

NWCCU Assessment Demonstration Project *at Columbia Basin College*



"Theory-based, data-informed, learning-focused"



NWCCU Assessment Demonstration Project
Summit, Oct 9, 2017

Who We Are

Columbia Basin College (CBC) is a mid-sized, public, primarily two-year Washington State community college located in Pasco and Richland (Tri-Cities Area) in Eastern Washington.

CBC has over 5,900 students (FTE), the majority of which are AA degree-seeking students, with a substantial Professional/Technical enrollment, Transitional Studies offerings, and a growing BAS enrollment. We are an Hispanic Serving Institution (HSI) with a growing Hispanic population, in a service area that is experiencing population growth, within an historically traditional, agricultural community.



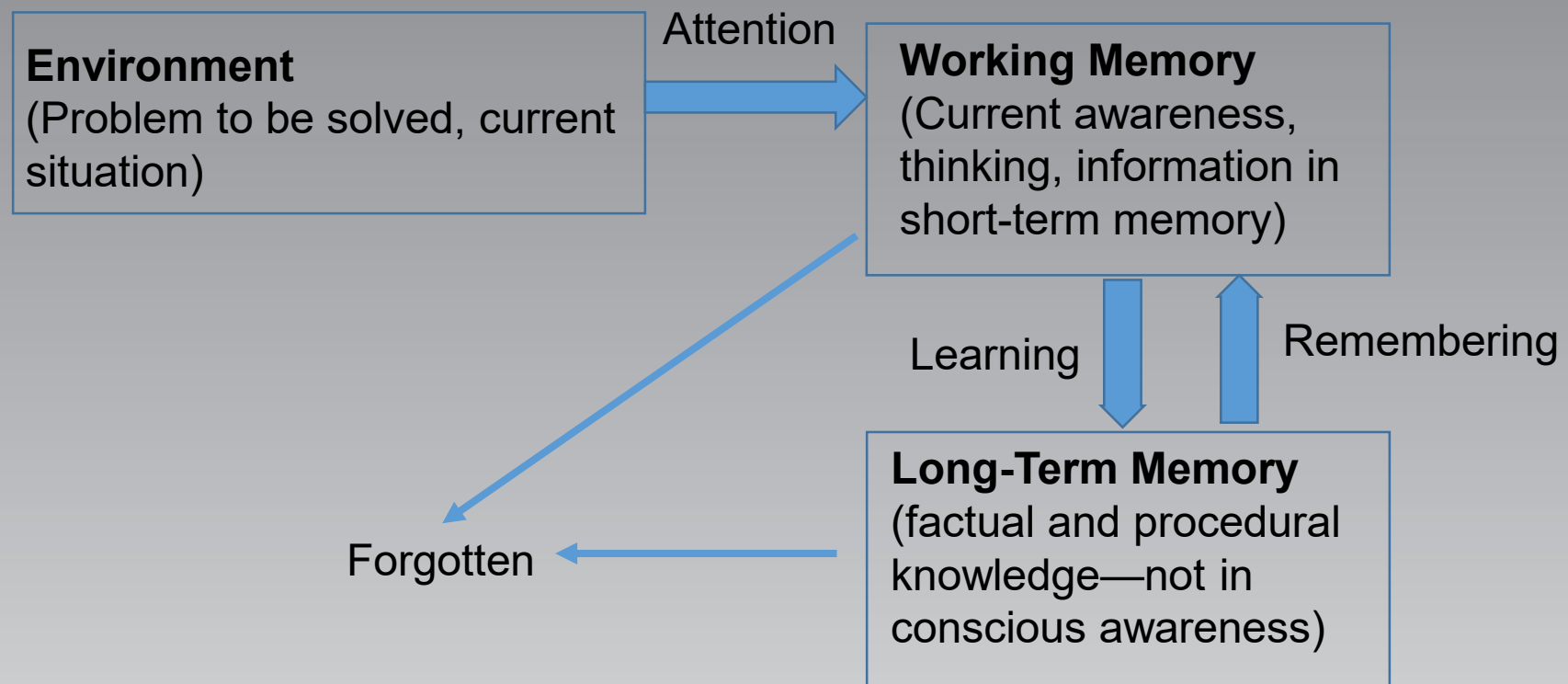
Goals: Demonstration Project

- A. Assess performance on a set of CBC Student Learning Outcomes (SLOs), focusing primarily on Critical Thinking, to determine the degree to which critical thinking skills improve as a result of completing academic coursework at CBC.
- B. Expand CBC's pool of direct indicators of learning, including Critical Thinking, Quantitative Reasoning, and Written Communications
- C. Incorporate newly-developed direct measures of student learning into the assessment of Core Themes and Mission Fulfillment
- D. Use the results of new learning assessments to improve student support processes, guide faculty professional development activities, improve pedagogy practices, and re-configure organizational structure and processes.
- E. Create a structure and process for incorporating additional measures of SLO performance (e.g., Cultural Effectiveness, Information Technology) into Core Theme and Mission Fulfillment assessment

What We Learned from the Literature Review

- Researchers disagree as to the best definition of critical thinking. There are two main schools: Domain-General (CT as a broad ability, applicable in many domains) and Domain-Specific (CT involves applying deep content knowledge to a specific subject matter)
- General CT ability includes: evaluating evidence, analyzing and evaluating arguments, understanding implications and consequences, producing original arguments, and understanding causation
- Domain-Specific research builds on strong theoretical and empirical bases, including Ericsson's extensive work on "expert thinking" (e.g, at least 10,000 hours of intensive effort are needed to achieve mastery level expertise).
- Cognitive psychologists (e.g., Willingham, 2009) emphasize the importance of content knowledge (from Long-Term Memory) as the basis for CT, given severe limitations to Working Memory (consciousness). CT involves accessing relevant information and problem-solving approaches from Long-Term Memory and applying them to current situations.
- Learning involves creating new neuronal connections, expanding neural areas, and neurogenesis. Hence, cognitive ability increases during learning.

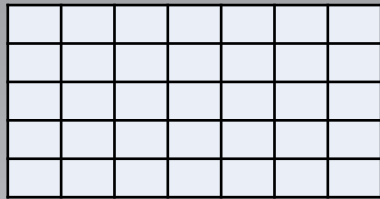
Role of Long-Term Memory in Critical Thinking



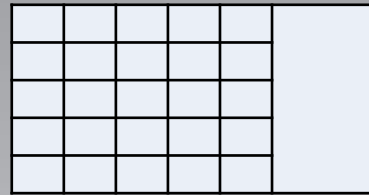
- Because of limitation in storage capacity and slow processing time in Working Memory, information stored in Long-Term memory is quickly and efficiently accessed when needed for critical thinking
- Actual critical thinking occurs in Working Memory, but is very limited
- Critical thinking in Working Memory is very demanding of energy.
- Hard-wired energy conservation processes work counter to engaging in such higher-level thinking

Domain-General Critical Thinking

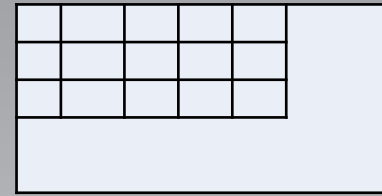
The first four figures below change in a systematic manner according to some rule. Your task is to discover the rule and choose from among the four Alternatives the figure which should occur next in the series.



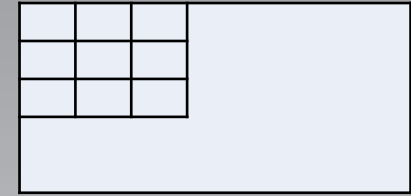
1



2

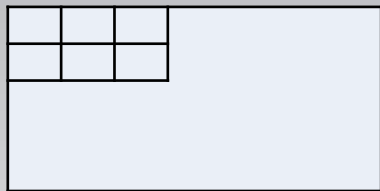


3

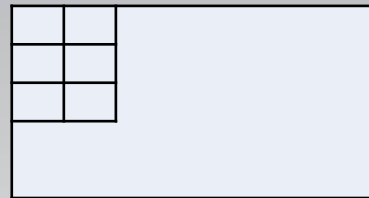


4

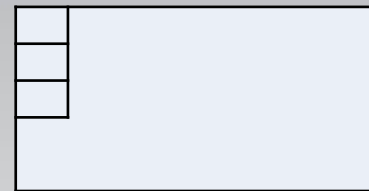
Alternatives



A



B



C



D

Other examples:

Deciding who to vote for

Choosing a new car

Evaluating the ethical value of a new national healthcare plan

Choosing a college major

Characteristics of Good Versus Poor Critical Thinkers

Poor critical thinkers

- One-shot thinking
- Indifference to gaining a thorough understanding of the situation
- Mentally careless and superficial in solving problems
- Spend little time on the problem
- Passive in thinking, choosing an answer based on intuition, feelings
- Rush through the analysis
- Don't seek objectivity; allow subject opinions to intrude
- Place little value on reasoning, analysis
- Do not see a problem as amenable to analysis

Good critical thinkers

- Carefully read and understand the instructions or situation
- Create an initial definition of the problem
- Create hypotheses to test
- Employ a lengthy, sequential analysis to solve the problem
- Draw on other information in their possession to clarify the problem
- Carefully proceed through a series of analysis steps
- Break problems into sub-problems, if necessary, and perform these analyses
- Evaluate their own thinking, looking for errors in reasoning

- Multiple research studies have shown that poor critical thinkers can be taught to be good critical thinkers
- The most effective approach involves 1-on-1 mentoring, with students verbally describing their thinking processes and receiving feedback from the mentor
- Students completing such training show significantly improved academic performance and increased college grades

(from Whimbey and Whimbey, 1971)

Hierarchy of Interventions to Improve Critical Thinking

1-on-1 mentoring



Mentoring in groups



Explicit, stand-alone coursework plus explicit training in CT within disciplines



Explicit CT training within disciplines



Stand-alone CT coursework



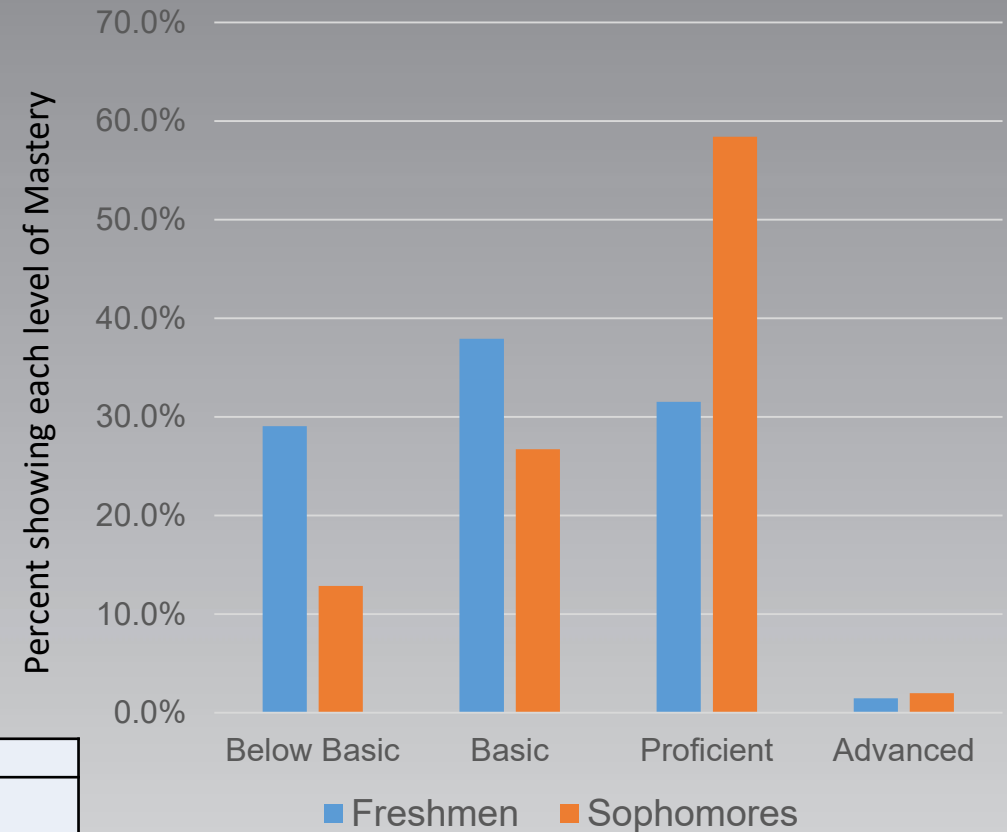
Implicit (immersion) training in CT



Coursework focused on content

Critical Concept 1: Proficiency Increased with Credit Attainment

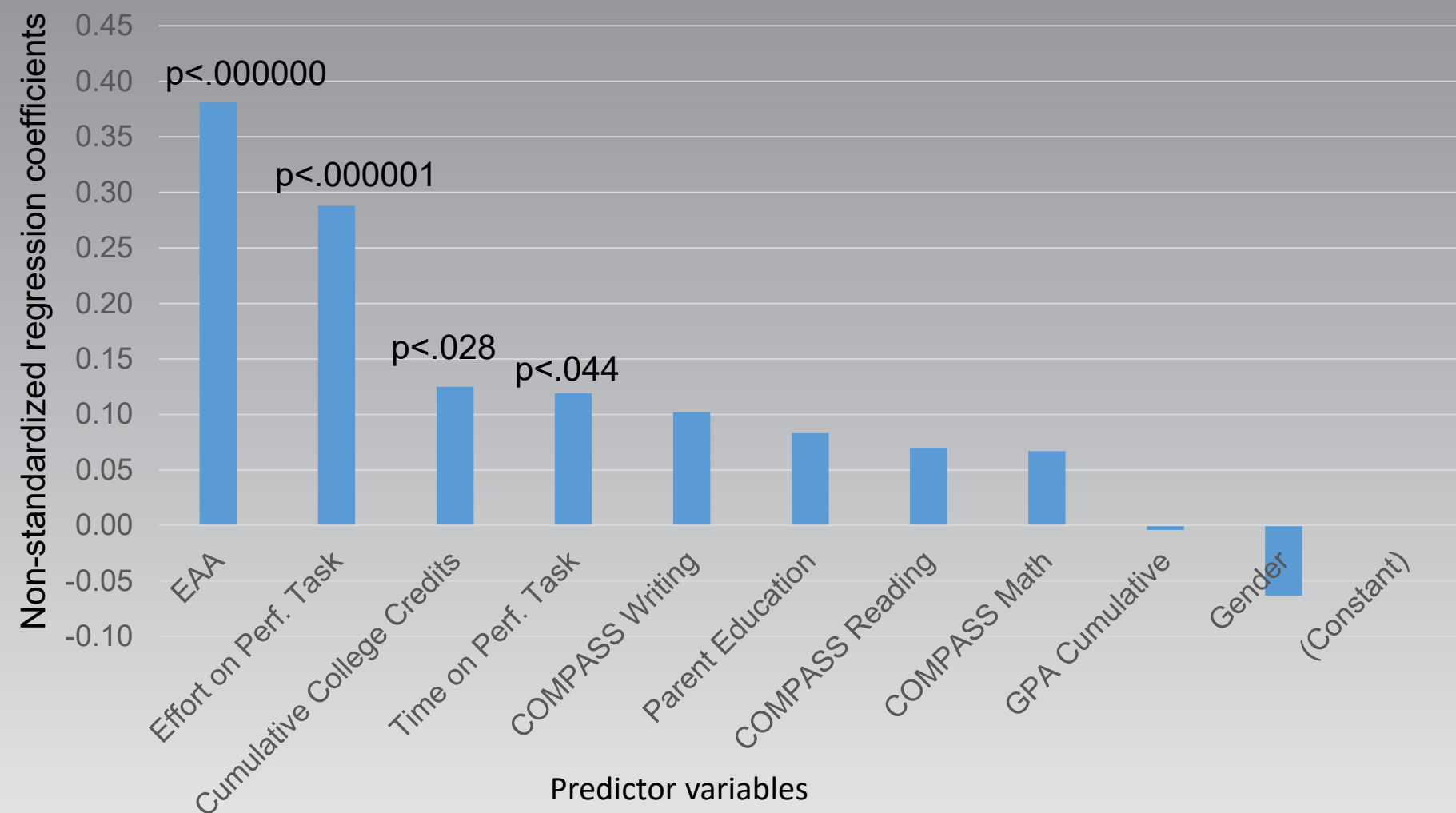
Mastery Level		Freshmen	Sophomores
Below Basic	Count	59	13
	Column Pct	29.1%	12.9%
Basic	Count	77	27
	Column Pct	37.9%	26.7%
Proficient	Count	64	59
	Column Pct	31.5%	58.4%
Advanced	Count	3	2
	Column Pct	1.5%	2.0%
Total	Count	203	101
	Column Pct	100.0%	100.0%



Freshmen			Sophomores				
N	Mean Mastery Score	Std. Dev.	N	Mean Mastery Score	Std. Dev.	F	p-value
203	2.05	.816	101	2.50	.743	20.874	.000007

- Sophomores showed a significantly higher level of Critical Thinking Mastery than did Freshmen
- Very few students attained the Advanced level of Proficiency
- CBC students performed very well compared to baccalaureate institutions

Critical Concept 2: Credits Predicted Scores in Regression Models



R	R Square	F Change	p-value
.700	.490	16.930	.000000

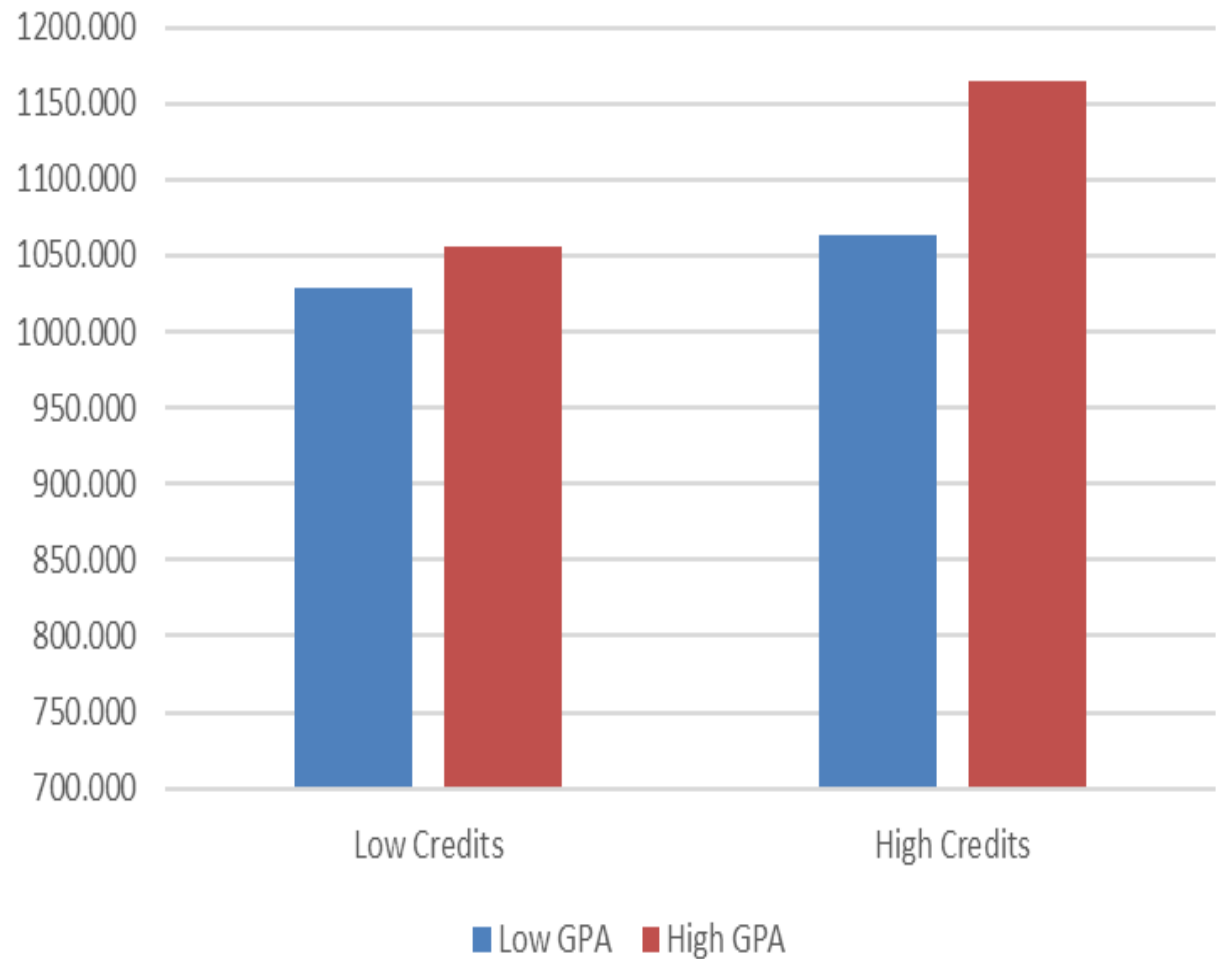
- The EAA (IQ) score was the strongest predictor of CLA+ scores
- Next best were “Effort”, Cumulative Credits, and “Time”



Critical Concept 3: Top Performers Had High Grades and Credits

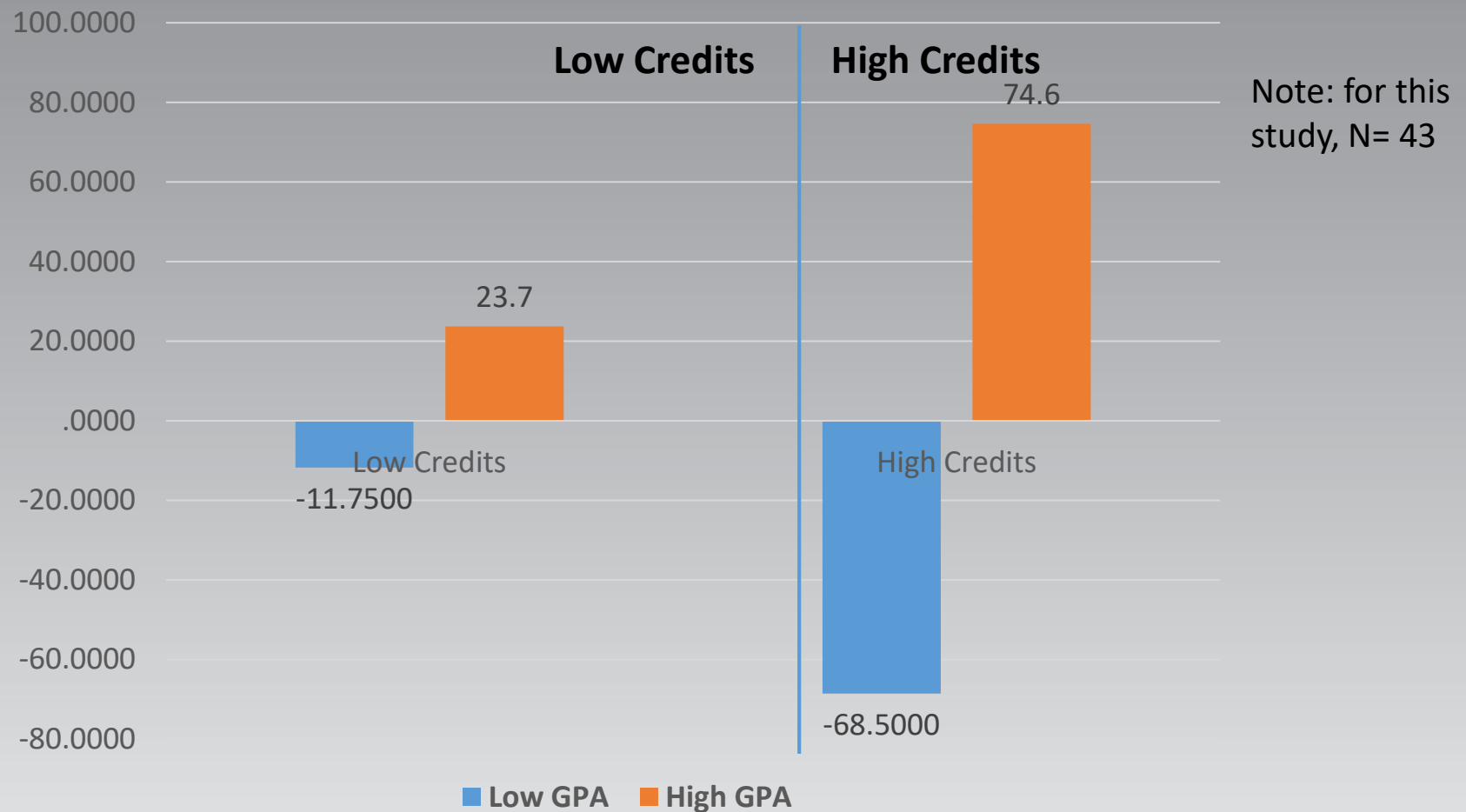
ANOVA Results: CLA+ as Dependent Var.

Source	df	F	Sig.
Corrected Model	3	13.3	.000
Intercept	1	17003.0	.0000000
High/Low GPA	1	15.1	.0001
High/Low Credits	1	19.0	.00002
GPA* Credits	1	5.2	.024
Error	272		
Total	276		



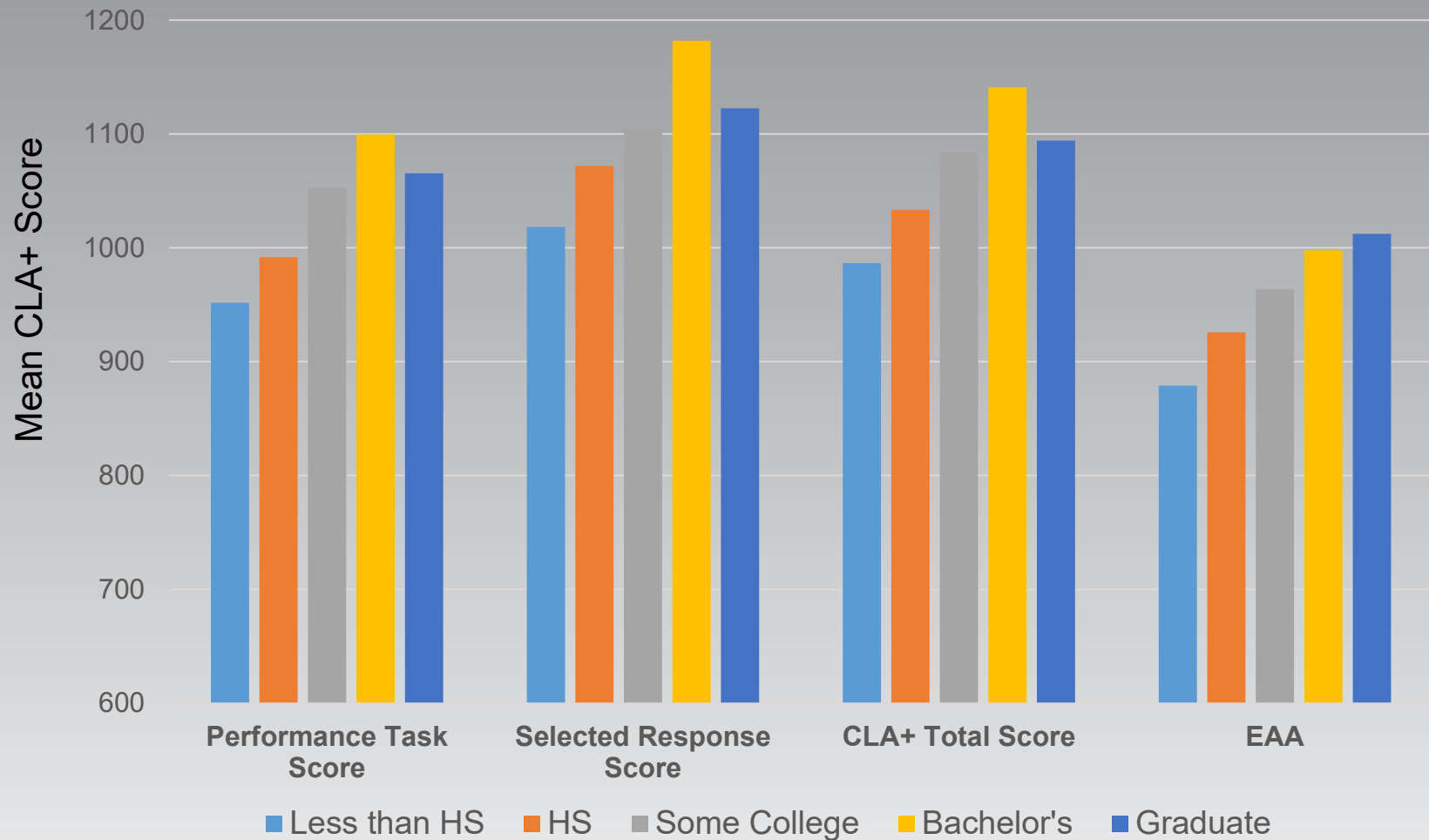
Students with high cumulative GPAs and high accumulated credits far outperformed students with similar credit levels but lower GPAs, and students with fewer credits.

Critical Concept 4: Students w/ Low Grades Showed a Decline in Scores



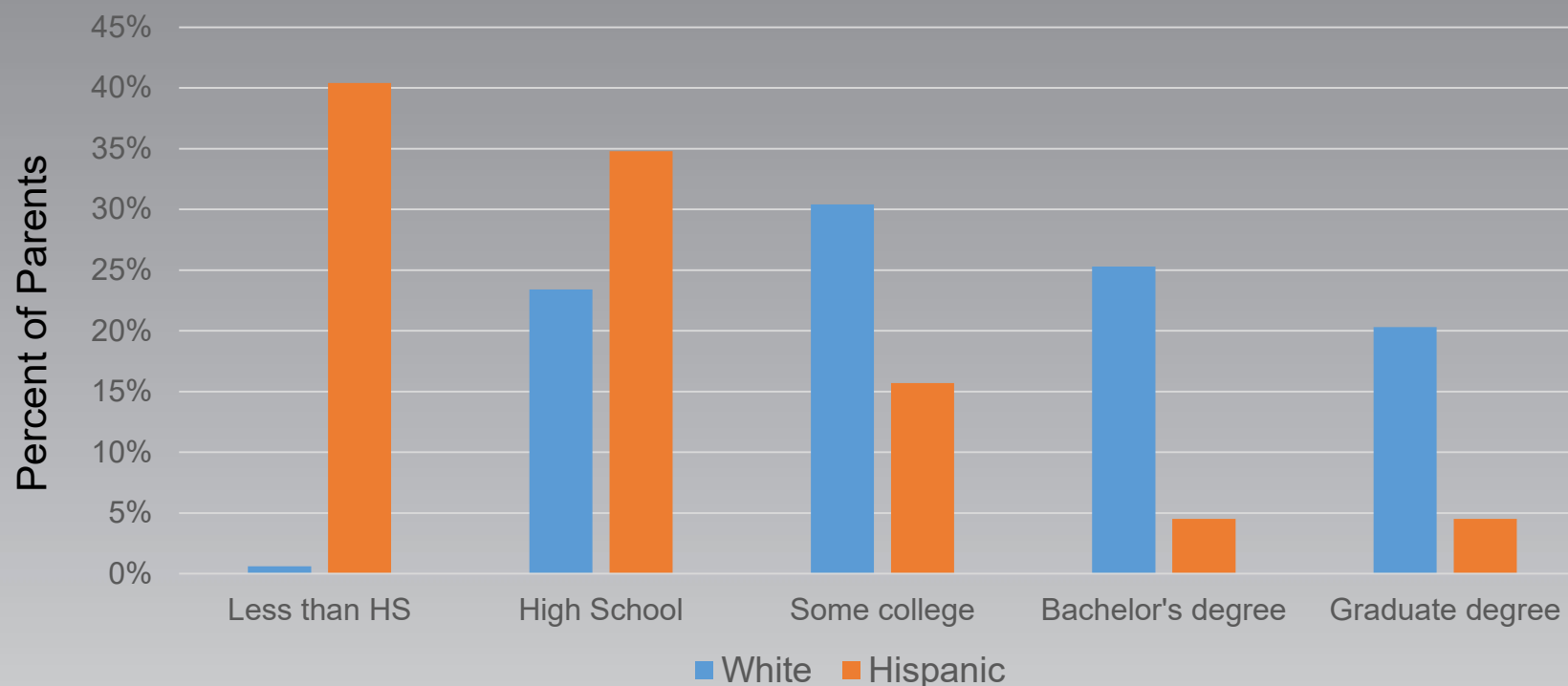
- Students with High Credits and High GPAs showed a large mean increase in CLA+ scores at Time 2. Students with Low Credits but High GPAs showed a smaller increase
- Students with High Credits but Low GPAs showed a large decline in CLA+ scores. Those with Low GPAs and Low Credits showed less of a decline

Critical Concept 5: Parent Education Level was Highly Related to Scores



Consistent with the research literature, students from higher SES families performed better on the sub-tests, CLA+ and EAA than did students from lower SES families

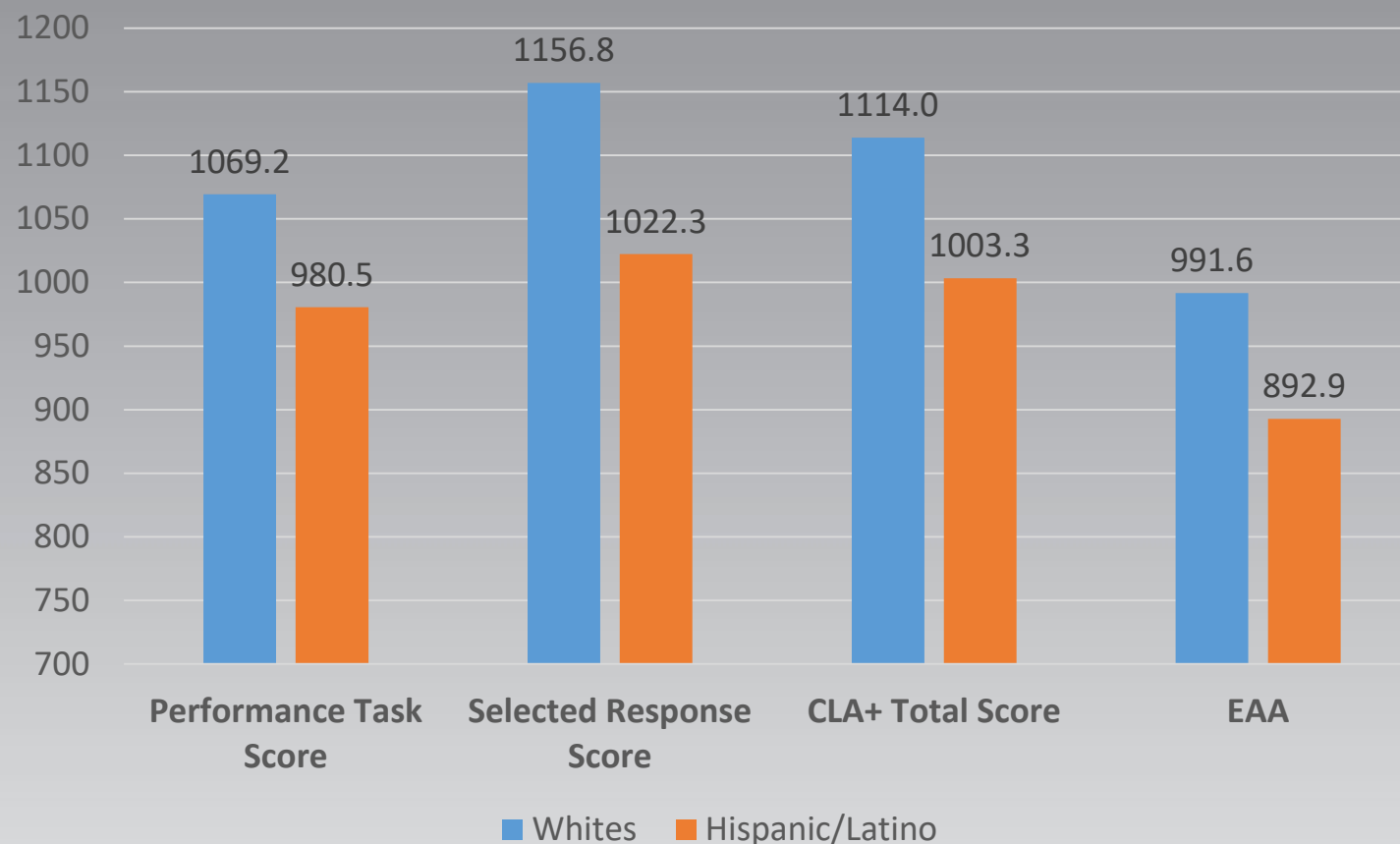
Parent Education Levels and Ethnicity



Note the stunning differences in Parent Educational Level for Whites versus Hispanics

- Hispanic Parents generally had less than a High School Diploma (40%) or a High School Diploma (35%)
- White parents generally had Some College (30%), a Bachelor's degree (25%), or a Graduate Degree (20%)
- Overall, while about 75% of Hispanic parents had a high school education or less, only about 24% of White parents had similar education levels

Mean Test Scores for Whites Versus Hispanics



Note: the Entering Educational Assessment (EAA) is a short form IQ assessment

Whites outperformed Hispanics on the sub-test scores (Performance Task and Selected Response), on the CLA+ Total, and on the EAA assessment

Post Study Additional Research Activities

1. Follow-up study focusing on Domain-Specific Critical Thinking skills, lead by Teresa Thonney (English Department). Gathered input from 23 campus Departments as to how they would define critical thinking for their discipline. Examined common themes and areas of difference among the responses by the Departments. Study submitted for publication September, 2017.
2. Additional review of the literature focusing on Socioeconomic Status and cognitive functioning. Those from lower SES families tend to display cognitive deficiencies that can impair academic performance (e.g., lower vocabulary levels, slower reading speeds, poorer planning skills, weaker long-term memory acquisition)
3. Presentation of findings through other conferences and presentations (e.g., the CLA+ study will be presented at the 2017 PNAIRP conference)
4. Initiating research into additional SLOs – starting with Information Literacy

Institutional Impacts

- Understanding the value of in-depth research and theory for insuring assessment validity and integrity
- Expanded view of mission fulfillment
- Increased focus on professional development for faculty that improves students' critical thinking skills
- Design of program review to emphasize alignment of student outcomes

College-Wide Student Learning Outcomes (SLOs)

Outcome 1: **Think Critically**

Outcome 2: **Reason Quantitatively & Symbolically**

Outcome 3: **Communicate Effectively**

Outcome 4: **Apply Information Tools and Resources**

Outcome 5: **Develop Cultural Awareness**

Outcome 6: **Master Program Learning Outcomes**

Yearly Focus

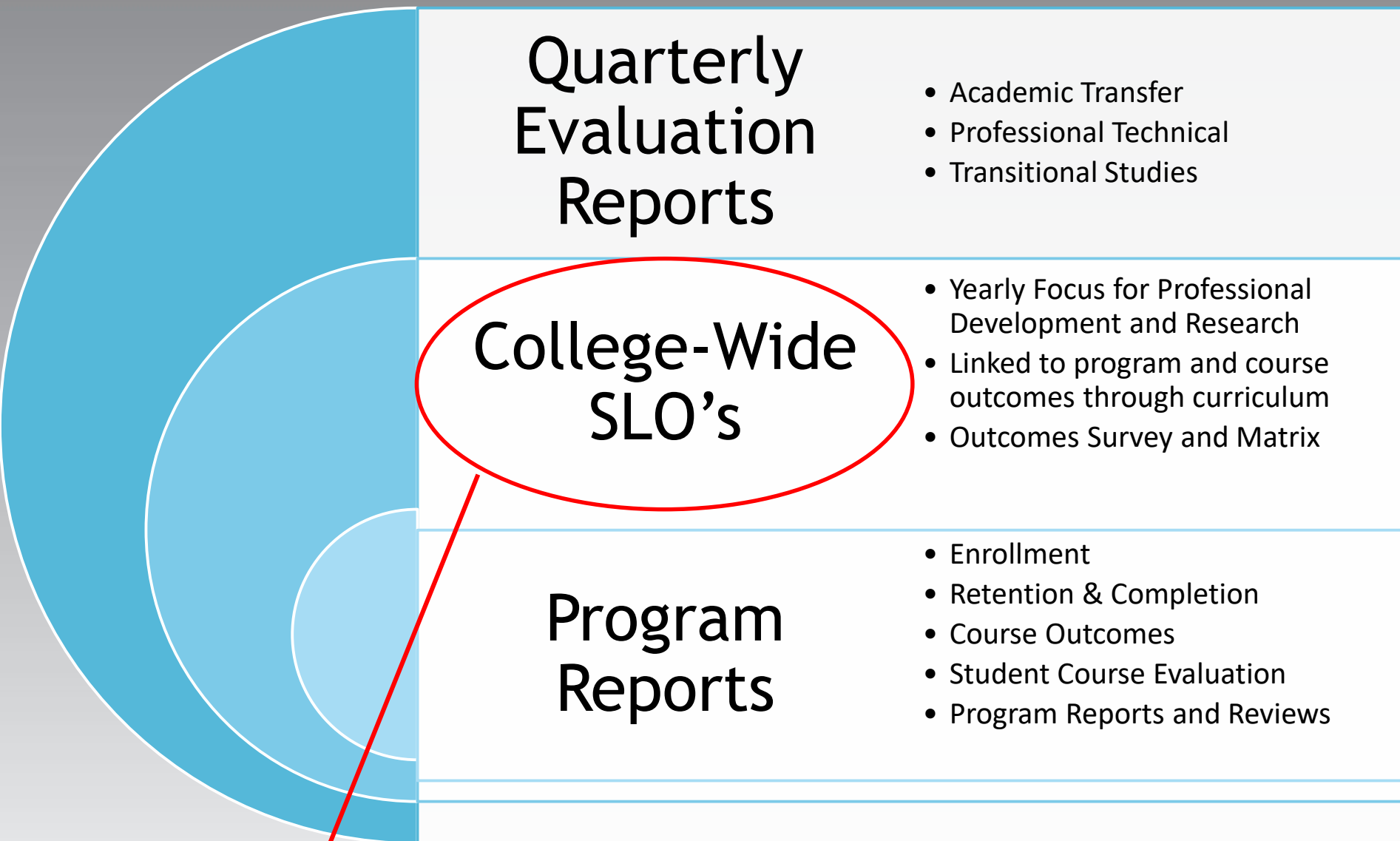
While individual course outcomes and program goals will always be linked to College-wide SLO's through curriculum development, each year the college community will focus on one outcome for raising awareness, assessment, critical reflection, and development.

2017-2018 Focus

Outcome 4: Apply Information Tools and Resources



Redefining Mission Fulfillment



- With more institutional focus on retention and completion, skill assessment has become more important in order to demonstrate consistent quality of credential



College-Wide SLO's

- Yearly focus for professional development and research
- Linked to program and course outcomes through curriculum
- Outcomes survey

Direct result of our learning through the project:

- Validated the need for performance task assessment (in addition to regular, lower cost monitoring),
- An accepted assessment requires involvement of faculty / faculty leadership,
- Assessment development would be enhanced with wider publication / opportunity for faculty guidance

Thank You

From our Demonstration Project Team:

Joe Montgomery

Monica Hansen

Jason Engle

Melissa McBurney

Accreditation Research Consultant

Dean for Social Sciences, World Languages, and Assessment

Dean for Organizational Learning

Assistant VP for Instruction

