

2020 STEM Teaching and Learning Workshop
Wiley Publishing

Integrating Learning & Experience in STEM

Fostering Deep and Flexible Learning

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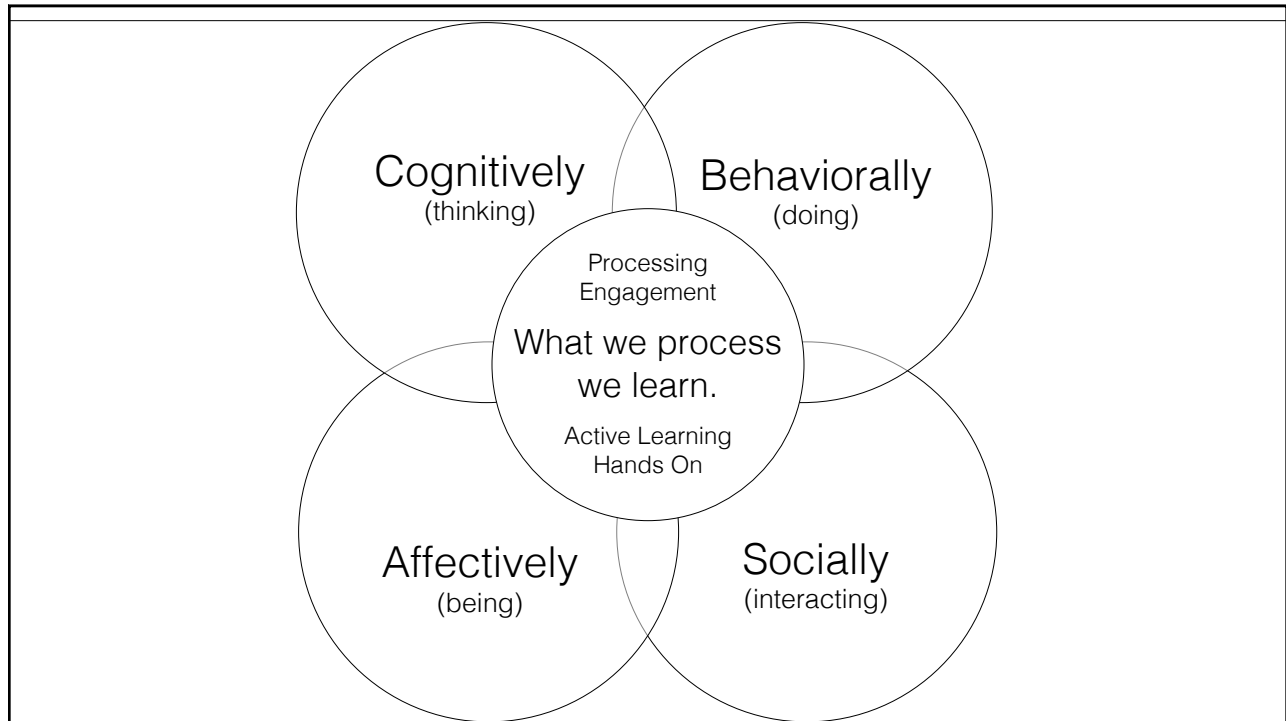
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1

Learning and Memory

Words →

2



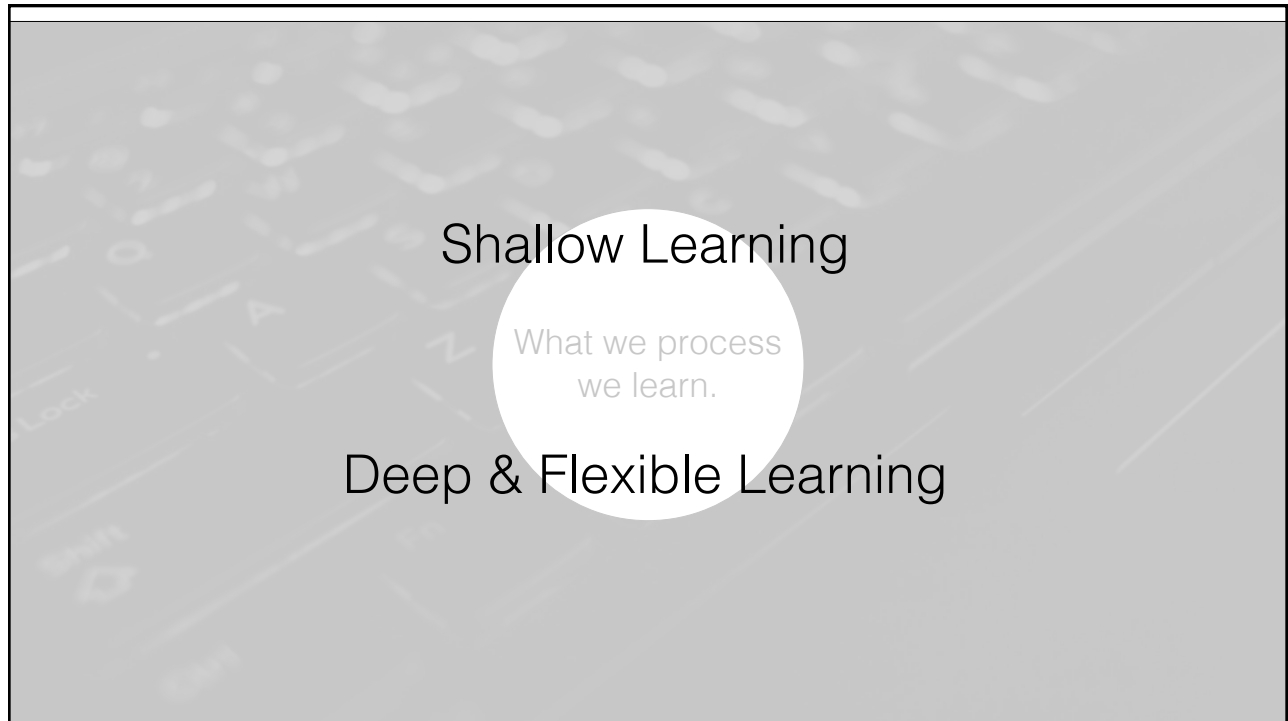
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6 Principles of Deep and Flexible Learning

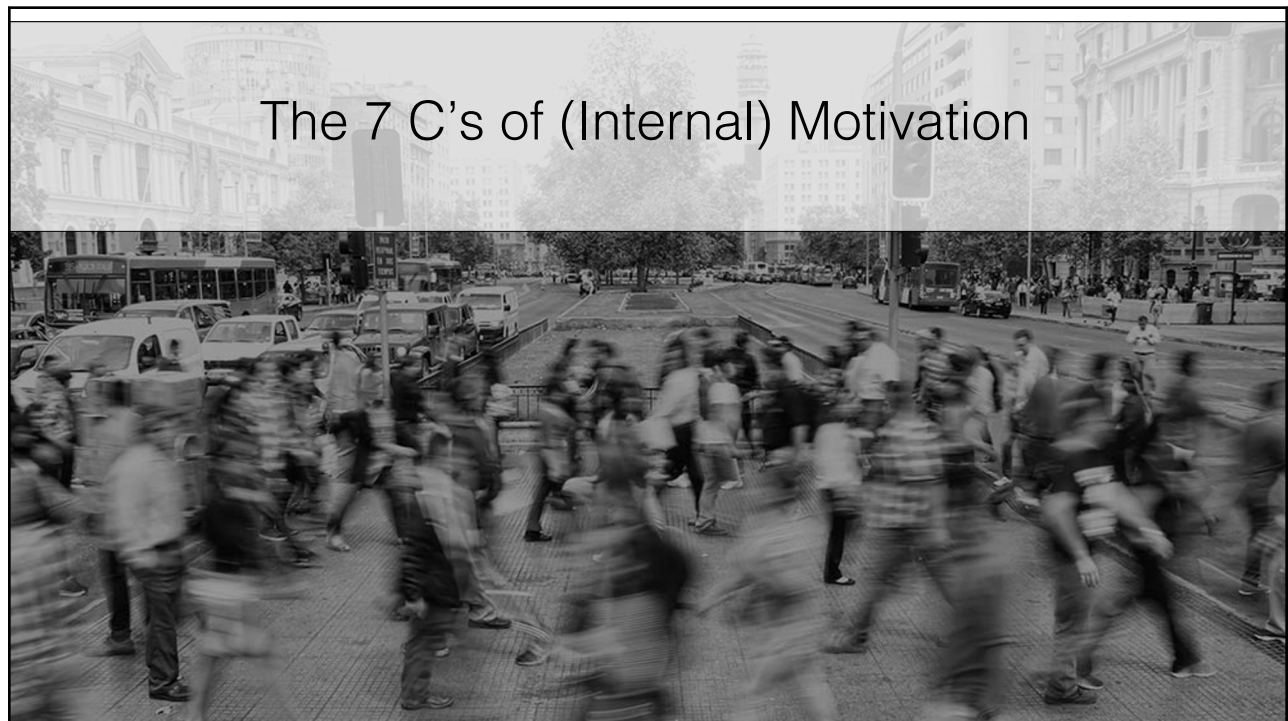
1. Learning through practice at retrieval
2. Learning through varied tasks and purposes
3. Learning at the principle level
4. Learning awareness and control (metacognition)
5. Learning in response to developmental feedback
6. Learning embedded in prior knowledge and experience

(Engle, 2006; Halpern & Hakel, 2003; Mariano, Doolittle, & Hicks, 2009; Wagner, 2006)

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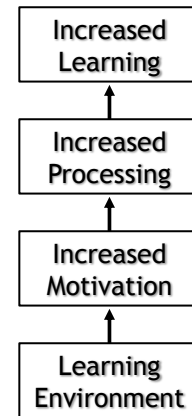
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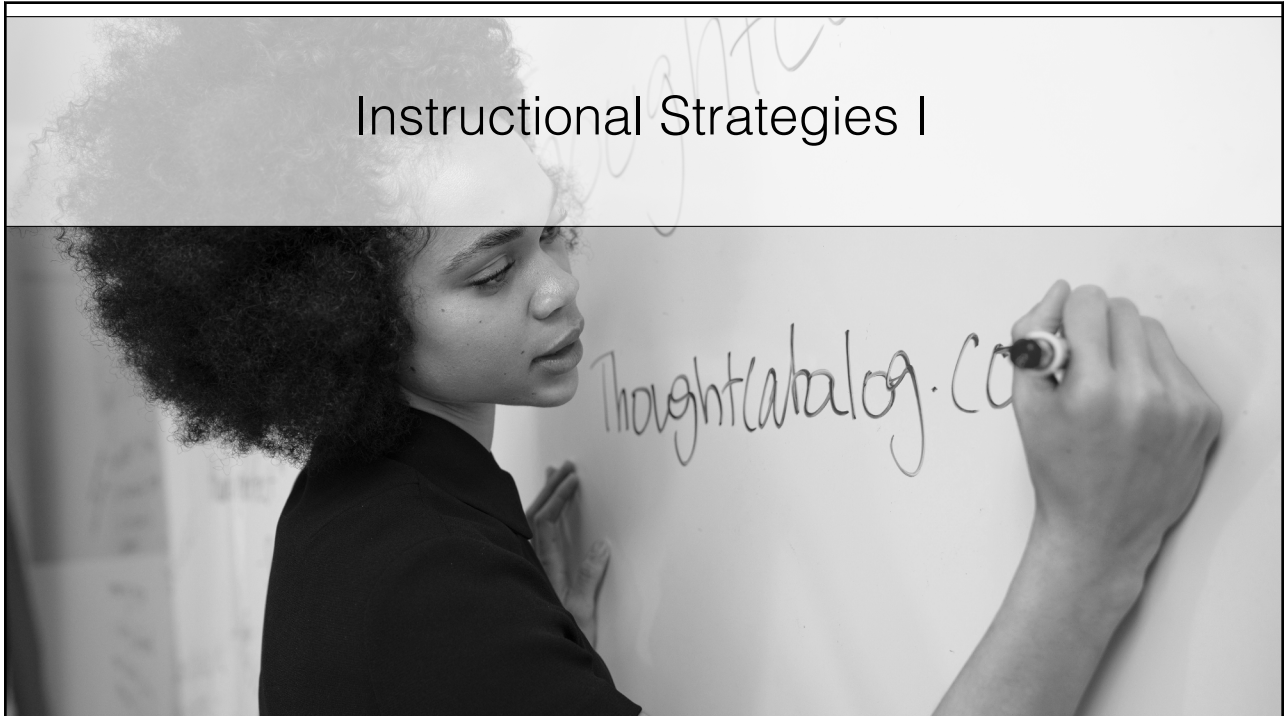
The 7 C's of (Internal) Motivation

1. Choice
2. Caring (interest/value)
3. Control
4. Challenge
5. Collaboration
6. Competence
7. Curiosity



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Instructional Strategies I



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25-Word Summaries

Learning Environment: Students create clear and coherently organized 25-word summaries that reflect the essential meaning of the current reading, lecture, video, movie, activity, or experience.

Learning Artifact: Students analyze and interpret a reading, lecture, video, movie, activity, or experience in order to extract the essential meaning and compose a 25-word summary.

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25-Word Summaries

A Sample (after reading an article):

Through developing, implementing, and assessing model-eliciting activities, engineering faculty members' beliefs and decisions about teaching, learning, and assessment shift from teacher-centered toward student-centered.

[23 Words]



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25-Word Summaries

Grading: Each Chapter Summary Statement is worth 50 points and will be graded using the following criteria:

- | | |
|--|--------|
| 1. Structural Format | 10 pts |
| a. Is the summary 25 words or less? | |
| b. Is the summary a coherent sentence, or sentences? | |
| c. Does the summary avoid a simple listing of concepts, terms, or themes? | |
| 2. Clarity of Thought and Expression | 15 pts |
| a. Are the ideas expressed well, well thought out, and integrated? | |
| c. Does every word in the summary have a meaningful purpose? | |
| d. Are correct grammar and syntax used? | |
| 3. Delineation of Core Message | 25 pts |
| a. Does the summary accurately reflect the reading's central or essential message? | |
| b. Are the reading's central or essential messages fully integrated? | |
| c. Does the summary reflect an understanding of the reading? | |

Plus Developmental Feedback



with Dragon Dictate

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25-Word Summaries

- ✓ 1. Learning through practice at retrieval
- ✓ 2. Learning through varied tasks and purposes
- ✓ 3. Learning at the principle level
- ✓ 4. Learning awareness and control (metacognition)
- ✓ 5. Learning in response to developmental feedback
- ✓ 6. Learning embedded in prior knowledge and experience

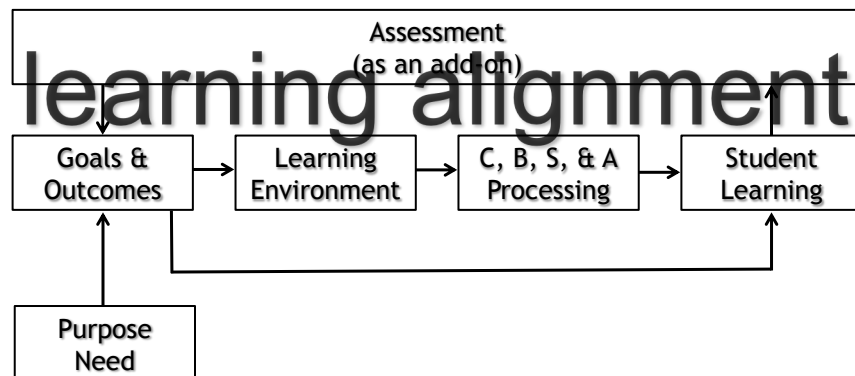
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Instructional Design w/Embedded Assessment

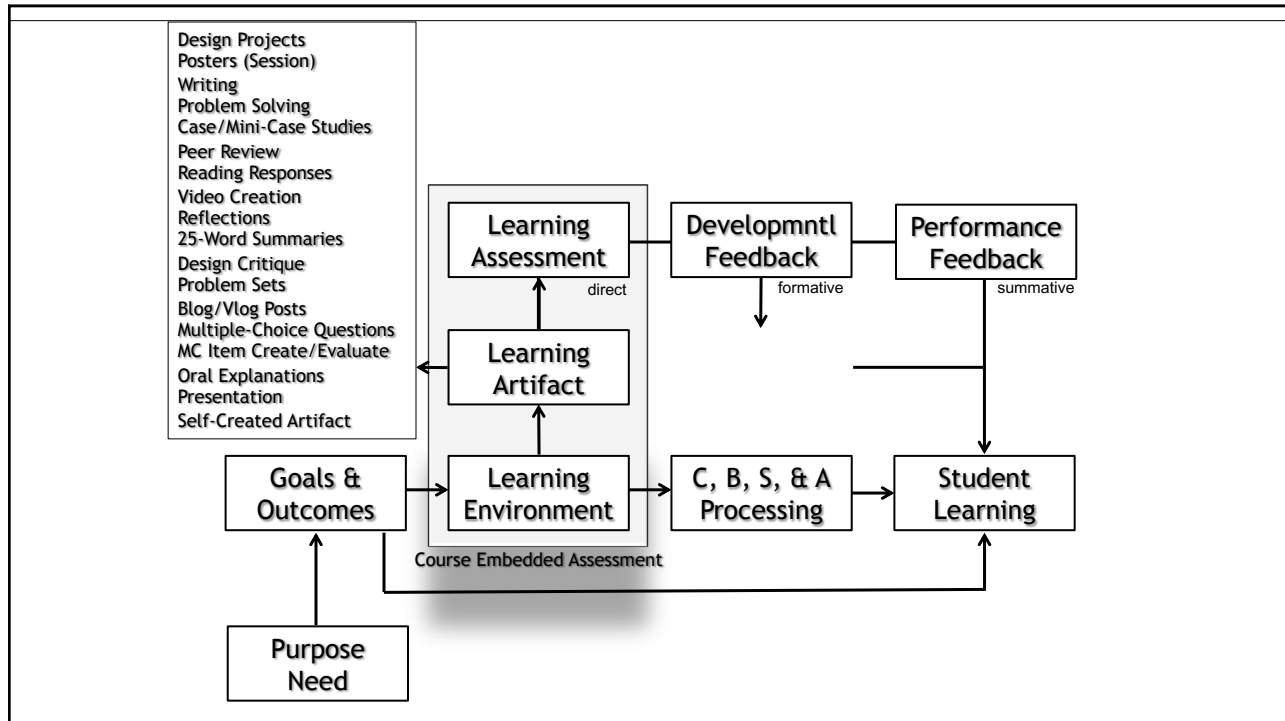


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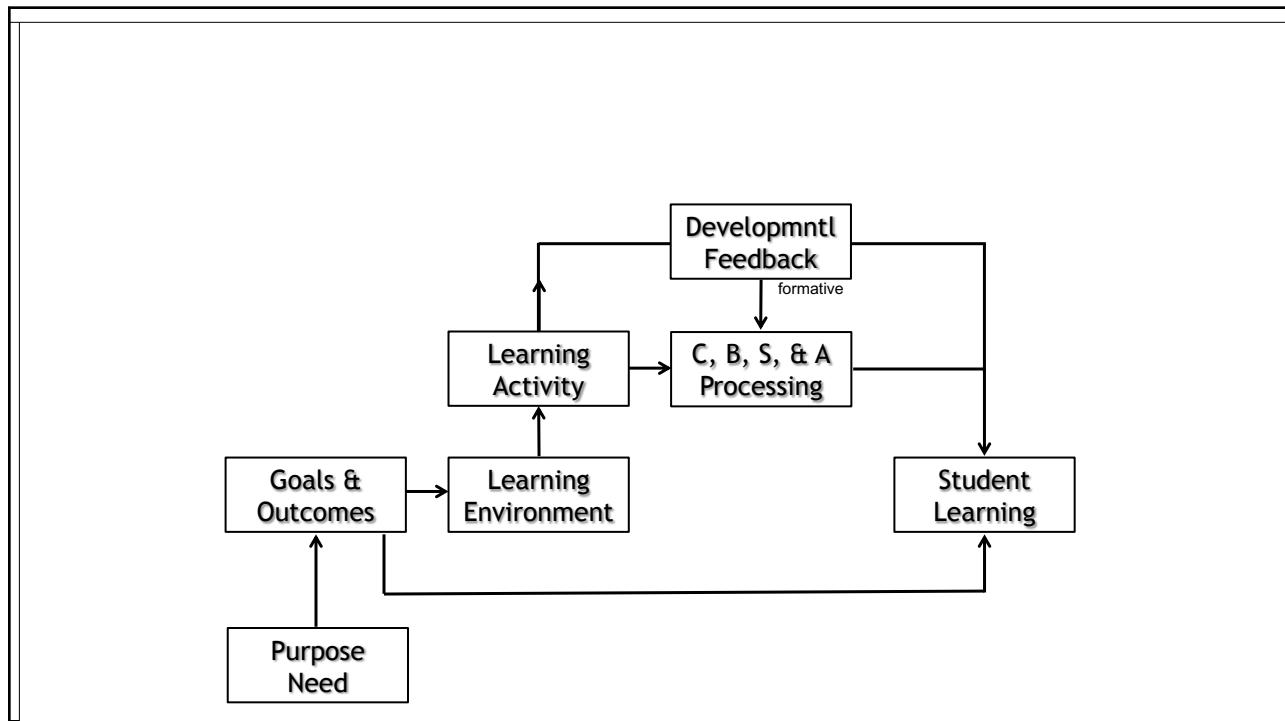
Instructional Design w/Embedded Assessment



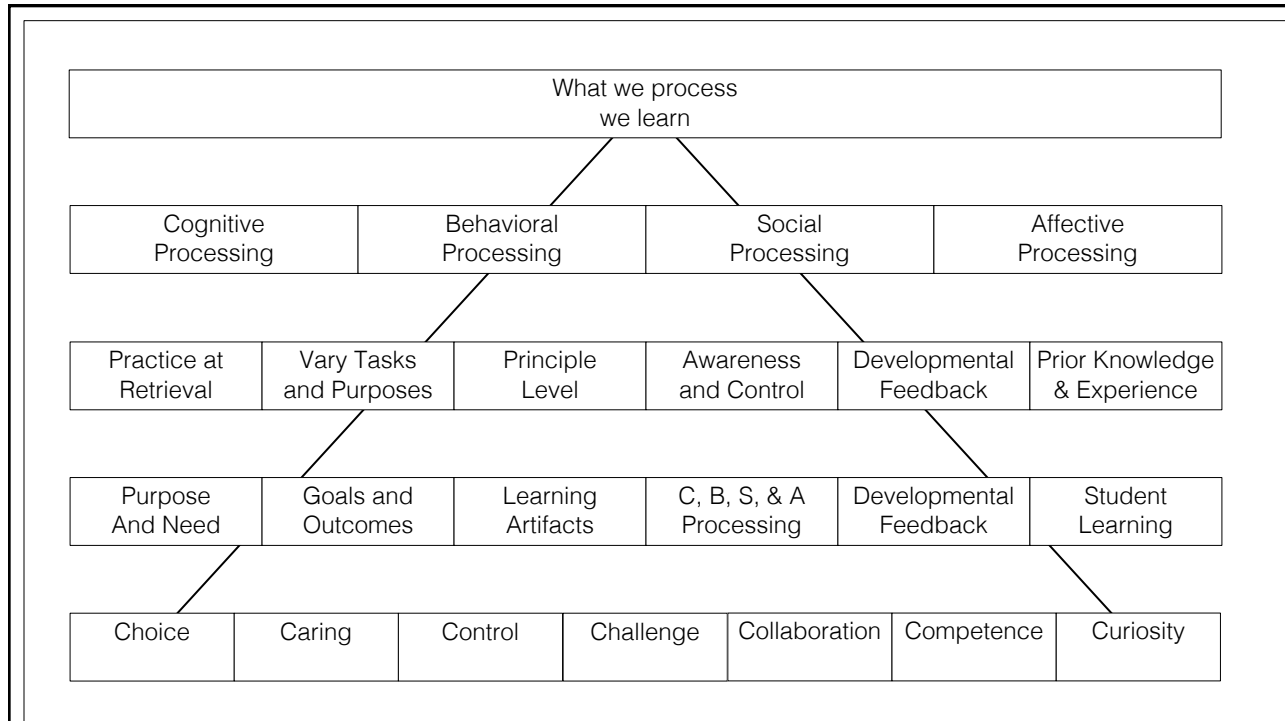
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