

**Competency:** To use numerical data and statistics

**Description:** Northwestern has a broadly based core curriculum that is central to the University's mission and consistent with the Louisiana Board of Regents requirements for general education. Students are required to complete at least six (6) credit hours of mathematics selected from MATH1020 – College Algebra – 3 credit hours, MATH1035 – Contemporary Mathematics = 3 credit hours, MATH1060 – Finite Mathematics – 3 credit hours, MATH1090 – Trigonometry – 3 credit hours, MATH2010 – Survey of Calculus – 3 credit hours, MATH1100 – Precalculus – 6 credit hours, MATH1810 – Technical Mathematics – 6 credit hours, MATH2100 – Calculus I – 5 credit hours, MATH2110 – Calculus II – 5 credit hours. Students must complete one of these one or two-course sequences: 1020-1060, 1020-1090, 1020-2010, 1035-1060, 1100, 1810, and 2100-2110. We will measure mastery of this competency by assessing mathematics students.

**Student Learning Outcome:** Students completing MATH1020 and 1060 will be able to use numerical data and statistics to solve problems.

**Measure** (including methodology and target).

Students in MATH1020 and MATH1060 take a common, departmental final exam. This exam is given simultaneously to all students in each course. For each semester, the faculty chose questions from the Final Exams that require the use of numerical data and statistics. Data was collected on the number of students who correctly answered these questions.

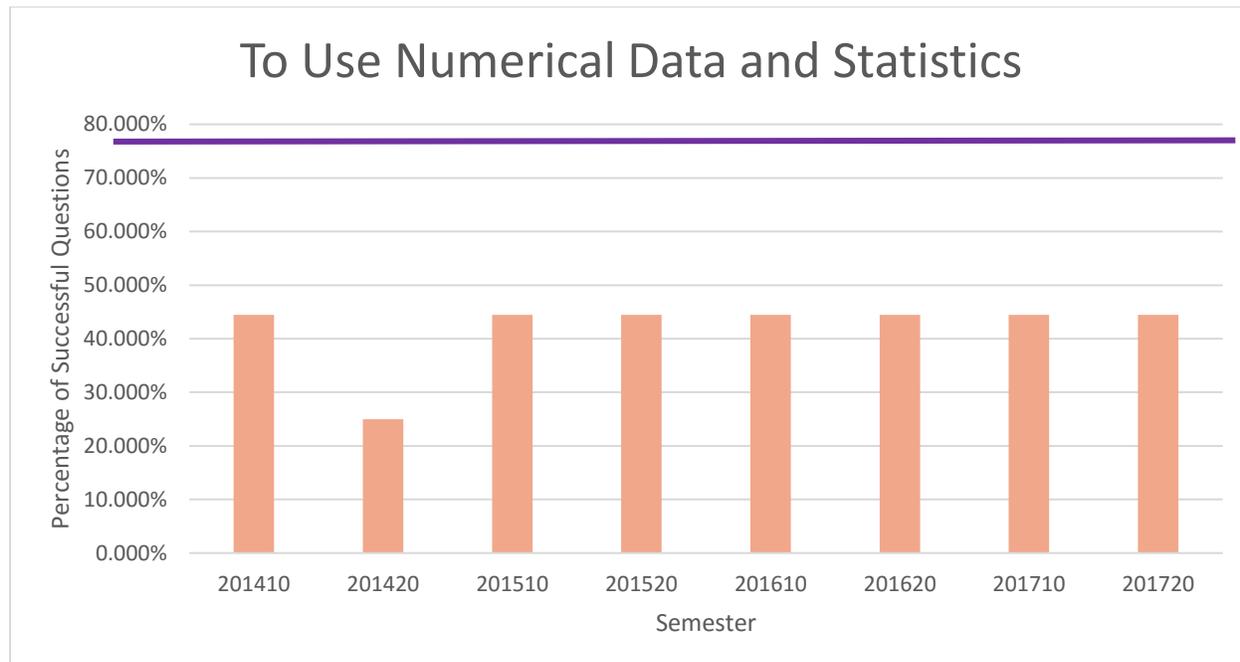
These were the topics covered by the questions reviewed:

- Extracting a particular piece of data from a table of data.
- Construct a mathematical model based on a set of data and use that model to make predictions.
- Translate a word problem involving statistics into an appropriate mathematical model and find its solution.

**Acceptable target:** A question will be considered successfully answered if 70% of students chose the correct answer. Our target is to have 70% of the chosen questions successfully answered.

**Ideal target:** A question will be considered successfully answered if 70% of students chose the correct answer. An ideal target would be to have 100% of the chosen questions successfully answered.

## Findings:



Based upon data derived from these assessments, students from 2014 to 2016 failed to achieve the acceptable target.

## Analysis:

**Academic Year 2014-2015:** What happened – why did it happen – what are we did we do about it.

In the fall of 2014, 9 questions were elected for analysis. 4 of those questions were successful. This gave us a  $4/9 = 44.4\%$  success rate.

In the spring of 2015, 9 questions were again selected for analysis. 4 of those questions were successful. This gave us a  $4/9 = 44.4\%$  success rate.

Acceptable Target: We were far short of our goal in both semesters.

Ideal Target: Not approaching.

**Analysis:** Discussions with faculty revealed that some instructors were under the mistaken impression that some topics on the Finite Mathematics syllabus were optional. This included topics in the areas covered by this competency. This was discussed at a faculty meeting. Hopefully, we will see some improvement.

**Academic Year 2015-2016:** What happened – why did it happen – what are we did we do about it.

In the fall of 2015, 9 questions were elected for analysis. 4 of those questions were successful. This gave us a  $4/9 = 44.4\%$  success rate.

In the spring of 2016, 9 questions were again selected for analysis. 4 of those questions were successful. This gave us a  $4/9 = 44.4\%$  success rate.

Acceptable Target: We did not meet our goal either semester.

Ideal Target: Not approaching

**Analysis:** Our results show no improvement. We decided to conduct a more intensive faculty in-service to discuss the actual question that students had struggles with.

**Academic Year 2016-2017:** What happened – why did it happen – what are we did we do about it.

In the fall of 2016, 9 questions were selected for analysis. 4 of these questions were successful. This gave us a  $4/9 = 44.4\%$  success rate.

In the spring of 2017, 9 questions were selected for analysis. 4 of these questions were successful. This gave us a  $4/9 = 44.4\%$  success rate.

Acceptable Target: Our results for AY1617 were almost identical to AY1516. We remain far short of our goal.

Ideal Target: Not approaching

**Analysis:** Our lack of progress seems to indicate a need for a different approach. We met at the conclusion of the spring semester to discuss this.

### **Decision / Recommendation.**

In May 2017, we held a faculty meeting to discuss this data. We identified these concerns with our approach to measuring the two outcomes:

- The data we collect is aggregated in a way that makes it difficult to tease out what our problems are. It is impossible to tell whether our problems are with a few individuals or if different students are struggling with different concepts.
- We are not assessing several important groups of students:
  - Online students
  - Students at the Leesville and Shreveport campuses

- Students who take other core sequences – Biology, Engineering Technology, Mathematics Education, and Mathematics majors

To address these concerns, we are proposing a new approach. A committee is currently working on a new assessment tool. This will be a separate assignment for each outcome which will be available through Moodle. It will be administered to all students in their last core mathematics course (MATH1060, 1090, 1100, 1810, 2010, or 2110). The plan is to pilot this approach in classes during Summer 2017.

*The above data is from Taskstream TK20, the University's assessment management system.*