Degree/Certificate: Bachelor of Arts in Education

Major/Option: Mathematics/Elementary Major and Mathematics/Elementary Major with Middle Level Mathematics Endorsement Option

Submitted by: Mathematics Education Committee

Date: October 29, 2014

Part I – Program SLO Assessment Report for 2013-14

Part I – for the 2013-14 academic year: Because Deans have been asked to create College-Level Summary Reports annually, the template has been slightly modified for a) clarity for Chairs and Directors, and b) a closer fit with what the Deans and Associate Deans are being asked to report.

1. **Student Learning Outcome**: The student performance or learning objective as published either in the catalog or elsewhere in your department literature.

   Demonstrate conceptual understanding and procedural facility of statistics and probability.

2. **Overall evaluation of progress on outcome:** Indicate whether or not the SLO has been met, and if met, to what level.
   _____*SLO is met after changes resulting from ongoing assessments, referencing assessment results from the previous year to highlight revisions;*
   _____*SLO is met, but with changes forthcoming;*
   __*x*___*SLO met without change required.*
   ➡ *Please note that we are continuing to make adjustments to our program to improve our students' meeting of this SLO.*

3. **Strategies and methods:** Description of assessment method and choices, why they were used and how they were implemented.

   Math 211 is a mathematics content course designed to give future K–8 teachers a basis for understanding elementary school mathematics. Topics include sets, number systems, functions and relations, operations on whole numbers, decimals and fractions, integers, percents, ratio and proportions and data analysis. In the winter of 2014, twenty-seven prospective elementary math majors took Math 211. The work of learning for this class consists of active class participation, homework, two quizzes, two tests, and one final exam. One item was chosen from the final exam as the assessment of the SLO of 2013-14 :

The LifeSpan of a Battery is measured in terms of how many hours the Battery lasts. Suppose that the lifespans of BuyRite Batteries are known to be normally distributed, with a Mean ($\bar{x}$) lifespan of 414 Hours, and a Standard Deviation (s) of 20 Hours.

a)   What is the probability that a randomly-chosen BuyRite Battery lasts between 394 and 454 Hours?

b)   If 1200 BuyRite Batteries are examined, then about how many of them would be expected to have a lifespan less than 394 Hours ?

This item checks student understanding of the empirical rule, the use of z-scores to obtain probabilities related to a normal distribution, and the application of probability to obtain a quantitative result. The directions required a detailed rationale to achieve full credit (where the rationale included a labeled sketch as well as the computational set-up for finding z-scores). The item was graded on a scale of 1-5 points.

4. **Observations gathered from data**: Include findings and analyses based on the strategies and methods identified in item #3.

   a. Findings:
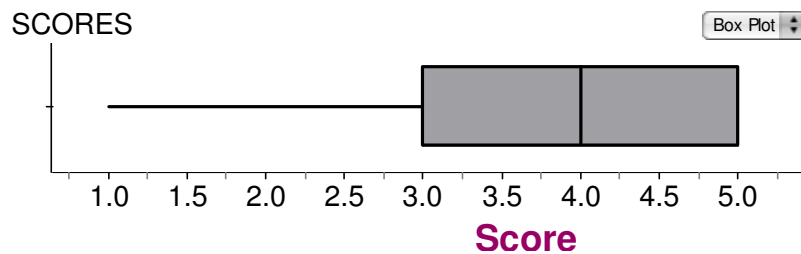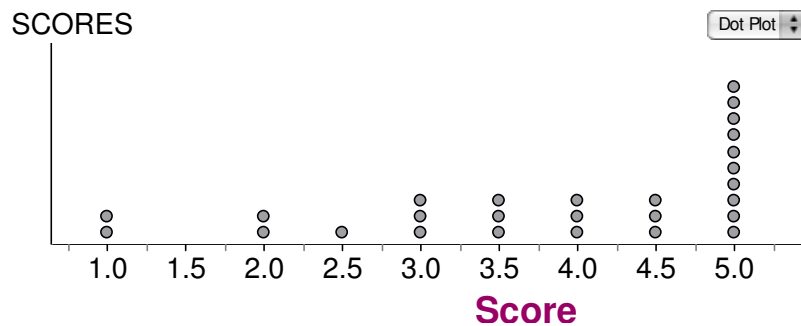
Score	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Percents of students	7.4%	0.0%	7.4%	3.7%	11.1%	11.1%	11.1%	11.1%	37.0%

b. Analysis of findings:

It was heartening to see over 80% of students achieve a score of at least 3 points (out of 5 possible). For the more than one-third of students who achieved the highest possible score, their work included diagrams and computational set-ups that provided evidence of conceptual understanding and procedural facility of the statistics and probability embodied by the task.

5. **What program changes will be made based on the assessment results?**

a) Describe plans to improve student learning based on assessment findings (e.g., course content, course sequencing, curriculum revision, learning environment or student advising).

No changes are seen as indicated regarding the content, instruction, or sequencing of the topic. This diagnosis is based on the positive overall student results on the task. However, it is noteworthy that this topic was addressed in-class towards the end of the quarter, when overall attendance was lagging. It is an open conjecture as to how in-class attendance might affect performance on this task.

b) Provide a broad timeline of how and when identified changes will be addressed in the upcoming year.

Mathematics education faculty will discuss ways to emphasize with students the importance of consistent attendance in their courses. Particularly regarding courses that are in their major (such as MATH211 for the elementary math majors), the interactive and participatory nature of those courses make it so that the greatest learning takes place by being engaged in class.

6. Description of revisions to the assessment process the results suggest are needed and an evaluation of the assessment plan/process itself.

The evaluation process was effective; no revisions are necessary.