UA Rich Mountain
Assessing Student Learning
Course Outcomes Report
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Purpose
The Course Outcomes Report supplies information each semester regarding student learning on the course level. This report must be submitted to your division chair by the last day of the semester. Data from this report will be integrated into the annual Program Outcomes Report on Student Learning.

Background
Course Name: Essential Biology Course # BIOL154

Course Outcome(s) being assessed this semester
Think of the evidence of student learning activity or project. Choose ONE outcome for this course.

Distinguish between mitosis and meiosis including their role in the life cycle.

Strategic Goals: Select the Goal(s) associated with the Course Outcomes(s) being assessed this semester.
https://services.uarichmountain.edu/intranet/staff/annualpubs/

☐Goal One: Mission Driven
☐Goal Two: Ethically Based
☐Goal Three: Providing Access to Education
☒Goal Four: Quality Learning Environments
☒Goal Five: Student Success
☐Goal Six: Educational Partnerships
☐Goal Seven: Resource Development

Related Program Outcome: Students will apply technological and research skills to identify, locate, and process information.

Related GELO category: Research

Evidence of Student Learning
Describe the classroom activity/tools related to **course** objective (What did they do for the class which was tied to this objective? Was it a project? Discussion? Quiz?)

Describe Activity: It was a project and a part of formal lab activity to understand report for the mid-term. In this project, students prepare the tip of a root of an onion to observe the different stages of mitosis during plant cell division by following standard protocol. In lab activity, students should also observe commercially prepared permanent slides of Whitefish blastula and green onion root tips for better understanding the differences between animal and plant cell division. In addition, student collect flowers from campus greenhouse to learn the formation of male and female gamates and their fertilization process. I believe that observation of the somatic cell division on onion root tips to understand mitisois; and observation of reproductive parts and male and female gametes formation in flowers during meiosis helps students to understand differences between mitosis and meisosis. In current project, students focus more on mitosis and its role on mutation rather than a more compleicated process of cell division, meiosis. Moreover, they collect original research and review articles and web based search to interprete their data to explain the importance of mitosis during growth and development and its significance in "apoptosis",a process where old cells are replaced by newly formed cells during mitosis, and "cancer" a challenging chronic disease. Current lab activities and literature search help students to prepare their report in the format of mini riview article to understanf the significance of mitosis that explain how cancer cells develop due to faliur of mitosis cell division. Also, students significantly improve their way of criticall thinking on the critical role of apoptosis and its significance in the control of cancer development when mitosis fails. This would help students to expend horizon of their knowledge in the area of regulatory mechanism of apoptosis and uncontrol growth of cancer that how a single mistake as a mutation during mitosis can be lethal. Students also develop their skill to write mini-review professionally.

Reflection

A. What was the result of this activity? (How do you know that students satisfied the course objective being measured?)

I believe that with the minimum supervision, students were able to make their hypothesis. To prove their hypothesis, they successfully conduct some experiment and collect required materials to write the formal report. As the evidence of the output of course, over 90 percentage of the students were able to make significant improvement on making hypothesis, observing sample and creating problems, following procedure, collecting, analyzing and implementing data to write their technical report.
No surprise that initially, students usually struggle to make a suitable hypothesis, critical thinking and create scientific problem, follow the protocol and finding related references, but gradually, step-by- step they significantly improved on it. Interestingly, this project hep students to make a good collaboration, scientific discussion in a gropup or in peer level. So far collaborative attitude is a key factor to do better science. Therefore, I strongly believe that students will be highly competitive with their peer in the area of research and active learning. I make it sure that students clearly understood what they need to do and which references need to be cited. I believe that all students who challenged this project, performed very nice. Some students who did attempt this activity, could not do well in final exam either. I believe that all of the students who performed this project have above 90% on their project work.Significant progress they made on the mid-tem and final exam due to writing this as a formal lab report on mitosis and its significance in the control of cancer and regulatory mechanism of apoptosis.

B. Enter course data
Number of students in your course(s) who met course objectives: 48

Enter the number of students total in your course section(s): 51

Enter the percent (%) of students achieving this course objective. (Data will be used on Program Outcomes Report under Evidence of Student Learning.) 91%

C. Response to data: Will you change how you teach as a result of this assessment?

Choose only one of the narration options below. If curricular changes are needed, briefly explain any changes planned for course improvement. If no changes are needed, indicate the rationale in the space provided below.

☐Changes(s) needed. *Type here*

☒No change(s) needed

****Attach anonymous student samples of each activity along with the grading rubric / scale.**