

# Annual Report for Assessment of Outcomes 2011-2012

## Biology: Self-Reflection

Please address the questions below  
send to [learningassessment@pcc.edu](mailto:learningassessment@pcc.edu) by **June 22, 2012**; with Annual Report in the subject line

*Note: Information provided in this report may be inserted into or summarized in Section 2C (LDC/DE) or 6B (CTE) of the Program Review Outline.*

1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out in 2010-2011. These may include but are not limited to changes to content, materials, instruction, pedagogy etc.

The most significant improvements made thus far in response to previous core outcomes assessments has been to the process of assessment. We have made successful efforts to increase our sample size and calibrate scoring rubrics. The members of the SAC have also become more aware of the core outcomes and have started to discuss ways to improve teaching.

**For each outcome assessed this year:**

2. Describe the assessment design (tool and processes) used. Include relevant information about:

- The nature of the assessment (e.g., written work, project, portfolio, exam, survey, performance etc.) and if it is direct (assesses evidence mastery of outcomes) or indirect (student's perception of mastery). Please give rationale for indirect assessments (direct assessments are preferable).

Using a modified version of PCC's stated definition of Self-reflection found at <http://www.pcc.edu/resources/academic/core-outcomes/index.html> we asked the students "How have your academic skills, professional competence, and/or personal beliefs and behaviors changed as a result of your experience in BI 231-233 classes? How do these changes impact others?"

Our approach allowed instructors to assess students' interpretation of their growth in this area. While students responded with their perception of their own self-reflection, the level of mastery was determined by Biology faculty members who reviewed the students' submissions. Directly observing changes in students' skills, behaviors, and beliefs is outside the scope of our classes and we must trust that the students' essays reflect real changes in their lives. That being said, there is some reason to believe that students over-estimate or under-estimate their growth throughout the year-long series. Though the evidence is anecdotal, the instructors' knowledge of changes seen in individual students' skills, beliefs, and behaviors was not always accurately reflected in the students' essays. Based on observations of one instructor, who also scored the essays, many students are underestimating their growth in academic skills and personal beliefs.

- The student sample assessed (including sample size relative to the targeted student population for the assessment activity) process and rationale for selection of the student sample. Why was this group of students and/or courses chosen?

Our target student population was BI 233 (Human Anatomy and Physiology III) students across the district. This group of students was selected because most students in this class are in their fourth term of Biology at PCC (BI 112- Cell Biology for Health Occupations, 231 (Human Anatomy and Physiology I), 232 (Human Anatomy and Physiology II), and 233). In many of these classes, instructors deliberately provide content related improving academic skills and professional competence. This is done by discussing study strategies, recommending study groups, and enforcement of appropriate lab behaviors to ensure safety and students and proper care of equipment.

Additionally, these students are in the last term of a three term sequence of Human Anatomy and Physiology, a course that discusses the form and function of the human body along with the pathologies that occur. Topics covered are varied and include normal function, as well as, the impacts of nutrition, smoking, exercise, and other controllable factors affecting the function of the body. With the wealth of information that is presented to this group of students it is of value to determine how much of this information they apply, not just to further academic achievements, but to their everyday lives.

All BI 233 instructors received, via email, directions for assigning and gathering student essays (Appendix 1). Responses from students were submitted to the SAC subcommittee members for scoring. In response to low participation rates in previous core outcomes assessments, all students in BI 233 were targeted.

- Any rubrics, checklists, surveys or other tools that were used to evaluate the student work. (Please include with your report). Where appropriate, identify benchmarks.

The attached rubric was used to score the student responses on a five point scale (0-4). This rubric is a modified version of the sample indicators found at <http://www.pcc.edu/resources/academic/core-outcomes/co-selfreflection.html>.

- How you analyzed results, including steps taken to ensure that results are reliable (consistent from one evaluator to another).

Once responses were collected, the subcommittee met and each member individually evaluated a small sample of student responses using the scoring rubric. Scores were then compared and we determined that grading results were similar. The total responses were then split between the two subcommittee members to be scored using the rubric. Once all responses were scored the data was pooled.

3. Provide information about the results (i.e., what did you learn about how well students are meeting the outcomes)?
  - If scored (e.g., if a rubric or other scaled tool is used), please report the data, and relate to any appropriate benchmarks.
  - Results should be broken down in a way that is meaningful and useful for making improvements to teaching/learning. Please show those specific results.

All BI 233 instructors received, via email, directions for assigning and gathering students' essays. Responses from students were submitted to the SAC subcommittee members for scoring. Based on the numbers available during the second week of the term, there were 290 students registered for BI 233 across the district. While there were likely some students who did not remain in their classes, and therefore did not respond, it is difficult for us to determine our loss rate between second week enrollment and final enrollment at the time assignments were collected.

Of the 290 students registered for BI 233 in the 3<sup>rd</sup> week of the term, 245 student responses were collected in the 7<sup>th</sup> week of the term. We were pleasantly surprised by the high return rate (84.5%) and recognize that the participation of Biology faculty was much higher in this assessment than for previous assessments. This could be due to an increased understanding of the Core Outcomes assessment process and value. Alternatively, in this assessment individual instructors were not asked to score the students work. In previous assessments, individual instructors were asked to assess their students' work, and then submit the student work and score. Removing this extra step from the process may have contributed to the higher participation rate.

The Biology SAC has stated that on a scale of 0-4, students in BI 112, 231, 232, and 233 should reach a level of two for the core outcome of Self-Reflection <http://www.pcc.edu/resources/academic/core-outcomes/bi.html>. For this assessment, student responses were scored on two different aspects of self-reflection: "reflection on self" and "responding to others".

### **Reflection on Self:**

In this first attempt to measure self-reflection in students at the end of this series, we were pleased that the average score for reflection on self was 2.6 (on a scale of 0-4). 80% of students' responses met our stated goal and were scored at 2 or higher (28.2% at level 2, 38.4% at level 3 and 14.3% at level 4). Of the 20% of student responses that did not reach a level 2 score, 15.1% scored 1 and 4.1% received a score of 0.

The students demonstrated their ability to reflect on their own growth in a variety of ways. Most made some mention of improvements to academic skills. Many mentioned an increased professional competence due to the vocabulary and understanding of concepts gained in BI 231-233. This recognition of an increase in professional competence was most often stated by students who also stated that they are already working in the health care field or that they learned using case studies in class. Many students stated that they use their knowledge of the human body to guide their decisions regarding exercise, diet, and alcohol and tobacco use. Surprisingly, students did not mention that proper lab safety and equipment care were aspects of professional competence that they gained from this series of classes.

### Responding to Others:

The results for “responding to others” were less positive. The average score for responding to others was 1.5 (on a scale of 0-4). Only 52% of students’ responses met our stated goal and were scored at 2 or higher (28.6% at level 2, 15.9% at level 3, and 7.4% at level 4). Of the 48% of student responses that did not reach a level 2 score, 11.8% scored a 1 and 36.3% received a score of 0.

Many students did not demonstrate any understanding that their behaviors and beliefs impact others (36.3%). Many students recognized the impact being in school has had on their social lives (this was most often scored as a 1). Others recognized that they now have the knowledge to serve as better health care providers (this was most often scored as a 2). Still others provided specific examples of how they can use their new knowledge to advise friends, family, and patients (this was most often scored as a 3). A few students demonstrated their understanding that by sharing their increased knowledge of the human body there could be a positive impact on community health. Only a few individual students recognized that there may be competing beliefs and values that create barriers for healthy lifestyle choices in others. These last two response types most often received a score of 4).

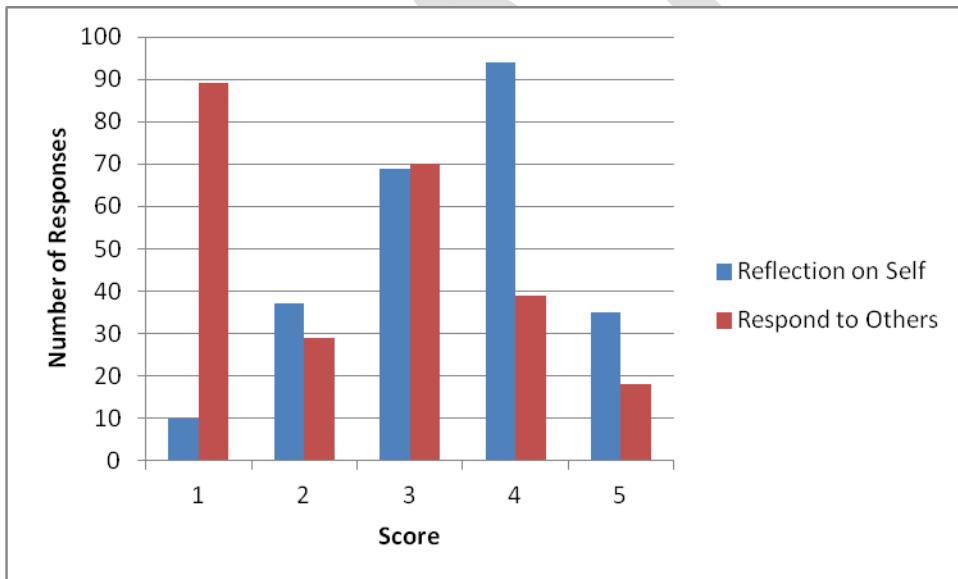


Figure 1: Shows the total number of student responses at each scoring benchmark.

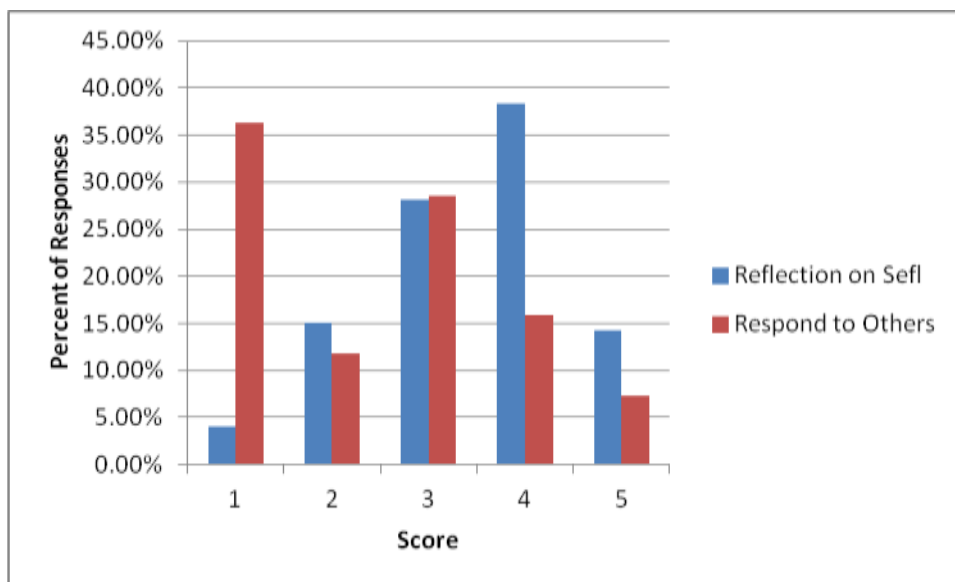


Figure 2: Shows the percent of student responses at each scoring benchmark.

4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).

As this is our initial attempt to assess self-reflection in the context of Biology, we have gained valuable information about how self-reflection is currently manifested in our students. Any changes will depend on the goals of the Biology SAC for self-reflection development in our students. During our fall SAC meeting, we plan to discuss the results of this assessment and determine what we want self-reflection in our students to look like moving forward. Do we want the students to be self-reflective of their study skills and time management, to analyze the costs to their families and friends and how they can apply this to future academic pursuits and life in the workplace? Do we want them to be self-reflective of the material presented and how this knowledge changes the choices they make on a daily basis regarding their personal health and the health of those people with whom they interact? Do we want them to gain an appreciation and understanding for the beliefs of others in the context of biology?

While members of the subcommittee believe that all aspects of student self-reflection listed above should improve while in our classes, students primarily focused on study skills and time management in their responses. While many students did address their choices in daily life, most did not demonstrate awareness or respect for the beliefs of others. In many cases, students indicated that they share their knowledge about daily choices related to health with friends and family. While this was interpreted as a positive in terms of their score on responding to others, we have concern that this is occurring in the absence of recognition of how the beliefs of others may be challenged by such advice. Sensitivity in relaying this information respectfully was not often demonstrated in the student responses.

Some instructors in BI 112, 231, 232, and 233 do incorporate assignments that ask students to self-reflect on their learning. The focus of these assignments has been on study skills, time management, or the usefulness of the content when reading

primary literature in the field. Additionally, topics in the series often have a component focused on health and the impact lifestyle choices have on the normal function of the body. Given the nature of these assignments and content, and the little focus given to the diversity of beliefs of others in the context of Human Anatomy and Physiology, it is not surprising that students chose to focus on academic skills and personal choices related to health in their responses rather than an awareness of and respect for the beliefs of others. A request to add to the Biology SAC agenda a discussion with the full SACs regarding our goals and ideas for meaningful improvement has been made. Unfortunately, our next meeting is not scheduled until fall term so we can not include the final SAC thoughts in this document.

While the potential for meaningful improvements exists, we will need to be mindful to not choose a plan for our courses that consists of simply requiring us to design projects and assignments that require students to focus on what we (or the powers directing the assessment process) want them to gain throughout the year, so that by the time the summative assessment occurs, the students will have been “programmed” to provide the answer we desire when we give them the Pavlov type prompt. Somehow this type of assessment seems to be the antithesis of what education should be as we should be teaching students to be innovative free-thinkers who use critical thinking skills in the interpretation of data and the application of the data either in efficient manners or in novel situations that show intellectual growth. A tool such as this is not designed to measure such things, but to place it in a box. This is a great strategy if our desire is to create workers for an assembly line; however it is a very poor model if it is our desire to produce minds that will imagine new products to produce on those assembly lines.

5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.

There were trends noted among different groups of student responses based on different instructors, but what these trends likely identified were differences based on comments made by the instructors prior to handing out of the prompts. Some students focused primarily on the evaluation of the instructor (which had nothing to do with the prompt), others focused on the classroom and the difficulty of the material (again nothing to do with the prompt), other focused completely on how they had changed their study skills and the costs to the social aspects of their lives (which could have been a response to the prompt the way it was written) and some answered the questions asked in relation to the materials presented in the course and its application to the world outside of school. Based on our results, it seems that instructors introduced the purpose and expectations in a variety of ways.

- In future assessments, it may be helpful for there to be more guidance to instructors to increase the consistency of communications with students about the assessment. Standardizing all comments made prior to handing out the prompts so that the students are placed into the proper “program” mode to receive and interpret the prompt. It may be beneficial for



members of the subcommittee to visit classroom personally to ensure that the explanation given to students is standardized.

- Modifying the prompt for greater clarity of the expectations and direction for the student.
- Physically separating the prompt into two distinct questions, as the most common problem was that students just did not address response to others.

Though attempts were made to calibrate the rubric, there may have been variability in scoring. There were differences between the average scores of the two committee members scoring papers (2.14 v 2.68 for reflection on self, and 1.39 v 1.49 on response to others). If we had more time available, we could each rescore the responses scored by the other member and compare results to determine if these differences are due to a lack of adequate rubric calibration. It is possible that the differences are real. While scoring the responses, we noticed that there were differences between the overall quality of responses in different sections (CRNs) of the course. When the responses were split between scoring members, there was not equal representation of all sections between the members. For future assessments, it will be important to consider improvements to the process to reduce the possibility of different scoring standards. The following improvements should be considered.

- Improved rubric calibration method.
- Each response should be scored by more than one committee member.
- Evenly splitting the responses from each section between the scoring members.

Additionally, improvements should be made to the rubric to set the benchmarks to reflect how self-reflection is being demonstrated in this student population. Using this initial group of responses to inform the design of future rubrics should produce a more meaningful rubric for our purposes.

Additional Thoughts on the Process:

I have always been a believer in doing assessments of the students as a way to increase quality of delivery in the classroom; however this exercise has really shown me the downfalls of using this type of assessment tool in conjunction with a measurement pattern that has any value tied into the result. Assessment of what students learn in a classroom has great value, but only when that value does not extend beyond what the instructor is trying to learn from the assessment.

While this misapplied, manipulated, and misleading exercise may allow accreditation teams or administrators to easily check off some box in the evaluation of outcomes for a school, a program, a course, or an instructor, it needs to be done with the full knowledge that it is driving a nail into the coffin of innovation, imagination, and free thought among our students, which are the very things that the accreditation teams and administrators of educational institutions should be seeking to promote.

Anytime high stakes (such as accreditation or funding or professional assessment) are placed on an assessment process, the very nature of measuring it and tying it to something of value begins to warp the system to make it fit the thing that gains

the greatest value. Improving classroom delivery through information gained by such a process as this can have value, but only if it is done for its own sake. As soon as that data is tied to some gain, the system of data gathering will begin to be changed to maximize that gain and as educators we should be working against this very idea. This exercise has crystallized in our thinking how incredibly easy this system would be to manipulate and that by that manipulation we would actually be working against the intellectual growth of our students. Education is not a business that it is going to be easy to determine the value added on a per unit basis. What is the value added to an Einstein or an Edison or a Hypatia or a Rumi and how does it compare to the rest of the units in the same box that was their classroom?

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## APPENDIX 1

BI 233 instructors,

The BI SAC will be assessing self-reflection in students this year. While Ed and I have agreed to take the lead, we need your assistance in gathering data. I anticipate that this will require less than 30 minutes total time on your part. Please get these in intercampus mail by **Friday, May 18<sup>th</sup>**.

Step one: Have students complete the release form (sent as a separate attachment).

Step two: Assign students the task of composing a typed response (one-page or less) to the following prompt. If you would like to encourage your students to complete the assignment, please consider assigning extra credit points (in accordance with your individual campus's policies).

"How have your academic skills, professional competence, and/or personal beliefs and behaviors changed as a result of your experience in BI 231-233 classes? How do these changes impact others?"

Step three: Collect responses and release forms.

Step four: Organize student responses and release forms into alphabetical order by last name.

Step five: Use intercampus mail to deliver responses and release forms to Sandy Neps, CA campus, JH 210.

Step six: Give yourself a pat on the back and know that you have made a contribution to help the college meet accreditation requirements.

Thank you for your time!

Sandy Neps and Ed Degrauw

## APPENDIX 2

Scoring Rubric with sample indicators.

	Reflect on Self	Response to Others
Level 0	Provides no evidence.	Provides no evidence.
Level 1	Objectively and accurately identifies personal interests, knowledge and skills needed for or gained from a course of learning experience	Consciously affirms their own values while respecting other points of view.
Level 2	Willingly examines personal beliefs, values, and behaviors within the context of the learning experience.	Is accountable for own actions and recognizes their impact on others.
Level 3	Articulates the value and meaning of the learning experience.	Demonstrates awareness of how personal behaviors align with socially responsible values.
Level 4	Uses self-appraisal to set well-defined goals, modify personal behavior and as motivation toward goal achievement.	Demonstrates ethical awareness and empathy in dealing with differences and resolving conflict.