's actual skill. This eliminates the high-stakes nature of a final exam. Given such assessment capabilities, teachers could confidently determine a student's skill without worrying about the one who miraculously passed, deserved to pass, or failed, just because of some 'bad luck.'"[1]

[1] *D. E. Pritchard and R. Warnakulasooriya, Data from a Web-based homework tutor can predict student's final exam score, ED MEDIA 2005: World Conference on Educational Multimedia, Hypermedia & Telecommunications, pp. 2523–2529.*

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