1R2b: Table 4-Natural Sciences AS Assessment Plan, 2018

CALENDAR YEAR 2018 / ACADEMIC ASSESSMENT AND ACTION PLANNING

Student Learning Competency 1- Scientific Reasoning (Natural Science)

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Plan Item was last modified on 9/29/18, 1:11 PM
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Number: 1.**Student Learning Competency:**

Students will demonstrate Scientific Reasoning in accordance with the criteria outlined in the current institutional Scientific Reasoning Rubric.

Title:

Student Learning Competency 1- Scientific Reasoning (Natural Science)

Providing Department:

Natural Science: Biology (A.S.)

Program Processes: Strategies to Develop Students' Learning:

Natural Science undergraduate students will begin Scientific Reasoning at the beginning of the program and continue throughout the duration of the program.

Methods of Evaluating Student Performance:

A modified version of the Lawson Classroom Test of Scientific Reasoning will be administered in first year courses of the program (BIOL 1010, CHEM 1020, BIOL 2022) and in second year courses (PHYS 1110, PHYS 1310, MICR 22440) to evaluate student performance in scientific reasoning areas. The data collection will continue, as is, until the science department develops expertise in science education research, group comparison research, and cross-correlative research to dig deeper into this rich data set.

Expected Level of Learning Performance:

Students will demonstrate improved performance in each of the scientific reasoning categories when evaluating first year course summary data compared to second year course summary data. More in-depth analysis may be developed for the future.

Uploaded Documents for Plan Design:

2017 Lawson Data Combined.xlsx

Data Display with Analysis & Summary of What Program Learned:

Students starting in the program (Biol 1010, Chem 1020, Micr 2240) have scores on the Lawson at ~50-60%, which places them in the early-transitional/late-transitional phase of scientific reasoning. By the end of the program (Biol 1390, Phys 1110, Phys 1310) students have scores in the 80-90% range, which places them in the late-transitional/abstract phases of scientific reasoning. There is definitely a progression of increasing reasoning skills over the sequencing of the program.

2017 Table: Lawson Data Combined.xlsx

Course	0.82142857	BIOL1010	MICR2240	BIOL2022	BIOL1390	CHEM1020	Chem 1030	Phys1310
Term:	SP17	SP17	SP17	SP17	SP17	SP17	SP17	SP17
Initial/Final CCA Data	Final	Final	Final	Final	Final	Final	Final	Final
# of sections in average	0.82142857	0.82142857	4	3	1			
Category	Avg %Correct	Avg %Correct	Avg %Correct	Avg %Correct	Avg %Correct	Avg %Correct	Avg %Correct	Avg %Correct
Convervation Mass and Volume	63%	61%	73%	55%	88%	55%	59%	100%
Proportions Ratios	28%	29%	30%	36%	75%	48%	47%	67%
Control Variables	42%	41%	36%	54%	75%	62%	58%	81%
Probabilty	57%	66%	69%	66%	100%	84%	94%	97%
Correlational Reasoning	61%	64%	63%	60%	92%	82%	79%	89%
Inductive	64%	71%	76%	79%	100%	82%	85%	
Hypothetical	47%	54%	55%	61%	90%	40%	44%	72%
Total Avg Score	49%	52%	52%	57%	87%	**57%**	59%	84%
Total # students that took assessment	55	74	43	24	6	14	17	9

Total # enrolled in all sections	67	85	56	36	6		1400%	17	9
Response Rate	82%	87%	77%	67%	100%		100%%	100%	100%

0.619048

0.839286

Course:	BIOL1003	BIOL1003	BIOL1003	BIOL1003			0.821429
Section number:	100	500	501	300			0.821429
Term:	SP17	SP17	SP17	SP17			0.396104
Instructor Name:	Springer	Roehrs	Smith, Cara	Trujillo, Kelli			0.567857
Faculty/Adjunct:	Faculty	Faculty	Adjunct	Adjunct			14
Face-to-face/hybrid/online:	Face-to-face	Online	Online	Face-to-face			
Initial/Final CCA Data:	Final	Final	Final	Final			Final
Total # students enrolled in section:	22	17	19	9			67
Category							Avg %Correct
Convervation Mass and Volume	70%	52%	65%	61%			63%
Proportions Ratios	24%	25%	40%	25%			28%
Control Variables	43%	42%	51%	28%			42%
Probabilty	58%	54%	71%	44%			57%
Correlational Reasoning	78%	57%	75%	11%			61%
Inductive	65%	57%	75%	56%			64%
Hypothetical	54%	34%	49%	51%			47%
Total Avg Score	53%	43%	57%	41%			49%
Total # Students that took assessment	20	14	12	9			55
Total # enrolled in sections	22	17	19	9	0	0	67
Response Rate	91%	82%	63%	100%	#DIV/0!	#DIV/0!	82%

Process Changes, Program Improvements, or Adjustments to this Plan:

We lack the correlative factor to track individual scores over the course of out program. Average course scores by sub-section and overall score increase. As evidenced by 1003, Chem 1030 and Biol 2020 having data points we are using this assessment way too much. We are also included non-program majors with additional student types taking Biol 1010 and Micr 2240. We would be better off narrowing down the courses. Further revision to courses and frequency will occur following a faculty members sabbatical in spring 2019.

Uploaded Documents for Plan Results and Improvements:

There are no attachments.

Reviewer Feedback:

Program Response:

Source: LCCC Assessment Management System, Campus Labs, 2018