Quantitative Reasoning

Definition of the Competency

Students will understand: significance, confidence interval, hypothesis testing, confirmation bias, conflict of interest, simple probability, simple permutations, number sense, money problems, scientific notation, decimal place, order of operations, outliers, random and non-random sampling, algebra, and practical mathematics.

Standards of the Competency

Students will:

- Distinguish and explain proper use of these terms and concepts.
- Solve practical mathematics problems as well as equations with many variables for one of the variables.
- Interpret the results of calculations.

Methodology

A panel of 10 faculty members designed a multiple-choice quantitative reasoning assessment to evaluate the standards above. The assessment was piloted during spring 2003 and 2004 final exams in a 200-level Psychology course and 100-level Biology and Mathematics courses along with the scientific reasoning assessment. The Director of Assessment and Evaluation scored the assessments and summarized the assessment results. We expected to see at least 60% of the students answering each item correctly.

Summary

The assessment results indicate that an average of 87% of students across courses correctly answered 70% of the items, demonstrating competency in the proper use of terms and concepts and in the solving of practical mathematic problems. The least number of correct responses concerned items on decimal placement and significance. However, 68% of students in 100-level mathematics showed competency in decimal placement, while 62% of students in 100-level biology demonstrated competency in significance.

Because this instrument was given to students in our general education curriculum, it is an indicator of competency demonstrated by CNU students regardless of major field of study. Most students taking 100- and 200-level courses at CNU have not yet been exposed to statistics or research coursework.

CNU will implement a new general education curriculum in Fall 2006. This assessment will be forwarded to the Liberal Learning Council for use in designing the curricula for Mathematical Literacy and the Formal and Informal Reasoning area of inquiry.