Improving Student Learning through Scholarly Inquiry

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Presented at DePaul University
October 25, 2013

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DePaul University's Context

"*The scholarship of teaching and learning is the rigorous investigation of student learning, with the* **purpose of developing novel teaching methodologies and practices that can lead to the measurable enhancement of student learning**. *The results of the investigation are made public through scholarly outlets such as conferences and general or discipline-specific journals of general acceptance in the relevant field*."

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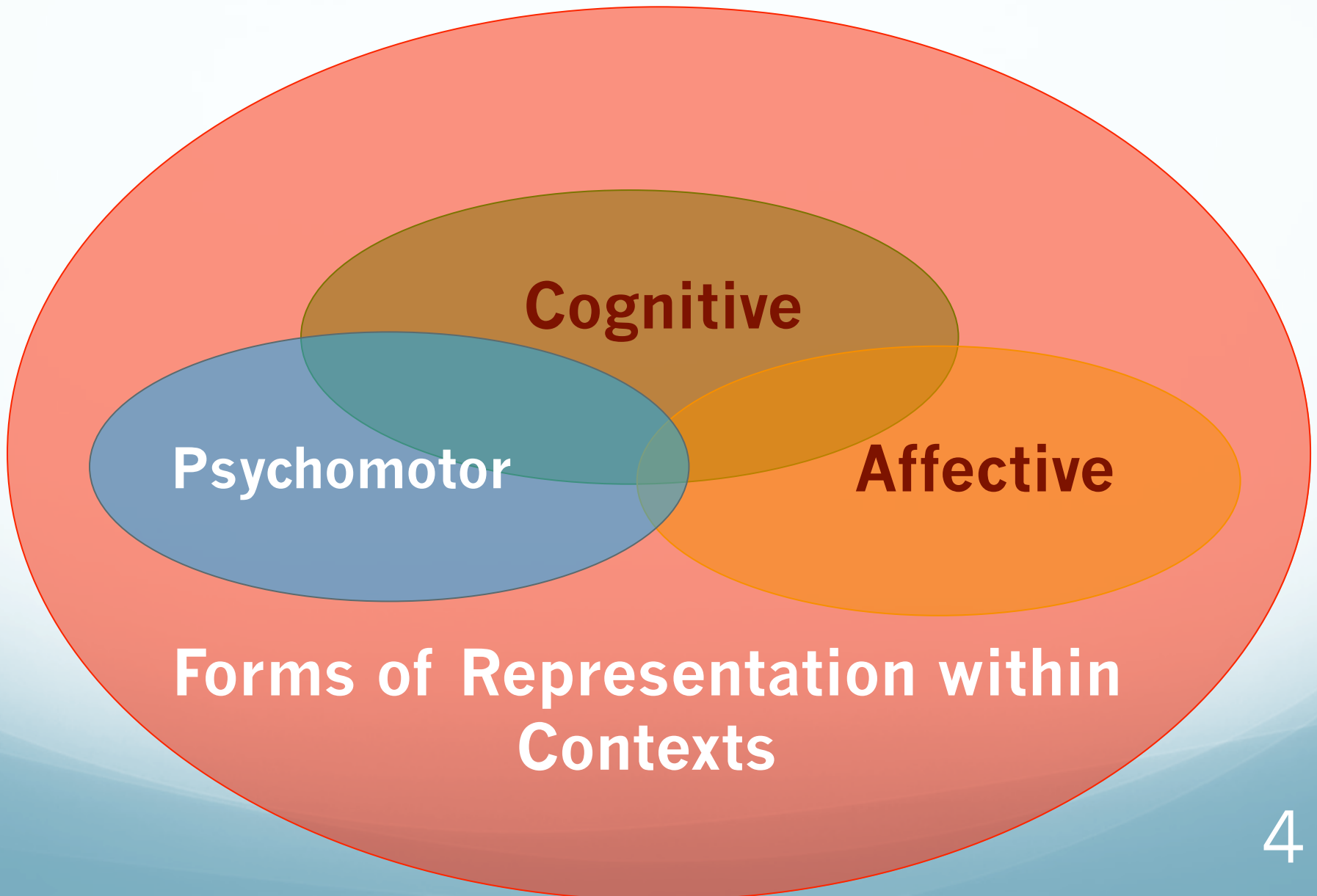
I. Why Make the Commitment?

- What You Want **All** Students to Learn
- What and How Well Learning Travels with Students
- How Research on Learning Informs Teaching and Learning

II. How Educators Have Made the Commitment

- Case Studies

III. How You Can Make the Commitment

I. Why Make the Commitment: What You Want **All** Students to Learn

# What and How Well Learning Travels with Students

How well do your students…

- Integrate

- Transfer

- Analyze

- Apply or re-apply

- Re-use

- Synthesize

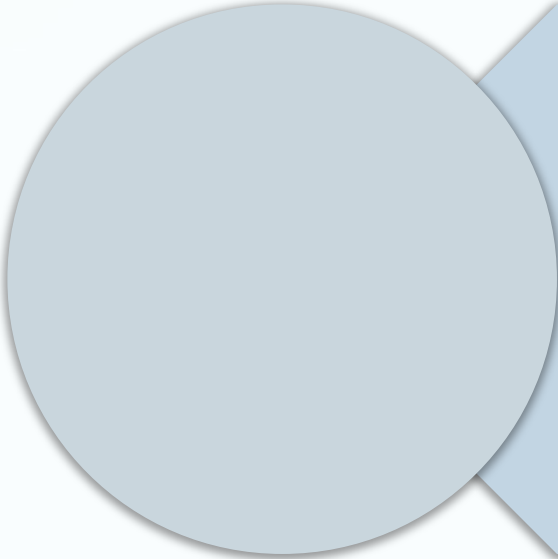- Restructure previous incorrect learning….

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- Within a course or module or learning experience?

- Along the chronology of their studies and educational experiences?

- From one subject or topic or focus or context to another one such as from an exercise to a case study or to an internship?

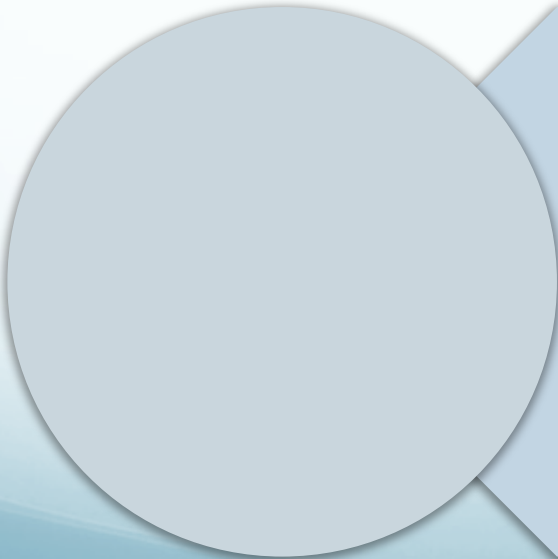# Some Research on Learning That Informs Teaching and Learning
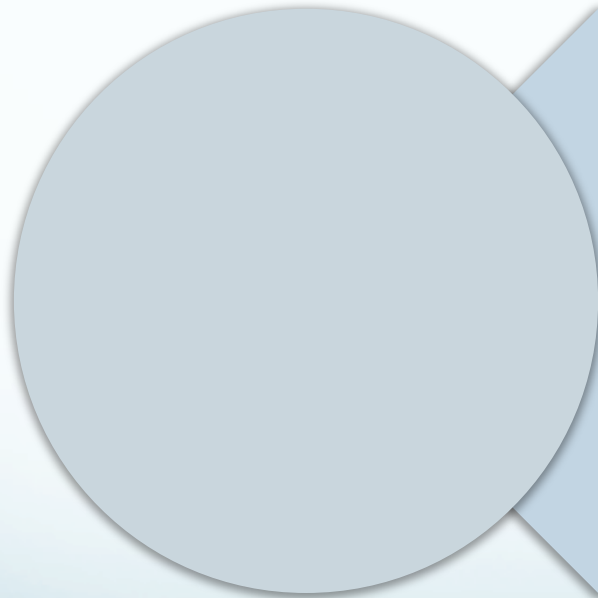
Learners create meaning: egocentricity, sociocentricity, narrow-mindedness, routinized habits

Threshold Concepts: pathways central to the mastery of a subject or discipline that change the way students view a subject or discipline, prompting students to bring together various aspects of a subject that they heretofore did not view as related (Land, Meyer, Smith).
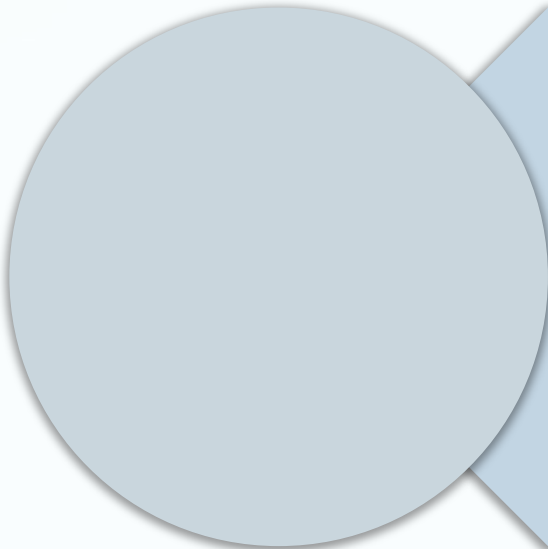
People learn differently and may hold onto folk or naive knowledge, incorrect concepts, misunderstandings, false information
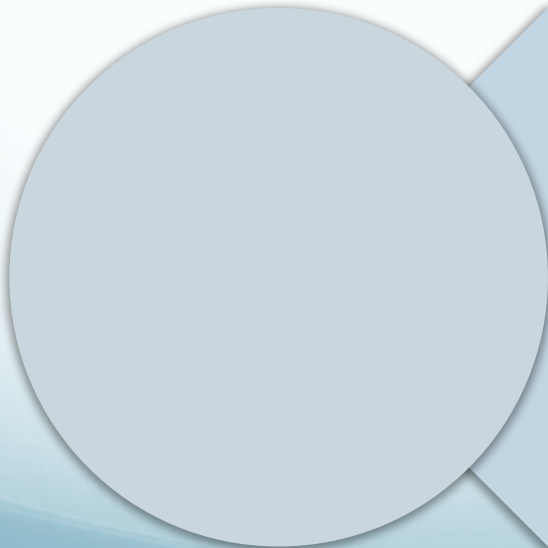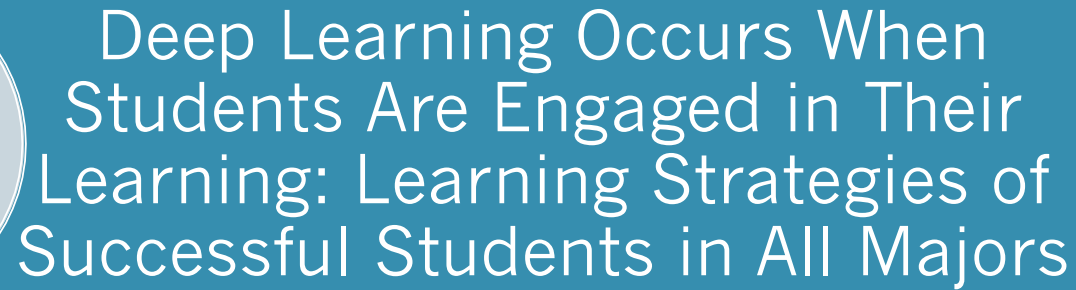
Deep learning occurs over time—transference

Learning Progressions: knowledge-based, web-like interrelated actions or behaviors or ways of thinking, transitioning, self-monitoring. May not be developed successfully in linear progression--thus necessitating formative assessment along the trajectory of learning. Movements towards increased understanding (Hess).

Meta-cognitive processes are a significant means of reinforcing learning (thinking about one's thinking)

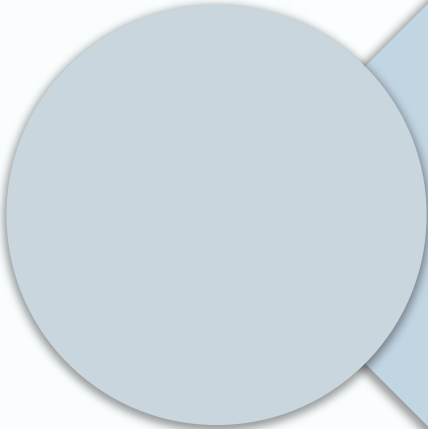Learning involves creating relationships between short-term and long-term memory

Deep Learning Occurs When Students Are Engaged in Their Learning: Learning Strategies of Successful Students in All Majors

- Writing beyond what is visually presented during a lecture

- Identifying clues to help organize information during a lecture

- Evaluating notes after class

- Reorganizing notes after class

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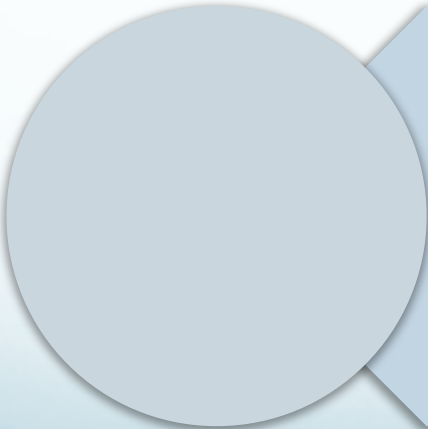
- Comparing note-taking methods with peers

- Using one's own words while reading to make notes

- Evaluating one's understanding while reading

- Consolidating reading and lecture notes

Source: Calvin Y. Yu, Director of Cook/Douglass Learning Center, Rutgers University

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Practice in various contexts creates deep or enduring learning

Inert learning; Activated learning

Transfer of new knowledge into different contexts is important to deepen understanding

- What do you expect your students to demonstrate, represent, or produce by the end of your course, educational experience, program of study, by the end of their undergraduate or graduate studies?

- What chronological barriers or difficulties do students encounter as they learn--from the moment they matriculate?

- How well do you identify and discuss those barriers with students and colleagues and then track students' abilities to overcome them so that increasingly "more" students achieve at higher levels of performance?

How Educators Have Made the Commitment:

Case Study 1: How to restructure incorrect understanding of physics concepts became the work of physics faculty at the University of Colorado (PhET project).

That is, physics faculty became intellectually curious about how they could answer this question to improve students' performance over the chronology of their learning.
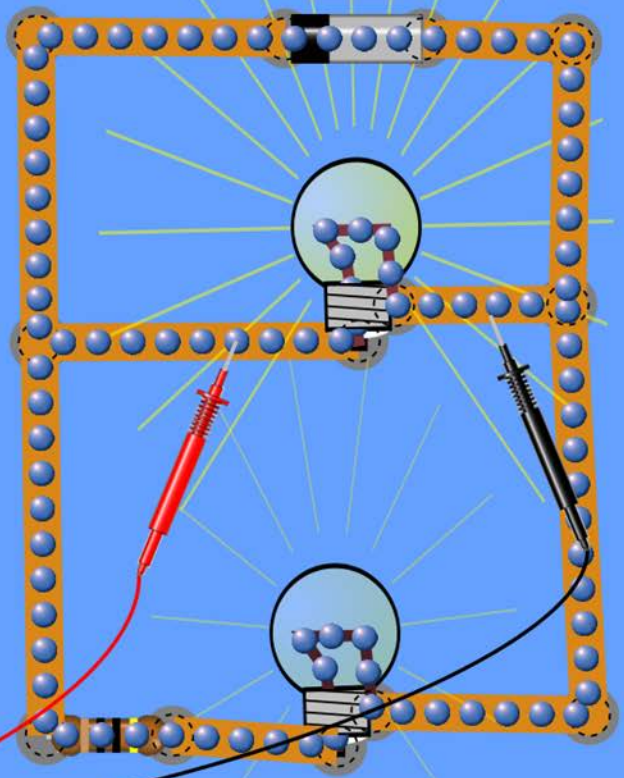
Question?

How does the physics problem reflect what you may be experiencing with your students?

Describe how students manifest this problem.

Case Study 2: How to intellectually engage students in American History 101 through analysis, problem-solving, and inductive reasoning--as opposed to traditional rote memorization or knowledge-based learning-- became the focus of one faculty member's course redesign and pedagogy. That is, a faculty member wondered how to shift from a teacher-centered approach to a student-centered approach that deepened students' understanding of American History.

Reading current research on engaged pedagogies in history, the faculty member learned about the Reacting to the Past Pedagogy developed at Barnard College over 16 years ago—a pedagogy used now at many institutions. Specifically, students play historical games (and take on specific "roles) that position students to connect events to broader social contexts and developments.

To play these games and engage in debates themselves, students must read and synthesize historical texts and secondary resources to become knowledgeable about events, circumstances, and contexts. The games are based on historical dilemmas, debates, and events such as the decision to banish the Puritan, Anne Hutchinson, from the Massachusetts Bay colony.

Question?

How does the history problem reflect what you may be experiencing with your students?

Describe how students manifest this problem.

Case Study 3: How to develop students' abilities to undertake research, to think critically, and to produce effective professional writing products became the focus of a business faculty member who had been chronologically dissatisfied with students' written assignments—weak in all three areas.

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Approaching one of his colleagues in the composition program, he learns about the efficacy of linked courses in engaging students in all aspects of their writing. His colleague shares with him current research on linked courses—disciplinary or professional courses that are linked with composition courses.

That colleague explains that she and her comp colleagues had become convinced from research on writing that students **become more invested in writing courses when they are asked to write about ideas and texts they are studying in another course.** That is, students write better when they are engaged in a subject and have a context for their writing; they also learn better when they write.

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Question?

How does the business program problem reflect what you may be experiencing with your students?

Describe how students manifest this problem.

III. How You Can Make the Commitment: Raise Research or Study Questions

Informal observations around the water cooler

Results of previous assessment along the chronology of learning or at the end of students' studies

Use of a Taxonomy of Weaknesses, Errors, or Fuzzy Thinking (see Handout 1)

Some Examples of Research/Study Questions

What kinds of erroneous ideas, concepts, or misunderstandings predictably interfere with students' abilities to learn or may account for difficulties they encounter later on?

What unsuccessful approaches do students take to solve representative disciplinary, interdisciplinary, or professional problems? Counter that with learning about how successful students solve problems.

What conceptual or computational obstacles inhibit students from shifting from one form of reasoning to another form, such as from arithmetic reasoning to algebraic reasoning?

What kinds of cognitive difficulties do students experience across the curriculum as they are increasingly asked to build layers of complexity?

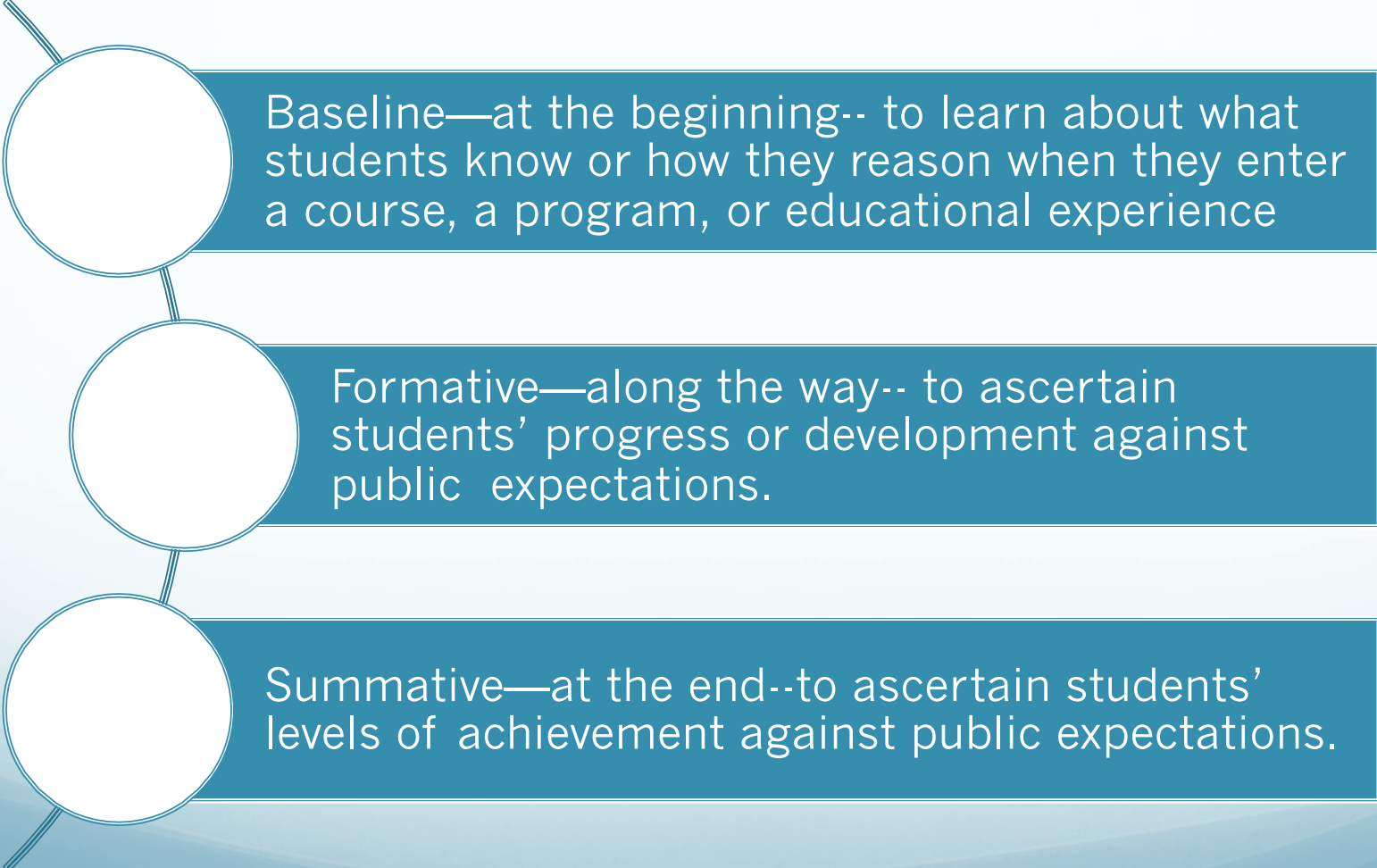**Program outcomes** → **Course or experience outcomes** → **Criteria/ standards to assess outcome** → **Course design: pedagogy Learning context** → **Assignments** → **Student Feedback**

Align for Learning

Chronologically Collect and Assess Evidence of Student Learning

Baseline—at the beginning-- to learn about what students know or how they reason when they enter a course, a program, or educational experience

Formative—along the way-- to ascertain students' progress or development against public expectations.

Summative—at the end--to ascertain students' levels of achievement against public expectations.

What if you….

Collaboratively use what you learn from SOTL to design the *next generation* of curricula, pedagogy, instructional design, educational practices, and assignments to help increasingly more students successfully pass through trouble spots or overcome learning obstacles;

and, thereby, collaboratively commit to fostering students' enduring learning in contexts other than the ones in which they initially learned.

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