# Assessment: Assessment Unit Four Column

*Spring/Summer 2017*

## El Camino: PLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)

| *PLOs* | *Assessment Method Description* | *Results* | *Actions* |
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| **PLO #2 Use of Scientific Instruments -** Students will demonstrate the use of instruments to gather data.<br>**PLO Status:** Active<br>**PLO Assessment Cycle:** 2016-17 (Spring 2017)<br>**Input Date:** 11/12/2013 | **Performance -** Student will view prepared microscope slides of cells, tissues, or microorganisms, focus on them, and identify them under the compound microscope.<br>**Standard and Rubric:** Standard rubric used to assess student success was determined by the following levels of proficiency.<br>Level 1 The student is unable to locate the specimen on the slide under the microscope. (Not proficient)<br>Level 2 The student can locate the specimen on the slide, but cannot focus on the specimen. (Minimal proficiency)<br>Level 3 The student can locate the specimen, get it into focus, but cannot identify the specimen. (Proficient)<br>Level 4 The student can locate the specimen, get it into focus, and identify the specimen. (Very proficient)<br><br>Note that the Microbiology 33 | **Semester of Current Assessment:** 2016-17 (Spring 2017)<br>**Standard Met:** Standard Met<br>Allied Health Science Program Level Microscope SLO Data Spring 2017<br><br>Anatomy 30 Section# Total Students Level 1 Level 2 Level 3 Level 4<br>1111 26 0<br>0 19 7<br>1002 38 1<br>4 8 25<br>Sum 64 1<br>4 27 32<br>Percentage 1.6%<br>6.3% 42.2% 50.0%<br>Anatomy 32 Section# Total Students Level 1 Level 2 Level 3 Level 4<br>1005 39 2<br>4 5 28<br>1006 25 0<br>0 7 18<br>1010 26 0<br>0 5 21<br>1012 27 2<br>1 2 22 | **Action:** During faculty discussions of the data, some suggestions were made for teaching strategies to improve student learning. One instructor with above average results said that she employed a pretest to assess student weak points in microscope use, then encouraged her students to improve their techniques, telling them that they would be tested on their microscope use. Finally, she administered a post-test in which the students demonstrated their use of the microscope.<br><br>Another instructor used a more individual approach, in which she went to each student in her classes during lab and had them place a slide on their microscope, focus on a specimen and identify the specimen. If they weren't able to do one or more of these tasks, it became a teachable moment in which the instructor could coach each student in good |

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| | course used the following modified version of the above rubric:<br>Level 1- the student is unable to locate the specimen (i.e., Gram – and Gram + cells and their cell shapes. (Not proficient)<br>Level 2 - The student can locate the speciman, get it into focus, but can't identify Gram- and Gram+ cells. The student can identify some cell shapes. (Minimal proficiency)<br>Level 3 – The student can locate the specimen, get it into focus, and identify Gram- and Gram+ cell and most of the cell shapes. (Proficient)<br>Level 4 – The student can locate the specimen, get it into focus, and identify Gram- and Gram+ cells and their cell shapes. (Very proficient)<br><br>**Additional Comments:** Success was determined by the number of students who were assessed at levels 3s and 4s. For this student population, if the student was able to locate the specimen and get it into focus this was acceptable. For those students who were also able to identify the specimen (level 4s) this reflected a higher level of proficiency. A proficiency level of 75% or above would be considered a satisfactory success rate.<br>**Related Documents:**<br>MicroscopeSLOProgramLevelReportF17.docx | 1009 26 0<br>3 11 12<br>1008 25 0<br>2 10 13<br>1007 30 0<br>1 4 25<br>Sum 198 4<br>11 44 139<br>Percentage 2.0%<br>5.6% 22.2% 70.2%<br>A & P 34A Section# Total Students Level 1<br>Level 2 Level 3 Level 4<br>1015 13 1<br>0 1 11<br>1020 17 0<br>0 8 8<br>1019 23 0<br>0 2 21<br>Sum 1<br>0 11 40<br>Percentage<br>1.9% 0.0% 20.8% 75.5%<br>A & P 34B Section# Total Students Level 1<br>Level 2 Level 3 Level 4<br>1021 33 2<br>1 5 25<br>1022 16 1<br>0 2 11<br>Sum 49 3<br>1 7 36<br>Percentage<br>6.1% 2.0% 14.3% 73.5%<br>Physiology31 Section# Total Students Level 1<br>Level 2 Level 3 Level 4<br>1703 33 0<br>0 3 30<br>1700 30 0 | microscope technique. Both of these methods of instruction could be used to improve student mastery of the microscope.<br><br>No changes are needed to the curriculum, but some modification of the Microscope Student Learning Outcome rubric would be desirable. It could be modified to include a fifth category, such as: "Students can find a specimen on a microscope slide, focus on it with the low power objective lens as well as the high power lens, and identify the specimen." This would make the comparison of the Anatomy, Physiology, and Microbiology students' use of the microscope somewhat more equitable.<br><br>There are several ways that El Camino College can support our recommendations for the improvement of this Student Learning Outcome. First, the Health Science Program allegedly has a service agreement with Cal-Ed Optical company, which is supposed to regularly provide cleaning and adjustments to the microscopes following each semester or as needed. However, many microscopes have malfunctioning electrical cords and loose fixtures, such as light mounts, mechanical stages, etc. that need repair. Cal-Ed Optical should be informed that these |

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| | | 0 1 29<br>1704 30 0<br>2 3 25<br>1705 25 0<br>2 2 21<br>Sum 118 0 4<br>9 105<br>Percentage<br>0.0% 3.4% 7.6% 89.0%<br>Microbiology 33 Section# Total Students Level 1<br>Level 2 Level 3 Level 4<br>1500 38 0<br>1 5 32<br>1504 38 5<br>6 14 13<br>1502 34 3<br>5 13 13<br>41<br>1 6 8 26<br>Sum 151 9<br>18 40 84<br>Percentage<br>6.0% 11.9% 26.5% 55.6%<br><br>Students in the Physiology 31 were the most proficient in their use of the microscope, 89% scoring at level 4 (very proficient), with a combined average of 96.6% scoring at levels 3 (proficient) and 4. This was followed by students in Anat. 34A (75.5% at level 4 and 96.3% scoring at levels 3 and 4), Anat. 32 (70.2% scoring at level 4 and 92.4% at levels 3 and 4), and Anat. 34B (73.5% scoring at level 4 and 87.8% at levels 3 and 4). The percentage of Anatomy 30 students at level 4 was the lowest, at 50%, but their combined levels of 3 and 4 was 92.2%. Students in Microbiology 33 averaged 55.6% at level 4, with a combined average of 82.1% at levels 3 and 4 as shown in the table and chart below. All of the courses assessed exceeded the goal of 75% of students achieving level 3 or 4 in the use of the microscope. (See the attached data sheet for a graph of | items need repair. If Cal-Ed Optical cannot perform these repairs, perhaps another company should be found to replace their services. This would maintain the good quality microscopes that we have and provide students with the best opportunity to learn how to adjust the fine details in their field of view.<br><br>Second, we need to consider purchasing more new microscopes to replace those that can no longer be repaired or adjusted. Some new microscopes were purchased and are greatly appreciated, but some rooms, such as LS-130 (Microbiology) still have several older microscopes that need replacing.<br><br>Third, many of the microscope slides in the classes have faded with time, making it very difficult to find and focus on the specimens on them. Some that come immediately to mind include the simple squamous epithelium and mitosis slides. It would be beneficial to replace the slides that have deteriorated.<br><br>(09/12/2017)<br>**Action Category:** Program/College Support |

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these results.)

| Proficiency Level by Course | Level 1 | Level 2 | Level 3 | Level 4 |
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| Anat. 30 | 1.6% | | 6.3% | 42.2% 50.0% |
| Anat. 32 | 2.0% | 5.6% | 22.2% | 70.2% |
| Anat. 34A | 1.9% | 0.0% | 20.8% | 75.5% |
| Anat. 34B | 6.1% | 2.0% | 14.3% | 73.5% |
| Physio. 31 | | 0.0% | 3.4% | 7.6% 89.0% |
| Micro. 33 | 6.0% | 11.9% | 26.5% | 55.6% |

The data implies that in the higher level courses, such as Physiology 31, Anatomy & Physiology 34A and 34B, and Anatomy 32, students demonstrated greater mastery of the microscope than those in the entry level Anatomy 30 course. One reason could be that students in these courses (except for Anatomy 32) have already successfully completed other prerequisite science courses, and have therefore had previous experience in handling scientific instruments, such as microscopes.

Microbiology 33 is an exception to the previous statement because students in those classes exhibited less proficient microscope use in terms of their combined level 3 and 4 percentages, even though they had already completed an Anatomy prerequisite. However, Microbiology requires the use of the oil immersion lens, which requires greater expertise than the use of the low power and high power lenses employed in the other courses, thus is more challenging to master.

Anatomy 30 students had the fewest students achieve a level 4 mastery of microscope use of all of the courses assessed. This is most likely due to the fact that Anatomy

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| | | 30 is a lower level course with no prerequisites, therefore many students in the classes have had no previous experience with microscope use. Also, the microscope is used less frequently in the Anatomy 30 classes than in the other courses, so the students have less practice using the instrument. Moreover, some students had difficulty locating specimens and focusing their slides because those slides were of poor quality. Some slides have faded to the point that the specimens on them can barely be found, let alone be identified. Obviously this is an obstacle to students attempting to demonstrate their proficiency with a microscope. | |
| | | (09/07/2017)<br>**Faculty Assessment Leader:** Margaret Steinberg<br>**Faculty Contributing to Assessment:** M. Steinberg, T. Bui, S. Trench, J. Padilla, M. Stupy, T. Palos, A. Valle, A. Majewski, Medina, M. Mubarak, P. Reonisto.<br>**Courses Associated with PLO Assessment:** Anatomy 30, Anat. 32 Anat. 34A, Anat. 34B, Physio. 31, Micro. 33 | |