TEACHING STATEMENT

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1. Teaching philosophy

I enjoy teaching mathematics a lot. I was very fortunate to study at an excellent math-oriented school and to have been taught by an amazing math teacher N. Strelchenko who has always been my role model.

I believe that one of the most important goals for any teacher is to encourage their students and get them interested in the subject. When preparing for a class I always think what interests me personally in the particular topic. For example, the associativity law $a(b+c) = ab+ac$. I usually explain it by drawing candies positioned in the rectangles $2 \times 4$ and $3 \times 4$ and together forming the rectangle $5 \times 4$. Counting candies in two ways leads to their total number being 20. I want my students to understand ideas like that and hence see that learning math is fun.

As an instructor at Kent State University, I observed that a lot of students find it difficult to pass from particulars to generalizations. For example, many students can easily compute the value of $2 \cdot 5^2 - 5 \cdot (5+1)$, but feel negative about simplifying an expression like $2x^2 - x(x + 1)$. I always try to make this transition from examples to general rules fun for them: instead of $x$, $y$ and other standard notations I often draw “cats”, “dogs”, “boys”, “girls” etc. It makes the students go through the new experience of math education which a lot of them enjoy, and it helps them to develop abstract thinking. I remember, how my school teacher often used to emphasize the meaning of generalizations in math
saying things like “sine squared of a tomato plus cosine squared of the tomato is one!”, or “the integral of the derivative of an elephant is the elephant plus a constant!”.

In my opinion, some of the students prefer to learn a concept by listening and thinking about it for themselves, and some are more comfortable with exploring new material in the process of discussion. I try to make my classes work for both of the types: I ask a lot of questions and encourage the students to answer and participate the learning process actively; on the other hand I never force anyone who prefers to stay silent to give me an immediate feedback during the class.

I always consider all my teaching activities to be of the highest importance. This means that if a student has questions to ask, I am going to be there for them as energetic and encouraging as it gets and for as long as they want. I believe that it is very important to show my students how much I care for them learning the material: when the students see that the teacher really cares for the class, they care for it as well.

I hope to deepen and develop further my teaching experience and methods in my future career. I am interested in teaching courses at any level from remedial undergraduate courses, to advanced undergraduate and graduate courses. I am willing to teach courses devoted to any subject, from Probability Theory and Statistics, to Calculus, to Linear Algebra. I am open to organizing and teaching math circles and doing any extra curricular activities. I would be happy to work in groups with other instructors following a central curriculum, as well as to develop my own courses. I would be interested in developing and teaching a course directly related to my research.

2. Teaching experience at Kent State

Most of my teaching experience is related to the courses I taught as a graduate student at Kent State University. I have taught a number of college math remedial classes: Basic Math I, Basic Math II, Basic Math III, Algebra for Calculus and two classes of Trigonometry. I have also taught Basic Math Concepts II – a course for future elementary school teachers and education majors.

The program for Basic Math I-III consists of such topics as operations with numbers, fractions, percents, linear equations, linear inequalities, functions and graphing, quadratic equations, quadratic inequalities, polynomials, rational functions, trigonometric functions and other topics.
The program of Algebra for Calculus involves working with functions and analyzing them at a deeper level, complex numbers, polynomials and factoring, logarithms and exponents, basics of Statistics and other topics.

Trigonometry is a course devoted to a detailed study of trigonometric functions and underlying geometry, trigonometric identities and problems related to the transformations of trigonometric expressions, trigonometric equations, trigonometric inequalities, Law of sines, Law of cosines, applications of Trigonometry to Geometry and other topics.

The program of Basic Math Concepts II involves such topics as Statistics, Probability Theory, Planar Geometry, three-dimensional Geometry, Vectors and coordinates, and other topics.

I have also worked as a Math Emporium instructor at KSU. The Emporium is a computer based preparatory course which uses ALEKS system. Some other systems I used for my courses include the MyLabsPlus and WhileyPlus homework databases. It is nice to find an appropriate use of modern technologies as a part of the teaching process.

3. EXTRA CURRICULAR ACTIVITIES AT KENT STATE

As a graduate student at KSU I advised undergraduate students Alexandra Sobieska, Alex Kokinov and Chris Walker on their Choose Ohio First Project titled “Knights, Liars and scales”. They developed skills on solving logical problems and Olympiad type problems related to scales. I enjoyed working on the project with the talented and motivated undergraduate students.

Also, I gave a lecture for the students participating in Choose Ohio First program titled “Are all the triangles equilateral?” It is one of my favorite geometrical jokes. I have given the (wrong) proof of the fact that all the triangles are equilateral and challenged the students to find a mistake in the proof.

In addition to that I have served as a judge for the poster session at the Choose Ohio First competition in 2014.

I also assisted Professor Soprunova on her REU project about Discrete Polytopes in 2011.

4. TEACHING AT SCHOOL IN KHARKIV, UKRAINE

Another important part of my teaching experience was a full time job in Kharkiv, Ukraine at High school N°45. I have taught there for a year in 2009/2010. I taught Mathematics for three groups of fifth-graders (10-year olds) and Geometry for one group of ninth-graders (14-year
olds). The high school is mathematically oriented and is considered one of the strongest in my hometown, and even in Ukraine. It was fun to work with those talented kids. The program for the fifth-graders went beyond the standard one in Ukraine. The program in my Geometry class was very advanced, and since the kids were highly talented and interested, I pushed it even further. In the course me and my students went through many advanced topics (for example, Ptolemy’s Theorem for an inscribed quadrilateral, the 9-point Euler circle, Group Theory based on the example of the Group of isometries on the plane and other topics) and were solving problems of extreme difficulty (up to an International Math Olympiad level). I was happy to see that the students learnt the material well and were eager to ask more and more questions.

One of the fascinating activities I did when working at the school was teaching math circles for fifth-graders (10-year olds) and sixth-graders (11-year olds). That involved exploring some exciting topics beyond the standard program with the groups of talented kids. Having received a strong Math Olympiad background as a school student, I enjoyed passing the knowledge and skills to the kids I taught. The topics I chose for the courses included induction, the Pigeonhole principle, Graph Theory, Probability Theory and Combinatorics, Logics (it involved problems from the books by Raymond Smullyan which I myself enjoyed a lot as a kid), Colorings, Sequences, Invariants, different numeral systems, problems related to parity and divisibility, Tiling, problems about weighting and other topics.

5. Training in teaching

During my fourth year of studies at Kharkiv State University I received two months of teacher training at High School N° 27. My instructor was my high school math teacher N. Strelchenko. I was fortunate to get a high level of trust from her; I have substituted all the classes in Algebra and Geometry for her 9th grade for a month. The topics I covered were Set theory, Combinatorics and Probability.

I have also taken courses related to teaching: Theory of teaching (Kharkiv State), Methods of teaching Mathematics (Kharkiv State) and College Teaching (Kent State).

6. Students’ feedback

As it is for any teacher, it is important for me to receive feedback from students. It is always heartwarming to hear from the kids I taught at the school in Ukraine who occasionally get in touch with me and
tell me how much they appreciate all the knowledge I helped them to obtain (many of them are now undergraduate students specializing in math or math-related subjects). It is gratifying to receive e-mails of thanks from my students at Kent State after the courses are done and read positive teaching evaluations. I present some of the quotes from my evaluations transcripts below.

- Very Nice
- Very helpful and knowledgeable =)
- She is a good teacher. She can actually teach. :)
- Ms. Livshyts is great!
- Exams and quizzes were turned back quickly with feedback.
- Miss Livshyts is a very good teacher.
- Always available for help!
- Ms. Livshyts is a great instructor! Very helpful to all students!
- If we didn’t understand her, she explained it to us in a different way.
- Excellent!
- Math is not my favorite subject by any means, but prof. Livshyts was a great instructor
- Wonderful help.
- Offered many opportunities for office hours. Very devoted to her job.
- Great teacher.
- Very good teacher, actually enabled me to like and understand math.