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M 605.50: Learning Theories in Mathematics

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MATH 605 (Fall 2020- Online)
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Omnium rerum principia parva sunt - Cicero

This course will survey learning theories in mathematics starting from behaviorism onto constructivist and complexity theories that inform learning. We will also focus on theory development shifts toward model development- i.e., modeling perspectives as alternatives to traditional theories. In other words, models of mathematical cognition that are applicable to the learning of arithmetic, algebra, geometry, statistics and Calculus.

Texts (provided as a pdf files)

- Sriraman, B., and English, L. (2010). *Theories of Mathematics Education*. Springer Berlin
- Selection of readings from the research literature.

Course Objectives

- To familiarize students' with mathematics education learning theories.
- Students begin to engage with the literature to prepare for action research

Note: This is a 600 level reading intensive graduate course and I expect you to take the initiative to complete all the readings in a timely manner. You will have the following assignments to complete over the course of the semester

ASSIGNMENTS – All assignments should be sent via email where applicable

SUMMARIES OF WEEKLY READINGS 40 points [2 x 20]

You will complete 2 summaries (reviews) of the weekly readings. The summary should be approximately 1500 words and provide a gist of the reading, the learning theory framework used (if any) and implications for teaching/learning mathematics. You are free to choose which readings you would like to summarize.

Summary 1 is due Sept. 28; Summary 2 is due October 28.

DISCUSSION THREAD ON MOODLE 40 points [10 for leading, and 30 for reactions]

Each student will initiate ONE discussion thread (as a Discussion Leader) based on one weekly reading, with questions related to the reading. All other students are expected to react to the questions posed. A schedule will be provided for this starting August 31st.

RESEARCH 40 points

This assignment will introduce in a microscopic way the realities of writing a qualitative math-ed project or Master's thesis. You will "hypothetically" design a small study in this course. The prudent thing to do is to align this closely to the readings. This experiment can be either a replication of a study you have reviewed/read; an extension of a study; or something brand new if you wish. You will write a 2000 word "mock" research paper that provides details of your study – which includes the research question (or questions), the learning theory framework and implications of this study for your practice. Due date: November 19th.

GRADES: 108-120: A; 96-107:B; 84-106:C; 72-83: D; < 72: F