Cognitive Assessment Redesign: Designing Critical Thinking
PSYC 100 Labs

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CAR Project Goals

1. Support faculty to develop course-based assessments
2. Investigate the reliability of course-based assessments
3. Report the value-add between first and fourth year cognitive skills achievement across the institution
4. Develop an institutional guide

Designed by Natalie Simper, Emily Hearns and Jenny Ge
1st and 4th year student sample completes the HEıghten test.

1st and 4th year "authentic" assignments developed and marked by course instructors/teaching assistants using specific criteria.

Course assignments are aligned with standardized VALUE rubrics (generic criteria).

Correlation/Validation

Designed by Natalie Simper, Emily Hearns and Jenny Ge
**Critical Thinking**
- Explains issue or problem, provides relevant information necessary for understanding.
- Selects and uses information information to investigate a point of view or conclusion.
- Adopts a specific position in arguments.
- Analyzes own and others' assumptions and evaluates the relevance of contexts.
- Evaluates consequences and implications of conclusions.

**Problem Solving**
- Constructs a contextual problem statement.
- Identifies contextual approaches and strategies.
- Proposes relevant and contextually appropriate situations.
- Evaluates potential solutions incorporating diverse factors.
- Implements solution in a contextually appropriate manner.
- Evaluates solution, addressing shortcomings and identifies limitations and future work.

**Creative Thinking**
- Acquires strategies and skills within a particular domain.
- Seeks out and follows through on untested, risky approaches to the task.
- Develops a logical consistent plan and recognizes consequences of the solution.
- Integrates alternate, divergent, or contradictory perspectives or ideas and extends ideas to create new knowledge.
- Transforms ideas or solutions into new forms.

Designed by Natalie Simper, Emily Hearn and Jenny Ge
Network Hub

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Designing a Critical Thinking Lab
Story 1

This story is about a general trying to overtake a fortress ruled by a dictator. There are many roads that lead to the fortress and the general wanted to send his massive army down one of the roads to overtake the fortress. At a pivotal moment he learns that there are mines on the road that will go off if a large group, like an army, pass over them. However, the mines won’t go off if smaller groups pass over them since they are still roads that workers and farmers use. Undeterred, the general decides to split up his forces so that smaller groups go down different roads but end up converging en masse at the fortress.

▪ based on work from Mary Gick and Keith Holyoak
Story 2

Pretend that you are a doctor faced with a patient who has a malignant tumor in his stomach. You cannot operate on the patient and remove the tumor, but the tumor is going to kill the patient unless it is destroyed. You know that a high intensity ray will destroy the tumor, but at that intensity it will also kill healthy tissue, which will kill the patient. At a lower intensity that is safe for the healthy tissue, it won’t destroy the tumor, which will kill the patient. How can you use the rays to destroy the tumor without destroying the healthy tissue?”

- based on work from Mary Gick and Keith Holyoak
Only 20% of students who attempted to solve the problem gave the correct answer without being prompted to use the initial story.
Our Goal

• To employ the use of **multiple** examples to help encourage **differentiation** between **surface and deep levels** of an example

• To give students **repeated practice** with **critical thinking tasks** that we know our PSYC100s struggle with based on previous research
Data Collection

Time 1
- Completed individually as lab prep work
- Opportunity to work as team
- Feedback given

Time 2
- Completed as a group
- Similar deep structural considerations, different surface level details
- Feedback given

Time 3
- Completed as a group
- Similar deep structural considerations, different surface level details
- Did not receive feedback before submission
Data Analysis

• Coding is currently beginning

• TA feedback on the delivery of the content was measured as part of our standard operating procedure
How would you rate the difficulty of this lab?
Should this lab be kept as is, revised, or replaced?

Suggestions for revisions

- Rewording the prep work question such as "does this provide STRONG evidence" rather than simply "does this provide evidence (this is ambiguous as there is evidence here but it may not be valid or strong).
- Potentially make a bit longer?
- Perhaps make it a bit challenging.
• Promote evidence-based teaching practices

• Creates a larger discussion about nature of assessment practices

• Develops a network of instructors

*For more information about the project, visit [http://www.queensu.ca/qloa/home](http://www.queensu.ca/qloa/home)*