COURSE SLO ASSESSMENT REPORT, SCC

Department: Earth, Space, and Physical Science Course: Chem 219

Year: 2013 Semester: Fall

1) Outcome to be assessed	SLO A: "Identify the essential parts of a problem and apply known chemical concepts in solving the problem"
2) Means of assessment and criteria of success	As a method of assessment, we used a common final exam as 25 multiple choice questions to give to all four sections assessed. The exam had some concept questions and some calculation based problems. Success is achieved when at least 70% of the students score 60% or higher correct on the common multiple choice questions.
3) Summary of data collected	Number of students assesses: 70 Number of sections: 3 Average correct answers for each instructor: 15.83(63.3%), 14.55(58.2%) Average answers for all sections combined: 15.37(61.5%) 52(74.3%) of the students scored at least 60% correct on the assessment.

4) Analysis of data	From the data, these questions had a low correctness (less than 50%). Question #10 (Molecular geometry) 45.3% correct Question #16 (Bonding:Molecular polarity) 44.3% correct Question #19 (Attractive Forces:Ordering substances in order of mp) 30.0% correct Question #20 (Colligative Properties: Freezing point depression) 34.3% correct Question #22 (Atomic Structure: Ionic radius) 37.1% corrects Question #23 (Phases of Matter) 31.4% Unlike the previous years assessment (before 2011), the poor scoring questions seem to be evenly distributed throughout the exam. By changing the length of the assessment, test fatigue has been minimized. There were 6 questions(10, 16, 19, 20, 22, & 23) that had low correct response rates(less than 50%). Even though these questions did not show high success, the scores did improve from the previous year. An improvement is being made. Question #10 is difficult for many students because they rely often on models. The students were not allowed to used models on the exam. They needed to visualize the molecules as three dimensional particles. Question #16 is often a problem for students due to the fact the question involves so many concepts (Lewis structures, VSEPR, bonding polarity, & molecular polarity). If one mistake in any of these concepts is made by the student, their answer will lead to an incorrect answer. Question #19 is an extension of Question #16 with an addition of a few concepts (intermolecular attractions and physical properties). Any mistake made by any of the concepts leads to an incorrect answer. The other poor scoring questions(20,22, & 23), is hard to guess what students are misinterpreting. To get a better understanding of the students' "disconnect" and analysis must be made of what the students answered incorrectly with.
5) Plan of action/what to do next	**The SLO was achieved** because 52(74.3%) of the students scored at least 60% correct on the assessment. There is no plan of action as the SLO was met.

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<table>
<tr><td>1) Outcome to be assessed</td><td>SLO B: “Write in scientific terms and explain observed scientific phenomenon using the language of Chemistry”
SLO C: “Perform experiments with the given directions, collect valid scientific data, analyze the data and interpret laboratory results”</td></tr>
<tr><td>2) Means of assessment and criteria of success</td><td>As a method of assessment, we used laboratory reports as a way to assess both B and C in SLOs. A full laboratory report of Experiment #9 (Determination of the Concentration of Vinegar and the Molar Mass of an Unknown) will be used to assess these SLOs. A rubric will be used to standardize grading of the lab report and help identify the features we are looking for in students’ performance. The students are asked to perform the volumetric analysis experiment over 3 laboratory periods. Directions to perform the experiment are given in the laboratory manual. The students will be evaluated on their ability to follow procedure, collect their data and perform the necessary calculations. Success is achieved when at least 70% of the students score earn a competent or accomplished score on the lab report.</td></tr>
<tr><td>3) Summary of data collected</td><td>Number of students assesses: 90
Number of sections: 4

<table>
<tr><th></th><th>Missing
0</th><th>Beginning
1</th><th>Competent
2</th><th>Accomplished
3</th></tr>
<tr><td>Purpose</td><td>1(1.1%)</td><td>3(3.3%)</td><td>11(12.2%)</td><td>75(83.3%)</td></tr>
<tr><td>Procedure</td><td>1(1.1%)</td><td>0(0%)</td><td>10(11.1%)</td><td>79(87.8%)</td></tr>
<tr><td>Data and Results</td><td>1(1.1%)</td><td>4(4.4%)</td><td>16(17.8%)</td><td>69(76.7%)</td></tr>
<tr><td>Calculations</td><td>4(4.4%)</td><td>5(5.5%)</td><td>19(21.1%)</td><td>62(68.9%)</td></tr>
<tr><td>Accuracy (% acetic acid)</td><td>0(0%)</td><td>42(46.7%)</td><td>17(18.9%)</td><td>31(34.4%)</td></tr>
<tr><td>Accuracy (Molar Mass)</td><td>2(2.2%)</td><td>39(43.3%)</td><td>24(26.7%)</td><td>25(27.8%)</td></tr>
<tr><td>Conclusion</td><td>4(4.4%)</td><td>4(4.4%)</td><td>30(33.3%)</td><td>56(62.2%)</td></tr>
</table>
85(94.4%) of the students earned competent or accomplished on the assessment.</td></tr>
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4) Analysis of data	The lowest scoring portion of the assessment was the determination of the molar mass of the unknown acid. This leads to a very confusing result. In previous years, the Molar Mass results were higher than the Acetic Acid % results. This was contributed to the fact that by the time the student performed the Molar Mass of the Unknown Acid, they had a much stronger grasp on the concepts being tested and better technique in titration. But this year, the results are backwards. No explanation can be made. There was a slight increase in the average score in this years conclusions(2.41) from the previous years conclusion(lowest scoring section) of 2.31. No conclusions can be made about the slight increase in this score. Students were quite strong in presenting data and calculations in a clear and logical manner.
5) Plan of action/what to do next	**The SLO was achieved** because 85(94.4%) of the students earned competent or accomplished on the assessment. Overall the students preformed well concerning the SLOs assessed. One of the areas of improvement should be made towards the students' effort given to writing a conclusion. A solution to this issue is when the students write their conclusion. After the student completes their data analysis in their duplicate notebook, they must write out a proper conclusion. Then the instructor should have to review the conclusion before the student can leave the lab room. The other area of improvement is the results of the Acetic Acid % and Molar Mass of the Unknown Acid. The instructor should make it a point to make sure that the students have a good grasp in the proper techniques of titration. The result from this year may just be an anomaly. Previous years the students scored well on these results.