

ED 4161 The Teaching of Mathematics in the Intermediate and Secondary School.

Instructor: Margo Kondratieva

Assignment 1. Position Statement. Due September 21, 2009

1. Read **Chapter 1** from: M.Goos, G.Stillman, C.Vale, *Teaching secondary school mathematics*, 2007.

2. Recall your experiences and time spent in mathematics classes at all levels (elementary, secondary, university).

3. Record and submit **one pages** itemized summary of your personal position at this time about the following:

- Nature of Mathematics

What is mathematics? From where does mathematical knowledge come? How do we know if mathematics claim is true? What excites you about mathematics? What do you dislike about mathematics? Is there a statement or notion in mathematics which you regard as being counter-intuitive or surprising?

- The student of mathematics

How do high school students generally feel about math? How do students best learn mathematics?

- The teacher of mathematics

What makes a good mathematics teacher? What makes a good mathematics lesson? Describe any concerns you have with the way mathematics is taught. What, in your opinion, are the challenges of teaching mathematics today?

- Mathematics and society

Why teach mathematics? Why do/should students study mathematics? What benefits does the society gain by having graduates who have studied mathematics?

(*)Here are some guiding questions. You do not need to answer all of them now. Just think. This page will be later converted into your Teaching Philosophy document, a part of your Teaching Portfolio (Due Dec 2).

A **sample** of a summary regarding "The teacher of mathematics".

Margo's position statement submitted 09.09.09 .

Principles of effective teaching in mathematics.

1. Effective teacher of mathematics **leads** students in their study by own example of:

- deep and broad understanding of the subject;
- enthusiastic and creative approach to problem solving;
- openness to new mathematical investigations and learning.

These three rules are based on my own experience and observations of great mathematics teachers. They are difficult to implement but it is absolutely necessary to try! Teachers need to know their material well, but even then there is always a room for learning something new.

2. Effective teacher of mathematics **supports** students' learning of the subject by:

- revealing connections among mathematical concepts and procedures;
- explaining different facets of an idea and various approaches to a solution as well as their advantages and disadvantages;
- revisiting and reinforcing "simple but powerful" basic ideas and principles;
- revising the concepts that students have previously studied and laying the groundwork for concepts to be studied later;

Students need to see the connections between different topics and from year to year. Without showing the global structure of math, multiple connections, and revisiting material students will be lost in the ocean of formulas and facts. I'm using these ideas all the time.

3. Effective teacher of mathematics **motivates** students to do mathematics by:

- emphasizing the intrinsic value of learning and self-improvement, helping to develop mastery goals as opposed to ego goals;
- engaging students in meaningful relevant, and rich learning tasks stimulating their interest in the subject;
- evoking cognitive and sensory curiosity through demonstration of unexpected results and using artifacts;
- helping students to develop self-confidence by providing challenging activities at the appropriate level of difficulty and inquiry.

Motivation is often a big problem in mathematics classes, and you as a teacher can make a big difference by showing support and concern about students' achievements.

Also, bring in class smart games, puzzles, interesting problems and you will see the evidence of learning without explicit drilling! It does not always work as designed, but if it does, it is very rewarding.