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M 504.01: Seminar - Topics in Math Education

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MATHEMATICS EDUCATION SEMINAR
MATHEMATICS 504 – SECTION 1
CRN: 34797

INSTRUCTOR

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COURSE DESCRIPTION

The Programme for International Student Assessment (PISA) is an international survey which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. It is given every three years. Around 510,000 students in 65 economies took part in PISA 2012 representing about 28 million 15-year-olds globally. The results of the PISA 2012 survey were released on December 3, 2013. Our seminar will examine results of the PISA 2012 survey while learning about how PISA has and continues to influence rhetoric that shapes policy in mathematics education in the United States and the world.

COURSE GOALS

Upon successful completion, students will be able to:

1. Report a minimum of three important findings resulting from PISA 2012 and their implications for mathematics education in the United States,
2. Describe the framework for the mathematics component of the PISA exam,
3. Explain how the PISA 2012 results apply to gender comparisons of performance in mathematics, and,
4. Explain how the PISA 2012 results apply to comparisons of performance in mathematics for students of diverse socio-economic backgrounds.

TEXT

[Pereyra, M. A., Kotthoff, H. G. & Cowen, R. \(eds.\).\(2011\). *Pisa under examination: Changing knowledge, changing tests and changing schools.* Boston, MA: Sense Publishers.](#)

FORMAT

Participants in the seminar will be asked to prepare and present at least once

during the semester. Each presenter should come prepared to accomplish two goals:

- 1) Help seminar participants know the PISA survey by one of two means.
 - a) Lead a discussion of an assessment item from the PISA released items in mathematics. The item should be provided to seminar participants one week in advance of discussion. A written solution and your critique of the problem are due on the day of presentation (500 words).
 - b) Present a well-researched and factually supported answer to one of the PISA big questions listed below. A written summary of our findings is due on the day of the presentation (500 words).
- 2) Help seminar participants understand the effects of the PISA exam by leading a discussion of an article chosen from our text. Your role will be to lead seminar participants in purposeful discussion that moves beyond a reiteration of main points made in the article. For example you might motivate discussion that seeks to elicit the implications of the article's findings on practice or policy or curriculum design in mathematics education.

PISA BIG QUESTIONS

1. What entity is responsible for authoring and administering the PISA exam?
2. Who takes the PISA exam?
3. What types of mathematical knowledge does PISA assess?
4. Historically, how has the US performed on the PISA assessments in mathematics?
5. What does PISA tell us about the mathematical performance of boys versus girls in mathematics in the US and elsewhere?
6. What does PISA tell us about the mathematical performance of students from diverse socio-economic backgrounds in the US and elsewhere?
7. How does PISA insure the validity and reliability of its assessment items across a diversity of languages?

END PRODUCT

Students taking the seminar for credit will be expected to collaborate to produce an "end product" of our semester-long study of the PISA survey. This product will be an article intended to inform Montana teachers of mathematics about the PISA survey, the PISA 2012 results and the implications of PISA to their practice. We will seek publication of this article in the Montana Council of Teachers of Mathematics newsletter. This end product is due the day of the final exam.

FINAL

A final exam that measures student acquisition of the learning goals of the course will be given to students taking the seminar for credit. You are allowed to use your notes on the exam.

GRADING

Presentation	8 Points
End Product	16 Points
Final	16 Points
Total	40 Points

SEMESTER SCHEDULE

DATE	PRESENTER	BIG QUESTION or SAMPLE PROBLEM	CHAPTER
January 28	Organizing Meeting		
February 4	Matt Roscoe	SAMPLE PROBLEM	CHAPTER 6
February 11	Rachel Chaphalkar	BIG QUESTION #4	CHAPTER 14
February 18	Beth Lask	BIG QUESTION #5	CHAPTER 8
February 25	Grant Swicegood	BIG QUESTION #6	CHAPTER 16
March 4	Meredith Berthelson	SAMPLE PROBLEM	CHAPTER 5
March 11	Jack Lelko	BIG QUESTION #2	CHAPTER 10
March 18	Adam Clinch	BIG QUESTION #3	CHAPTER 15
March 25	Andria Disney	BIG QUESTION #1	CHAPTER 11
April 1	SPRING BREAK		
April 8			
April 15			
April 22			
April 29			

May 6

Final: Monday, May 12, 8:00-10:00AM

LINKS

[PISA \(OCED\)](#)

[PISA \(NCES\)](#)

[PISA RELEASED ITEMS – MATHEMATICS 2012 & 2006](#)

[PISA RELEASED ITEMS – MATHEMATICS 2012 & 2006](#)

[ABOUT PISA \(OCED\)](#)

[PISA 2012 NBC NEWS REPORT](#)

[PISA 2012 AFT VIDEO](#)