



Rappahannock Community College 2018-19 Report on Quantitative Literacy

What does Quantitative Literacy mean at RCC?

Quantitative Literacy is the ability to perform accurate calculations, interpret quantitative information, apply and analyze relevant numerical data, and use results to support conclusions.

RCC degree graduates will calculate, interpret, and use numerical and quantitative information in a variety of settings.

How are RCC degree graduates expected to use Quantitative Literacy skills?

Student Learning Outcomes (SLOs) are defined to guide the instruction of Quantitative Literacy skills.

RCC degree graduates will:

- a. use logical and mathematical reasoning within the context of various disciplines;
- b. interpret and use mathematical formulas;
- c. interpret mathematical models such as graphs, tables, and schematics and draw inferences from them;
- d. use graphical, symbolic, and numerical methods to analyze, organize, and interpret data;
- e. estimate and consider answers to mathematical problems in order to determine reasonableness;
- f. represent mathematical information numerically, symbolically, and visually using graphs and charts.

How are RCC students doing?

RCC General Education Assessment

In Spring 2019, a sample of 120 degree graduates took an *RCC General Education Assessment* that included five Quantitative Literacy items. All items were multiple choice and placed in the context of a real life problem. Three of the items had high success rates of 84%, 86%, and 88%. Two items posed a challenge for the students. All items assessed SLO a: RCC degree graduates will use logical and mathematical reasoning within the context of various disciplines.

Only 56% of the students correctly answered the question that assessed SLO b: RCC degree graduates will interpret and use mathematical formulas. Thirty-nine percent of the students used an incorrect formula. The difference between perimeter and area are basic life skill mathematics formulas. Only 33% correctly answered an item that included interpreting a graph. Both of these questions involved a two-step process indicating the need for critical thinking skills as well as quantitative skills. Students also admitted reading these questions quickly but not thoughtfully.

Students were much more successful on another item that involved interpreting a graph with 88% choosing the correct answer. The correct results of the assessment of the other SLOs were:

- SLO a: RCC degree graduates will use logical and mathematical reasoning within the context of various disciplines. – 84%
- SLO e: RCC degree graduates will estimate and consider answers to mathematical problems in order to determine reasonableness. -- 86%

Common Course Assessment

At the end of each semester, there are common final exam questions that all sections of a course use to assess the performance of students. These questions are mapped to the General Education Quantitative Literacy objectives. In all courses a benchmark of 60% has been set.

Assessments in six math courses were analyzed in Fall 2018. Overall, five of the classes met the 60% benchmark. Math 162, PreCalculus II, had an overall success rate of 54.1%. In addition to the overall assessment, individual items are analyzed on each test to identify areas of improvement by class.

RCC Graduating Student Survey

Students' confidence in their quantitative skills is measured each spring on the *RCC Graduating Student Survey*. Students are asked to rate their ability when they entered RCC and now that they are graduating. Two items assess their quantitative literacy confidence. When asked to rate their ability "To read, interpret and analyze graphs and tables," 42% marked excellent when they entered and 68% at graduation. Eighteen percent said fair or poor at entry but only 2% at graduation. On the ability "To perform basic mathematical operations," 47% marked excellent when they entered and 71% at graduation. Seventeen percent said fair or poor at entry but none at graduation.

Other disciplines report supporting Quantitative Literacy in their classes. Assignments and assessments interpret and use mathematical formulas; interpret mathematical models such as graphs, tables, and schematics and draw inferences from them; use graphical, symbolic, and numerical methods to analyze, organize, and interpret data; estimate and consider answers to mathematical problems in order to determine reasonableness; and represent mathematical information numerically, symbolically, and visually using graphs and charts. Assignments and results were formally reported in accounting, economics, biology, psychology, physics, and chemistry. Science classes have a goal of teaching graphing within each specific discipline.

How are assessment results used?

The mathematics faculty assumes the main responsibility for quantitative literacy but collaborates with all degree faculty to assure that students apply quantitative literacy into all disciplines in preparation for their future studies and careers. The mathematics faculty meet regularly, discuss the assessment results, and look for improved success of students. In 2018-19 results led to the recommendation that students be allowed to use formula sheets in Math 162 which is formula heavy. The practice of using formula sheets models the practice of relying on references in the work world. This is a good practice for advanced and work specific formulas. The basic concepts of perimeter and area should be reinforced in application in other courses. Students should not need formula sheets for these.

The entire Arts and Sciences for Transfer Degree faculty meet and review all general education assessments. As explained above many courses support the quantitative literacy in their classes.