

GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
OFFICE OF EDUCATION SERVICES

EDPD 505:6D1 Self-Regulated Learning in Scientific Research Setting
Fall/2017
Wednesdays, 5:00-7:50
September 6, 2017- December 13, 2017
TBA High School at LCPS

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COURSE DESCRIPTION:

Incorporates experience of developing a literature review as rational for posing a scientific question and understanding of self-regulated learning in undertaking research in science, particularly in forming a problem statement based on prior research. Builds fundamental knowledge of:

- 1) How to develop a literature review and connect the literature review with a sophisticated research question
- 2) The ways self-regulated learning strategies are used in synthesizing prior research into a rationale for new scientific investigations
- 3) How self-regulated learning and cognitive apprenticeships are related

COURSE PURPOSE AND INTENDED AUDIENCE:

The purpose of this course is to give secondary science teachers experiences in doing background research to develop a literature review for the purposes of proposing a sophisticated research question in science. Once mastered, the secondary teachers will then identify connections of the self-regulated learning processes they used in developing the literature review with a cognitive apprenticeship model.

COURSE FORMAT:

The course format can be segmented into four types of activities:

- conducting research for developing a literature review
- in-depth analysis of processes required for developing problem statement from prior research
- analysis of self-regulated learning strategies for developing problem statement, literature, review and research question for a scientific investigation proposal
- comparison of processes involved in a cognitive apprenticeship, self-regulated learning, and scientific research

STUDENT OUTCOMES:

The goal of this course is to provide secondary teachers with the knowledge and skills necessary to conduct scientific research to compose a sophisticated research question and identify the conceptual framework of self-regulated learning and cognitive apprenticeships. To that end, the course objectives are to:

- experience approaches used to connect the literature review with a sophisticated research question
- identify self-regulated learning strategies and cognitive apprenticeship strategies used solve a particular task associated with research question development
- produce a sophisticated research question with supporting argumentation and a reflection of how the self-regulated learning was helpful in accomplishing the task

PROFESSIONAL STANDARDS :

National Board for Professional Teaching Standard, Core Proposition 2

INTASC Standards 1-10

NSTA Standards: Research, Safety, Inquiry

REQUIRED/SUPPLEMENTAL/RECOMMENDED TEXTS AND/OR READINGS:

Required Texts: Articles used for each personalized investigation proposal

Supplemental Readings:

- Peters-Burton, E. E. (2015). Outcomes of a self-regulatory curriculum model: Network analysis of middle school students' views of nature of science. *Science & Education*, 24, 855-885. DOI: 10.1007/s11191-015-9769-3
- Peters, E.E. (2012). Developing content knowledge in students through explicit teaching of the nature of science: Influences of goal setting and self-monitoring. *Science & Education*, 21(6), 881-898. doi 10.1007/s11191-009-9219-1

- Peters-Burton, E. E. (2013). Self-regulated learning as a method to develop scientific thinking. In I. M. Saleh and M. S. Khine (Eds.), *Approaches and Strategies in Next Generation Science Learning* (pp. 1-26). Hershey, PA: IGI Global.
- Peters-Burton, E. E., Merz, S. A., Ramirez, E. M., & Saroughi, M. (2015). The effect of cognitive apprenticeship-based professional development on teacher self-efficacy of science teaching, motivation, knowledge calibration, and perceptions of inquiry teaching. *Journal of Science Teacher Education*, 26(6), 525-548.

Additional Resources:

- Will be provided electronically by the instructor on the course web site.
- Because this course is flexible to the needs of the teachers, other articles/handouts than the ones indicated on this syllabus may be distributed in class or posted on-line at the course website.
- It is expected that the readings assigned for the class will be completed before the class meeting.

COURSE REQUIREMENTS, PERFORMANCE-BASED ASSESSMENTS, EVALUATION CRITERIA, AND GRADING SCALE:

Due to the interactive nature of this course, attendance is required at all sessions. If an emergency situation occurs (e.g., accident, illness), please contact the instructor as soon as possible to discuss possible make-up work. Repeated absences will result in loss of course credit.

Course grades will be based equally on participation in class activities (discussions, labs, etc.) and two inquiry-based lesson plans (with iterative feedback from the instructor and peers) that participants present on the last days of class. See the assignment rubrics for more information.

GRADING SCALE:

- A = 93-100%
- A- = 90-92%
- B+ = 88-89%
- B = 80-87%
- C = 70-79%
- F = Below 70%

COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT STATEMENT OF EXPECTATIONS:

The Graduate School of Education (GSE) expects that all students abide by the following:

Students are expected to exhibit professional behavior and dispositions. See gse.gmu.edu for a listing of these dispositions.

Students must follow the guidelines of the University Honor Code. See http://www.gmu.edu/catalog/apolicies/#TOC_H12 for the full honor code.

Students must agree to abide by the university policy for Responsible Use of Computing. See <http://mail.gmu.edu> and click on Responsible Use of Computing at the bottom of the screen.

Students with disabilities who seek accommodations in a course must be registered with the GMU Disability Resource Center (DRC) and inform the instructor, in writing, at the beginning of the semester. See www.gmu.edu/student/drc or call 703-993-2474 to access the DRC.

PROPOSED CLASS SCHEDULE:

Class sessions, readings and assignments may change according to the needs of the class

Date	Topic/Learning Experiences	Readings/Assignments
September 6	<ul style="list-style-type: none"> • Syllabus • Purposes of conducting a literature review 	<ul style="list-style-type: none"> • Forethought Form • SRL inventory • Literature review experiences
September 13	<ul style="list-style-type: none"> • Theories of SRL • How are you a self-regulated learner? • How are your students self-regulated learners? 	<ul style="list-style-type: none"> • Readings on website • Journal reflection
September 20	<ul style="list-style-type: none"> • Cognitive apprenticeships • In what ways do you do cognitive apprenticeships? • How can you improve the cognitive apprenticeship processes in your class? 	<ul style="list-style-type: none"> • Readings on website • Journal reflection
September 27	<ul style="list-style-type: none"> • Identifying a topic • Finding articles and resources • Evaluating reliable resources • Ensuring saturation 	<ul style="list-style-type: none"> • SRL microanalysis form • Readings on website • Journal reflection

October 4	<ul style="list-style-type: none"> • Self-regulated learning strategies and cognitive apprenticeship strategies for <ul style="list-style-type: none"> ○ Identifying a topic ○ Finding articles and resources ○ Evaluating reliable resources ○ Ensuring saturation 	<ul style="list-style-type: none"> • Readings on website • Journal reflection • Compile SRL strategies in toolbox
October 11	<ul style="list-style-type: none"> • Analyzing the literature <ul style="list-style-type: none"> ○ Overview ○ Grouping ○ Organizing groups 	<ul style="list-style-type: none"> • SRL microanalysis form • Readings on website • Journal reflection
October 18	<ul style="list-style-type: none"> • SRL and cognitive apprenticeship strategies for analyzing the literature <ul style="list-style-type: none"> ○ Overview ○ Grouping ○ Organizing groups 	<ul style="list-style-type: none"> • Readings on website • Journal reflection • Compile SRL strategies in toolbox
October 25	<ul style="list-style-type: none"> • Summarizing literature <ul style="list-style-type: none"> ○ Table ○ Concept maps 	<ul style="list-style-type: none"> • SRL microanalysis form • Readings on website • Journal reflection
November 1	<ul style="list-style-type: none"> • SRL and cognitive apprenticeship strategies for summarizing literature <ul style="list-style-type: none"> ○ Table ○ Concept maps 	<ul style="list-style-type: none"> • Readings on website • Journal reflection • Compile SRL strategies in toolbox
November 8	<ul style="list-style-type: none"> • Writing the literature review <ul style="list-style-type: none"> ○ Table ○ Concept maps 	<ul style="list-style-type: none"> • SRL microanalysis form • Readings on website • Journal reflection
November 15	<ul style="list-style-type: none"> • Writing the literature review <ul style="list-style-type: none"> ○ Table ○ Concept maps 	<ul style="list-style-type: none"> • SRL microanalysis form • Readings on website • Journal reflection
November 22	Thanksgiving Break	

November 29	<ul style="list-style-type: none"> • SRL strategies and cognitive apprentice strategies for writing the literature review <ul style="list-style-type: none"> ○ Table ○ Concept maps 	<ul style="list-style-type: none"> • Readings on website • Journal reflection • Compile SRL strategies in toolbox
December 6	<ul style="list-style-type: none"> • Developing a coherent essay 	<ul style="list-style-type: none"> • SRL microanalysis form • Readings on website • Journal reflection
December 13	<ul style="list-style-type: none"> • SRL strategies and cognitive apprenticeship strategies for developing a coherent essay 	<ul style="list-style-type: none"> • Readings on website • Journal reflection • Compile SRL strategies in toolbox

Example Literature Review Rubric
(TENTATIVE _ WE WILL BE REVISING IN CLASS)

	Pass		Fail
	Target (15 points)	Acceptable (12 points)	Unacceptable (0 point)
Content	This inquiry question was well established in broader context of an educational topic. (2 pts).	The inquiry question was established in the context of an educational topic (1.8 pts).	The inquiry question was not established in the context of an educational topic.
	At least 12 articles were selected and each specifically related to the initial inquiry question. (2 pts).	At least 10 articles were selected and related to the initial inquiry question (1.8 pts).	A couple of articles were selected; some minimally related to the inquiry question.
	The findings/results of articles were thoughtfully compared, contrasted and/or connected to each other. (2 pts).	The finding of articles were compared, contrasted and/or connected to each other (1.8 pts).	The findings of articles were mentioned with little and or no comparison or connection to each other.
	The conclusion of the review summarized the knowledge found from this review and related the knowledge gain to the inquiry question (2 pts).	The conclusion of the review summarized the knowledge found from this review (1.8 pts).	The conclusion of the review did not summarize the knowledge found from this review.
	The references were cited using APA style (2 pts)	The references were listed (1.8 pts)	The references were not listed
Organization	The review was organized using subheadings. The review was suitably organized considering the contents of the selected articles. (3 pts)	The review was suitably organized considering the contents of the selected articles (1 pts).	The review was minimally organized and writing was difficult to follow throughout.
Mechanics	There were no grammatical, spelling and/or punctuation errors and transitional phrases were used to guide the reader throughout the text (2 pts).	There was an occasional grammatical, spelling and/or punctuation error that did not distract the reader (1 pts).	There were many grammatical, spelling and/or punctuation errors that distracted the reader from the content of the writing.