

GES3: Solve problems using Quantitative Reasoning

MATH 1016- Statistics

Semester: FALL 2013

REPORT DATE: 1/8/2014

Quantitative Reasoning is assessed in Math 1016 based on the student's final project using the AAC&U Quantitative Literacy Value Rubric. The project and rubric were used in all sections of the course. This statistics course has students at the Freshman through Senior level. The course serves as an introduction to descriptive and inferential statistics. The topics include graphical representation of data, characteristics of distributions, statistical models, correlation, regression, confidence intervals and hypothesis testing. Math 1016 focuses on techniques and application rather than theory. It is a blend of collaborative learning, technology, written and oral reports. Attention focuses on student understanding of the uses of statistics and the correct application and analysis of statistical methods and results.

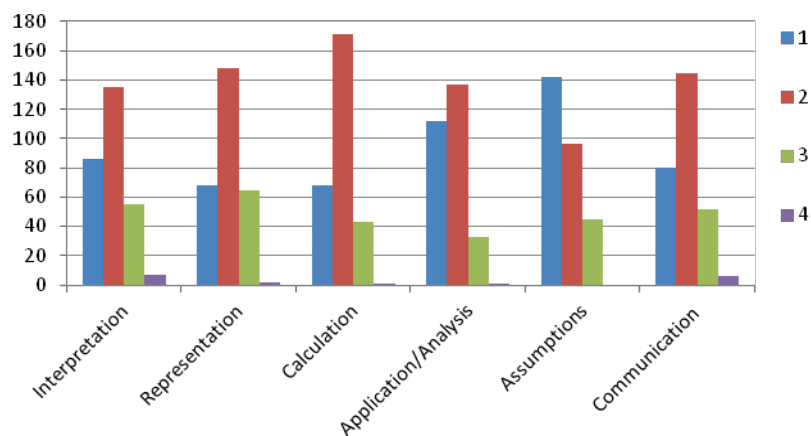
Number of students: 283

Number of sections: 11

Analysis:

Criteria	Mean	Median
Interpretation	1.94	2
Representation	2.00	2
Calculation	1.92	2
Application/ Analysis	1.73	2
Assumptions	1.66	1
Communication	1.94	2

Distribution of Scores:



Analysis:

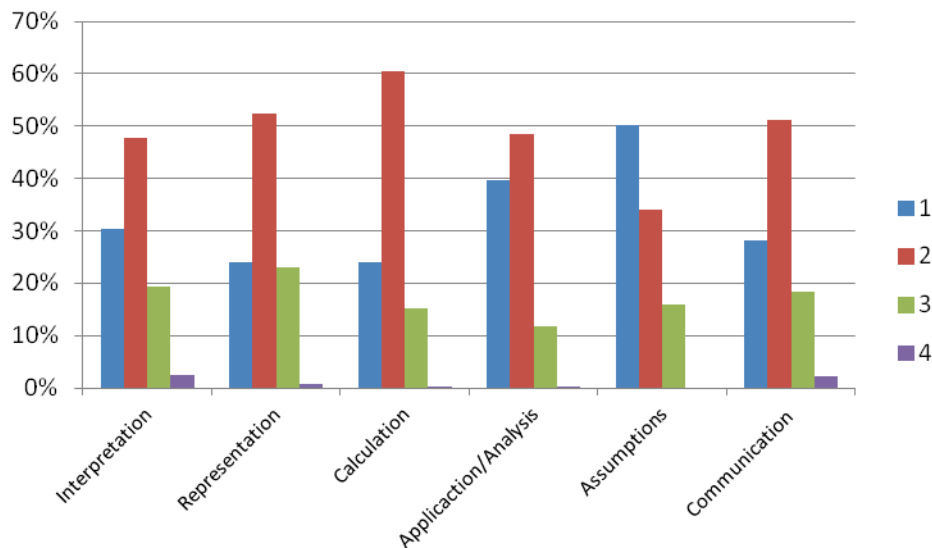
Criteria	Scored at level 2 or above
Interpretation	70%
Representation	76%
Calculation	76%
Application/ Analysis	60%
Assumptions	50%
Communication	72%

Distribution of Scores:

	Interpretation	Representation	Calculation	Application/ Analysis	Assumptions	Communication
1	86	68	68	112	142	80
2	135	148	171	137	96	145
3	55	65	43	33	45	52
4	7	2	1	1	0	6
Total	283	283	283	283	283	283

Percentages of score

	Interpretation	Representation	Calculation	Application/ Analysis	Assumptions	Communication
1	30%	24%	24%	40%	50%	28%
2	48%	52%	60%	48%	34%	51%
3	19%	23%	15%	12%	16%	18%
4	2%	1%	0%	0%	0%	2%
Score at level 2 or above	70%	76%	76%	60%	50%	72%



Discussion/Action/Closing the Loop:

At the end of this course the student is responsible for completing a final project. In this project they must create the statistical test, gather and analysis data, draw conclusions, make predictions and communicate the results (See the appendix for the guidelines of the project). These findings are written in a paper and presented to the class. As the initial implementation of this rubric to the final paper it was assumed that the course would fall around low intermediate level, with an average score of 2. The content of the course is set and delivered in such a way that a score of 2 on the rubric is a reasonable expectation.

The students do best in their ability to convert information/data into graphs and equations and to perform calculations; with over 75% of the students reaching or exceeding the expected level 2. This concept is seen when the data is put into the scatterplot, the regression line is calculated and then used to make predictions. The students scored the lowest in their ability to make assumptions (50% failed to meet level 2), followed by application/analysis (40% failed to meet level 2).

To hopefully improve this weakness with assumptions, specific lessons will be designed that go into more detail on this topic. There are many assumptions involved in linear regression. To date, so far, the discussion has been predominately on assumptions involving the sample; that is large enough and is it representative of the population. We will now introduce and focus on another assumption- that all predictors are linearly independent. These models will be used throughout all sections in the upcoming Spring semester, by incorporating this new concept into classwork, homework and the final project. Also, we will better define the assumption requirement in the final project guidelines.

There will be two changes put into effect this Spring semester to better improve teaching and learning. First, there will be departmental group work and hands on activities, beside the project, that will be used in every section of the course. A student learns best when actively engaged in the process. Second, all faculty teaching this course will meet once a month; with a focus on the topic of assumptions and rubric norming. These meetings will also serve as a time for collaborative discussions on the best, and worst, practices in the classroom.

