

Institutional Student Learning
Outcome (ISLO)
Assessment Summary Report
Academic Year: 2017 – 2018
ISLO#3: Scientific Reasoning

Scientific Reasoning

Students will apply the scientific method, develop hypotheses, analyze results and draw conclusions.

Report prepared by Faculty Assessment Leader Leah M. Akins, Ph.D. and Associate Dean of Academic Affairs Susan L. Rogers, Ph.D., in consultation with participating faculty.

Report submitted on October 1, 2018

EXECUTIVE SUMMARY

Institutional Student Learning Outcome 3: Scientific Reasoning

Students will apply the scientific method, develop hypotheses, analyze results and draw conclusions

SCOPE OF 2017 – 2018 ASSESSMENT:

Courses from which Assessment Data is Gathered (# of lab sections): AST131(4), AST132(1), BIO103(13), BIO104(2), BIO105(11), BIO106(5), BIO115(2), BIO132(4), CHE121(6), MLT106(1), PHS111(2), PHY151(2)

Participating Faculty and Academic Department:

- AHBS: Bruse, Burke, Condon, Dhanabala, Espinosa, Fraley, Ingham, Justin, Kirker, Lake, Markert, Scala, Titus
- PHS: Campagne, Cavalieri, Geer, Jadhav, Langton, Lathrop, Zito

Number of sections (lab): 53

Number of students: 801

RESULTS AND RECOMMENDATIONS:

Result	Recommendation
DCC students currently exhibit college-level scientific reasoning skills at a modest level (approximately 60%) with weakest student achievement observed in the category of "Draw Conclusions".	Seek ways to improve upon student performance in college-level scientific reasoning giving particular attention to strategies that help students understand how to use data to draw sound, supportable conclusions..
Various student experiences were positively correlated to improved performance such as having completed 30 or more credits and demonstrated prior success in ENG101, BHS103 and/or a science course.	Explore avenues for providing optimal student experiences to scaffold the development of scientific reasoning skills.
Various student experiences were negatively correlated to improved performance such as no developmental coursework in the same semester as assessment and section enrollment for introductory (100-level) science courses.	
Faculty observe that student performance improves with repetition, active learning, and familiarity with scientific material covered by the assignment assessed.	Consider and implement ways to expand instructional time in science courses.

Result	Recommendation
Faculty narratives indicate that students are not consistently investing the time and effort needed to meet or exceed standards.	Consider and implement ways to help students recognize the value of science in their academic development in order to encourage motivation and persistence of effort.

CONCLUSIONS:

The Assessment team suggests that DCC consider and implement ways to expand instructional time in science courses. The team also recommends that DCC explore ways to help students recognize the value of science in their academic development in order to encourage motivation and persistence of effort. Several promising avenues were suggested to address the major points of these recommendations including recitation sections, discontinuing double-sized science lecture sections, and extended lab hours. Listed below are suggested resources to support action on these recommendations. Finally, in order to aid in the continued usefulness and validity of the Assessment process, including data collection, analysis, and interpretation, the assessment team recommends that assessment planning for the next cycle include thoughtful discussion around framing high-impact research questions and maximizing interrater reliability.

Action Item	Potential Resources
Seek ways to support strategies that help students understand how to use data to draw sound, supportable conclusions	Additional student support services with particular emphasis on additional lab support
Explore avenues for providing optimal student experiences to scaffold the development of scientific reasoning skills and ways to motivate and support students in science and the value of science to their academic development	Reassigned time for faculty, perhaps through Innovative Educator project (may include working with faculty outside of science discipline, including English faculty)
Consider and implement ways to expand instructional time in science courses with recitation sections and expanded lab hours	May require hiring additional science faculty