

2020 – 21 & 2021 - 22 General Education Executive Summary

Department: Natural & Computer Sciences **Date:** May 19, 2021

Members involved with analysis of artifacts: Robert Hermann, John Jurchen, Kristy Jurchen, Marcus Gubanyi, Kent Einspahr, Dennis Brink, Kregg Einspahr, Jen Freund.

See General Education Assessment Plan for:

a) Learning Outcome; b) Background; c) Question(s); d) Methodology

Analysis of artifacts:

1). **PERFORMANCE CRITERIA*** - *How was data analyzed? (attach rubrics/scoring tools if used).*

Artifacts were analyzed according to the attached rubric. Rubrics were sent to the faculty beforehand for review, and the departmental faculty met together and scored the artifacts through discussion and consensus.

Summary of RESULTS*:

1). *Restate the assessment question(s) (from the Assessment plan):*

Can students demonstrate an appropriate level of knowledge of important facts, concepts, or processes in the scientific area. Specifically, do students know basic facts, concepts, and processes at a sufficient level to correctly describe them?

2). *Summarize the assessment results. A narrative summary is required. Charts, tables or graphs are encouraged but optional.*

Overall 35 artifacts were assessed, 10 from Chem 109, 10 from CS 131, 7 from Ag 102, and 10 from Phys/Sci 331 (Bio 207 was planned to contribute artifacts but was unable to do so). Of the artifacts assessed, 26 out of the 35 (74%) achieved a score of 3 or higher (on a 5-point Leikert scale). It is unlikely that the department would have achieved its goal of 80% of students scoring at least a 3 had Bio 207 been able to contribute artifacts; if it had contributed 10 artifacts, all 10 of them would have needed to be successful in order to bring the overall department score up to an aggregate 80%. Looking at the classes individually, Ag 102 (86%) and Phys/Sci 331 (80%) met the criterion for success, while Chem 109 (50%) and CS 131 (70%) did not.

3). **INTERPRETATION*** - *Discuss how the results answer the assessment question(s).*

Overall the department failed to achieve its goal of 80% of students being able to give correct answers to knowledge questions. This is despite the fact that the questions asked were generally ones that had been emphasized and covered carefully in class. The department has no concrete data as to why our students were unable to answer these types of questions, but that did not stop us from speculating! One suggestion was that while we prepare students to be able to answer knowledge questions on exams by asking similar questions on homework assignments, when they are outside of a test environment students have such easy access to "knowledge" type information on the internet that they routinely Google all knowledge questions rather than reading the book or notes for this information. Since knowledge is so easily accessible, students have no reason to take the effort to memorize (or learn) the information. In the past it was easier to learn facts than to have to continually look them up (and the act of continually looking them up helped to learn them); today information is so accessible that there is no cost to looking up information. The only time students are asked to have "knowledge" in their memory is on a test, and so they are unprepared for it. Another speculation is that in an effort to get an "authentic" assessment of student ability in science classes, instructors are much more likely to ask questions that require in-depth analysis and synthesis (plus a little knowledge along the way), and then grade the questions on a scale that reflects how much scientific thought overall the student demonstrated. This means that a student who knows very few facts but understands ideas can still do fairly well, even though they may get answers partly wrong due to not knowing all the specific facts. So instructors may not be requiring a sufficient base of knowledge in order to pass a class.

4). *Observations made that were not directly related to the question(s). (i.e. interrater reliability of the scoring tool was low)* In this assessment more than most, we were unable to come to a clear consensus on the reasons for our inability to achieve success.

Sharing of Results: *When were results shared? Date:* May 20, 2021

How were the results shared? (i.e. met as a department) Met as a department and shared via email.

Who were results shared with? (List names): Robert Hermann, Brent Royuk, Kristy Jurchen, John Jurchen, Kregg Einspahr, Tim Huntington, Connie Callahan, Kyle Johnson, Jen Freund, Kent Einspahr, Marcus Gubanyi, Dennis Brink.

Discussion of Results –Summarize your conclusions including:

1. **ACTION***- *How will what the department learned from the assessment impact:*

a. *Teaching*: Instructors will emphasize in their classes the need for students to learn (and memorize) important facts and knowledge as a part of their education.

b. *Assignment/course*: Instructors will practice assessing factual material more on in-class tests and quizzes, and give students opportunity to practice through more questions about facts in in-class discussion.

c. *Program*: We will consider the extent to which we emphasize and value knowledge versus other areas like analysis and problem-solving.

d. *Assessment*: We will plan to do a better job ensuring that all courses that expect to submit artifacts actually do so. We will also make sure that we collect artifacts that assess knowledge that was actually central to the course and emphasized that it will be asked.

2. **IMPACT***- *What is the anticipated impact of the ACTION* on student achievement of the learning outcome in the next academic year?* We hope that these actions will improve students' ability to correctly present knowledge important to the area, and that we will assess artifacts that reflect knowledge central to the course.

3. **BUDGET IMPLICATIONS** – *Indicate budget requirements necessary for the successful implementation of the ACTION** (i.e. an additional staff person, new equipment, additional sections of a course).
None

If action is taken – it is recommended that the same learning outcome and assessment plan be used for a second assessment cycle.

What assessment questions related to the learning outcome would the program like to investigate in the future? The same question as this year.

Submitted by:Robert Hermann **Assessment Committee Reviewed:** 7/6/2021

Department Chair notified – approval/additional action needed:Approved 7/6/2021

BUDGET IMPLICATIONS – Assessment Committee Chair notified appropriate Dean: na