2021-2021 GE Annual Assessment Report

Program: General Education
Date: October 5, 2022
The GE Committee Chair: Dr. Steve Hodson

I. Response to the previous year PRC's recommendations

• **Item:** The PRC appreciates the General Education Committee's efforts to engage in meaningful conversations that resulted in a strong Justice, Reconciliation and Diversity Proposal.	Response: We are grateful for your appreciation of our efforts. Being engaged in those conversations was a meaningful experience for the entire committee. We are profoundly grateful to Dr. Steve Contakes, last year Committee's Chair, for spearheading the committee's efforts with regards to the JRD proposal.
• **Item:** The PRC recommends that General Education consider direct assessment opportunities for the next report, especially if the Justice, Reconciliation, and Diversity (JRD) Proposal moves forward.	Response: We conducted direct assessment of the Reasoning Abstractly GE area coupled with the area syllabus audit.
• **Item:** The PRC recommends that the General Education Committee envision what future assessment could look like for the JRD GE Requirement.	The assessment of the Justice, Reconciliation, and Diversity GE requirement is incorporated in our JRD proposal. We are hopeful that the revised version of the proposal will be approved this academic year.

II. Program Learning Outcome (PLO) assessment

Program Learning Outcome	The Reasoning Abstractly GE SLO was changed. The new SLO reads, *Students will be able to construct valid instances of abstract reasoning.* This SLO was unanimously approved and adopted by the instructors of courses that satisfy the Reasoning Abstractly GE requirement at the beginning of the 2021-22 academic year. The SLO simplifies and replaces an earlier three-part SLO and the corresponding rubric. As with the earlier SLO, it is understood that 'valid' and 'abstract reasoning' are to be construed in discipline-appropriate ways (e.g., in a computer science class, a program might be regarded as an instance of abstract reasoning).
Who is in Charge	Dr. David Vander Laan, GE Reasoning Abstractly Coordinator
Direct	Goal. The goal of the assessment was to assess student ability to reason abstractly in college courses that satisfy the Reasoning

Assessment Methods

Abstractly GE requirement.

Courses: Student work was assessed in seven of the Reasoning Abstractly courses taught in 2021-22. Each instructor developed the assessment tools for their courses and sent the assessment results to David Vander Laan for reporting. Those instructors and courses were:

Russ Howell	MA-004	Math in Context
Carolyn Mitten	MA-160	Fundamentals of Mathematics
Jim Taylor	RS-103	Christian Apologetics
Maryke van der Walt	MA-005	Introduction to Statistics
	MA-009	Calculus I
	MA-010	Calculus II
David Vander Laan	PHI-108	Formal Logic

Methods and tools. All student work was assessed using the rubric below. The prompts for the assessment activities in each course are appended to the report.

High Proficiency	**Proficiency**	**Some Proficiency**	**No/Limited Proficiency**
The student has constructed a clearly valid proof (or argument, model, &c).	The student has constructed a proof (or argument, model, &c) that would be valid but for a few minor errors.	The student has constructed a proof (or argument, model, &c) that would be valid but for errors that are substantial or many.	The student has not constructed a proof (or argument, model, &c).

Indirect Assessment Methods

Syllabus Review

In the Fall 2021, the General Education Committee conducted audit of the following Reasoning Abstractly course syllabi, CA-010, CA-015, MA-005, MA-009, MA-010, MA-015, MA-019, MA-160, PH-103, RS-103. The audit did not reveal any issues with the area syllabi.

Major Findings

Results and interpretation: The results of the assessment activities were as follows.

Course (# of students)	**High Proficiency**	**Proficiency**	**Some Proficiency**	**No/Limited Proficiency**
MA-004 (5)	40%	40%	20%	0%

MA-160 (9)	22.2%	44.4%	11.1%	22.2%
RS-103 (13)	57.7%	23.1%	15.4%	3.8%
MA-005 (41)	78%	22%	0%	0%
MA-009 (26)	15.4%	42.3%	42.3%	0%
MA-010 (27)	40.8%	48.1%	11.1%	0%
PHI-108 (13)	92.3%	0%	0%	7.7%
weighted average	52.6%	31.6%	13.5%	2.6%

Overall, more than half of the students tested scored "high proficiency" and 84.2% scored either "high proficiency" or "proficiency." Some instructors were surprised that students did not perform better on the assessed task, speculating, for example, that the timing of the activity in relation to spring break may have caused relatively low scores. Other instructors were surprised at how high the scores were and wondered whether all of the students worked independently.

Allowing for imperfect reliability of the results, they nonetheless suggest that students are generally able to construct instances of valid reasoning.

Conclusions and recommendations. The assessment was conducted with a new SLO and rubric. The SLO is "Students will be able to construct valid instances of abstract reasoning," and the rubric is displayed in section c above. The certification criteria remain unchanged. The instructors of Reasoning Abstractly courses who met to discuss the SLO and rubric agreed that the new rubric is helpfully simpler than the previous versions. Further, the new SLO identifies a higher-order skill that effectively includes the other skills (identifying arguments and evaluating arguments) that were explicit elements of the previous SLO. The change thus appears to provide gains in efficiency without sacrificing appropriately challenging abstract reasoning goals for our students.

The assessment results strongly suggest that Westmont students are in general able to construct instances of valid reasoning. The results do not suggest that students suffer from any noteworthy deficiency in this area and do not indicate that any extraordinary intervention is needed.

Closing the Loop Activities

Final recommendations for closing the loop activities.

It is recommended that the instructors teaching Reasoning Abstractly courses meet prior to the next Reasoning Abstractly assessment cycle to discuss whether the new SLO continues to appear suitable and to address any questions (e.g., questions about how to apply the rubric) that may arise.

Discussion

All instructors teaching the aforementioned RS courses discussed and interpret assessment results and developed recommendations in Spring 2022. The GE Committee discussed those results at their meeting on October 6, 2022.The Committee agreed with the conclusions made by RA instructors.

III. Appendices

Appendix A: Prompts for 2021-22 Reasoning Abstractly Assessment Activities

The prompts for the assessment activities summarized above were as follows:

MA-004

"Prove by contraposition: if x^2 is even, then x is even."

MA-160

"Walking at a constant speed, a person walks 3/4 of a mile every 12 minutes. Explain how to reason about a double number line to answer the following questions:
a. How far does the person walk in 36 minutes?
b. How long does it take the person to walk 2 1/2 miles?"

RS-103

You are to write an argumentative essay of at least 1000 words that has the following features:

1. A thorough reconstruction in standard argument form (a list of numbered propositions starting with the premises and ending with the conclusion) of a critic's argument against a core Christian claim or doctrine), together with an explanation of the argument; and
2. A defense of this Christian claim or doctrine by means of a counterargument providing reasons to doubt or deny a premise of the critic's argument (in standard prose form rather than standard argument form).

Your reconstruction and counter-argument must be in your own words as much as possible (i.e., don't just employ my (or someone else's) formulation of the arguments).

MA-005

"Suppose you are testing the hypothesis H0 : □ = 0.50 and Ha : □ > 0.50. You get a sample proportion 0.54 and find that your p-value is 0.08. Now suppose you redid your study with each of the following changes. Will your new p-value be larger or smaller than the 0.08 you first obtained?
(a) You increase the sample size and still find a sample proportion of 0.54.
(b) Keeping the sample size the same you take a new sample and find a sample proportion of 0.55.
(c) With your original sample, you decide to test a two-sided alternative hypothesis."

MA-009

"Find the following limits, indicating clearly where you use L'Hospital's rule.

(a) $\lim_{x\to 0} \frac{\sin(5x)}{\tan(9x)}$

(b) $\lim_{x\to \infty} \frac{e^x}{x^2}$

(c) $\lim_{x\to \infty} \frac{\ln(1+ e^x)}{x}$,,

MA-010

"Determine whether the following infinite series converge or diverge. In each case, also state the test you are using to make your decision. Show all your work.

(a) $\sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{2n-1}}$

(b) $\sum_{k=1}^{\infty} 4^k 3^{1-2k}$

(c) $\sum_{k=2}^{\infty} \frac{4k^2}{5-2k-3k^2}$,,

PHI-108

1. Read Peter van Inwagen's "A formal approach to the problem of free will and determinism."

2. Notice how van Inwagen's formal statements would be expressed in the formal language used in *The Power of Logic*.

Scheme of abbreviation

Nxy	x is nomologically congruent to y
Sxy	x shares a slice with y
Hxy	x has access to y
A	the actual world
Dx	(∃y)(Nyx) • (y)[(Nyx • Syx) → y=x]; x is deterministic; i.e., something is nomologically congruent to x, and everything that both is nomologically congruent to x and shares a slice with x is identical to x

The relevant propositions

(∃y)(Nya) • (y)[(Nya • Sya) → y=a]

This is what 'Da' abbreviates. It is the claim that the actual world is deterministic, i.e., that determinism is true.

(x)(y)(Hxy → Nya)

Metaphysical assumption A: All worlds to which anyone has access have the same laws as the actual world. The laws of nature are not up to us.

(x)(y)(Hxy → Sya)

Metaphysical assumption B: All worlds to which anyone has access share a slice with the actual world. In particular, if we think that we can't act in such a way that the past is different from what it actually was, then we will conclude that each world to which we have access shares many *past* slices with the actual world.

(∃x)(∃y)(Hxy • y≠a)

The minimal free-will thesis: Something has access to some world other than the actual world.

3. Peter van Inwagen claims that determinism is incompatible with the minimal free-will thesis given metaphysical assumptions A and B. Show that this is correct by giving a formal proof of the argument below.

1. (∃y)(Nya) • (y)[(Nya • Sya) → y=a]
2. (x)(y)(Hxy → Nya)
3. (x)(y)(Hxy → Sya) ∴~(∃x)(∃y)(Hxy • y≠a)

Appendix B. Reasoning Abstractly rubric

Student Learning Outcome: Students will be able to construct valid instances of abstract reasoning.

High Proficiency	**Proficiency**	**Some Proficiency**	**No/Limited Proficiency**
The student has constructed a clearly valid proof (or argument, model, &c).	The student has constructed a proof (or argument, model, &c) that would be valid but for a few minor errors.	The student has constructed a proof (or argument, model, &c) that would be valid but for errors that are substantial or many.	The student has not constructed a proof (or argument, model, &c).