

# Journal of Mathematics Education at Teachers College

Fall – Winter 2010

A CENTURY OF LEADERSHIP IN  
MATHEMATICS AND ITS TEACHING

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The *Journal of Mathematics Education at Teachers College* is a publication of the  
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This issue's cover and those of future issues will honor past and current contributors to the Teachers College Program in Mathematics. Photographs are drawn from the Teachers College archives and personal collections.

This issue honors Dr. Alexander P. Karp, an Associate Professor in the Program in Mathematics at Teachers College. A native of St. Petersburg, Russia who is the author of more than one hundred publications including textbooks used throughout Russia, Professor Karp represents Teachers College at meetings and conferences throughout the world as well as through his role as managing editor of the *International Journal for the History of Mathematic Education*.

Former Teachers College Professor and Mathematics Education Chair, Howard Franklin Fehr, was among the most influential mathematics educators of his era. Through his many international contacts, he was the organizer of conferences, projects, and publications including the Congresses of Mathematics Education, a seminal conference on Needed Research in the field, and curriculum initiatives including the Secondary School Mathematics Curriculum Improvement Study.

**Aims and Scope**

The *JMETC* is a re-creation of an earlier publication by the Teachers College Columbia University Program in Mathematics. As a peer-reviewed, semi-annual journal, it is intended to provide dissemination opportunities for writers of practice-based or research contributions to the general field of mathematics education. Each issue of the *JMETC* will focus upon an educational theme. Themes planned for the 2011 issues are: *Mathematics Curriculum* and *Technology*. *JMETC* readers are educators from pre K-12 through college and university levels, and from many different disciplines and job positions—teachers, principals, superintendents, professors of education, and other leaders in education. Articles to appear in the *JMETC* include research reports, commentaries on practice, historical analyses and responses to issues and recommendations of professional interest.

**Manuscript Submission**

*JMETC* seeks conversational manuscripts (2,000-2,500 words in length) that are insightful and helpful to mathematics educators. Articles should contain fresh information, possibly research-based, that gives practical guidance readers can use to improve practice. Examples from classroom experience are encouraged. Articles must not have been accepted for publication elsewhere. To keep the submission and review process as efficient as possible, all manuscripts may be submitted electronically at [www.tc.edu/jmetc](http://www.tc.edu/jmetc).

**Abstract and keywords.** All manuscripts must include an abstract with keywords. Abstracts describing the essence of the manuscript should not exceed 150 words. Authors should select keywords from the menu on the manuscript submission system so that readers can search for the article after it is published. All inquiries and materials should be submitted to Ms. Krystle Hecker at P.O. Box 210, Teachers College Columbia University, 525 W. 120<sup>th</sup> St., New York, NY 10027 or at [JMETC@tc.columbia.edu](mailto:JMETC@tc.columbia.edu)

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## *Journal of Mathematics Education at Teachers College*

### **Call for Papers**

The “theme” of the spring issue of the *Journal of Mathematics Education at Teachers College* will be *Mathematics Curriculum*. This “call for papers” is an invitation to mathematics education professionals, especially Teachers College students, alumni and friends, to submit articles of approximately 2000-2500 words describing research, experiments, projects, innovations, or practices related to mathematics curriculum. Articles should be submitted to Ms. Krystle Hecker at [jmetc@tc.edu](mailto:jmetc@tc.edu) by January 1, 2011. The spring issue’s guest editor, Nicholas Wasserman, will send contributed articles to editorial panels for “blind review.” Reviews will be completed by February 1, 2011, and final drafts of selected papers are to be submitted by March 1, 2011. Publication is expected in mid-April, 2011.

### **Call for Volunteers**

This *Call for Volunteers* is an invitation to mathematics educators with experience in reading/writing professional papers to join the editorial/review panels for the spring 2011 and subsequent issues of *JMETC*. Reviewers are expected to complete assigned reviews no later than 3 weeks from receipt of the blind manuscripts in order to expedite the publication process. Reviewers are responsible for editorial suggestions, fact and citations review, and identification of similar works that may be helpful to contributors whose submissions seem appropriate for publication. Neither authors’ nor reviewers’ names and affiliations will be shared; however, editors’/reviewers’ comments may be sent to contributors of manuscripts to guide further submissions without identifying the editor/reviewer.

If you wish to be considered for review assignments, please request a *Reviewer Information Form*. Return the completed form to Ms. Krystle Hecker at [jmetc@tc.edu](mailto:jmetc@tc.edu) or Teachers College Columbia University, 525 W 120th St., Box 210, New York, NY 10027.

### **Looking Ahead**

Anticipated themes for future issues are:

Spring 2011	Curriculum
Fall 2011	Technology
Spring 2012	Evaluation
Fall 2012	Equity
Spring 2013	Leadership
Fall 2013	Modeling
Spring 2014	Teaching Aids
Fall 2014	Special Students

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## NOTES FROM STUDY TOURS

The Program in Mathematics inaugurated its Study Tour activity in 1995 when eight students accompanied Professor Vogeli to Kathmandu and Pokhara, Nepal to live and work with Peace Corps volunteers in rural village schools. Since this first study tour, the Program has sponsored tours to twenty-five nations, including:

Argentina	Guatemala	Russia
Australia	Hungary	Singapore
Austria	Iceland	Tibet
Cambodia	India	Tanzania
Chile	Japan	Uganda
China	Kenya	United Kingdom
Costa Rica	Korea	Vietnam
Czech Republic	Mexico	
Finland	Nepal	

Study Tours are organized with the cooperation of local in-country leaders and administrators, many of whom are Teachers College graduates or colleagues of the Program's faculty. School visits, conferences, and conversations with foreign counterparts expand Study Tour participants' knowledge of mathematics education abroad and provide opportunities to experience the culture, landscape, and lifestyle of host countries to enhance Tour participants' worldview. Not infrequently, Study Tour experiences and contacts have led to career redirection embracing international events and collaborations.

Study Tour organizers and Tour leaders among the faculty of the Program in Mathematics encourage participants to record their experiences in writing and photographs. This section of the fall-winter 2010 issue of the *Journal of Mathematics Education at Teachers College* is comprised of samples of the journal entries prepared by Study Tour participants.

The Study Tour activity provided by the Program in Mathematics at Teachers College is unique in the panorama of graduate study opportunities in the United States and around the world. Study Tours continue Teachers College's tradition as an internationally oriented graduate school of education and the Program in Mathematics' commitment to the preparation of world leaders in the field of mathematics and its teaching.

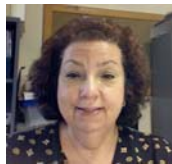
Dr. Stuart Weinberg  
Senior Lecturer  
Coordinator of Field Activities

## Finland and Iceland, 2005

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Robin Kalder

Western Connecticut State University



In Finland our host at the University of Jyväskylä was Pekka Kupari. In our first discussion with him, we discovered that teacher-training programs in Finland are highly selective, as generally only the top 10% of applicants are accepted, and not all of these pre-service teachers are successful in completing the programs. As a result, Finnish society has a high level of respect for teachers, and schools are given a wide berth in academic decisions.

We were also fortunate enough to meet with Andreas Schleicher, who is the Head of the Indicators and Analysis Division of the Directorate for Education in Finland. He presented his findings about the implications of the results of Finland's performance on PISA. He reinforced the fact that teachers are highly respected professionals in Finland, and also indicated that the average cost to educate each student is lower than in many countries. A very interesting finding was that there were high and consistent standards among schools, as average student performance was generally unrelated to the particular school in which the student was enrolled.

After this wonderful introduction to Finnish schools, we had the pleasure of visiting elementary and secondary students in their academic settings, and to speak extensively with their teachers. We found the students to be very focused and driven toward excellence, and quite independent from parents in their academic choices. Clearly, "helicopter parents" do not exist in Finland. Teachers spoke of the high level of respect they are afforded and the autonomy their schools have in curricula decisions. Discussions about diversity were particularly interesting. While the Finnish educators discussed their focus on meeting the needs of a diverse student population, it was clear that "diversity" is a relative term. Simple observations of the student population highlighted that the spread of academic diversity was small and the cultural differences among students were far less than in the United States.

Our time in Iceland was hosted by Inga Dora Sigfusdottir at Reykjavik University and later at her home. Time mostly was spent on informal discussions about mathematics education in Iceland with members of Flötur, the Association of Icelandic Mathematics Teachers. Among the members that we met with were primary, secondary, college and university mathematics teachers. The hospitality and openness of these teachers made conversation flow easily, and I was able to ask about the fact that female students in Iceland outperformed male

students on the latest PISA. The consensus response was that the explanation was that the boys in Iceland were not as academically minded as the females. The majority of job prospects for males do not rely heavily on academic accomplishments.

Educational tours like this highlight the importance for mathematics educators in the United States to learn about education systems throughout the world. Observations and discussions in international settings give invaluable insight about pedagogical philosophies and practices to all participants. They provide us with the opportunity to analyze our similarities and differences in an effort to incorporate successful techniques and philosophies from other cultures into our educational system.

## Korea, November 2006

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Chi Vu

NYC Social Service



I came into this Study Tour from the perspective of comparative education. I knew two things about the Korean education system: first, the country has the highest percentage of children in private after-school tutoring, or "shadow education," in the world, and second, Korea's eighth grade students scored among the top three in the world in the 2003 Trends in International Mathematics and Science Study (TIMSS)—a respected measure of student achievement in mathematics and science across nations. What I wanted to find out on the school visits was how students and teachers felt about the expectations for high achievement: Do they buckle under pressure? Do they participate in extracurricular activities? What is the connection between doing well in school and having success later on in life in Korea? What do mathematics teachers in Korea think of the way American mathematics classes emphasize more "progressive" teaching methods?

*The Primary and Secondary Schools: Yanggam Elementary and Middle School, Hyomyung, Yushin, and Seoul Science High Schools*

Several features stood out during our visits to the elementary, middle, and high schools in Suwon and Seoul. The first was technology: several schools integrated technology to facilitate instruction in all subjects and grades, and the technology did not seem like novelties for use only during special occasions. Instead, the ease with which the teachers used these tools made me wonder if something similar could be achieved in classrooms in the



## NOTES FROM STUDY TOURS

United States. Students who are visual learners can benefit from the use of technological tools such as computer-generated diagrams and video-based lessons.

The second outstanding trait I noticed at these schools was the emphasis on extracurricular activities, particularly on building character. Schools such as Yanggam Elementary School in Suwon, and the two religious high schools in Seoul, Hyomyung and Yushin, all actively encouraged their students to engage in aesthetic development and physical fitness. Evidence of students' artistic achievements abounded: artwork lined the walls, students learned to pour tea at a young age, and musical performances demonstrated that they are not academic drones. I emphasize this notion of non-academic extracurricular activities because there is a popular belief that Korean schools do not foster achievement outside of traditional academic subjects. While Korean society does emphasize academics, it does not do so to the exclusion of other enriching activities. Schools do their part to help children grow in mind and body, to benefit both themselves and their communities.



Seoul Science High School is truly exceptional, admitting only the most gifted students in Korea. Many students remain on campus even for weekends, rather than returning home, so they may focus on their studies. As is the case at other schools in Korea, teachers work at Seoul Science for a fixed number of years and then move on to another school so that the faculty is constantly “refreshed.” It is sometimes the case that teachers feel inadequate among their brilliant students.

We learned more about the subject of teaching as a profession—its problems and joys—when we visited the three universities on our tour.

### *The Universities: Ajou, KyungHee, Seoul National*

At the universities, the themes centered on the connection between how well individuals performed in secondary education and how they performed in the tertiary level and beyond. The professors here pointed out several problematic features of Korean education, the most

prominent being the intense pressure children feel to succeed academically. The professors at KyungHee observed that once some students enter a prestigious university, they are too “burned out” and are unable to work creatively.



Something that Dr. Choi said at Seoul National about job prospects in Korea sounded similar to what I'd read about for the US. He said that a higher percentage of the population in Korea now has a college diploma, so having one no longer guarantees a secure job. Thus, universities are getting more selective, and students must prepare even more to obtain a place in a good college. Knowing this, I had to think about Korea's efforts toward equality in delivering a high-quality education for all its students. If you push the population to achieve on a higher and higher level, does it reach a point when all that studying and competition to surpass others becomes harmful?

### *Final Thoughts*

The schools we visited in Korea offered us many different themes to think about: gender—within student populations and within the ranks of teachers; equality in terms of access; and the profession of teaching in a culture that values academic success. There are many advancements and privileges that Korea's education system has achieved for its students, and the system seems ideal, and perhaps we are tempted to apply some of the methods used to such great success by Korean mathematics teachers to our classrooms in the US. Upon further reflection, and after the discussions that our group has had on the purpose of standardized testing and the feasibility of transferring pedagogy from Korea to the US in the teaching of mathematics, I would agree that the two countries are too different simply to transfer teaching methods that have worked in one country to use in the other.

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We also have not seen everything that is relevant, either. After observing many positive features of the Korean schooling system, I have more questions—most especially about how individuals who are not academically inclined do in schools. I'd like to know more about how students with disabilities and special needs are accommodated. Korea seems like a teacher's dream come true, but are there difficulties in discipline with these children? Are Western ideas—about individualism, constructivism in mathematics education, etc.—having an effect on how Koreans approach schooling? More pressingly, what does the extent of “shadow education” say about the adequacy—or inadequacies—of public education in Korea? Perhaps more detailed research is needed to get to the heart of these issues, but what I *have* seen of Korean education, especially regarding the use of technology and the resources and funding that go into each student, points to some possible steps that the American educational system could take to serve its teachers and students better.

### China, March 2007

Julia Henderson

Klingenstein Center, Teachers College



I came away from our meetings at different schools and universities with three overarching observations: China's solid commitment to education, China's radical curricular reforms, and China's interest to emulate America's pedagogy when it comes to innovation and flexibility.

First, China has a very strong cultural commitment to education, particularly to rigorous mathematics and science education. The commitment to education became clear in the hierarchical way schools were ranked in their cities and regions and in the way schools boasted about high placements in international tests such as TIMSS and

Olympiad mathematics competitions. Confucius was often quoted during our visits—illustrating that “the importance of study” is deeply rooted in Chinese culture and consciousness. For example, during the site visit to the secondary school affiliated with Ren Min University, the class we observed (like others) started with the students bowing to the teacher—a millennia-old tradition of respect and reverence to teachers. In this same classroom, the seventh grade mathematics lesson left my mathematics colleagues puzzled with its high order thinking and speedy operations!

Another example of science and mathematics rigor was provided when we visited the Key High School outside of Shanghai. The school proudly displayed its numerous awards and medals from the Intel International Science and Engineering Fairs, and our student guides showed us the sophisticated science exhibition space that has received international attention. These talented students shared with us their independent study projects, which showed a highly sophisticated level of mathematics and science inquiry. For example, one student studied how the function  $y=ax^2$  changes shape and presented it graphically. As a social scientist, I have no idea what that means, but I take my lead about its sophistication from the raised eyebrows of approval of my mathematics colleagues! Content aside, as an educator, it was clear that students in this select group were highly motivated and would benefit greatly from the problem-based learning (PBL) independent study, which encourages students to pursue their own interests and lines of inquiry.



Second, Chinese educational leaders, teachers, and heads of school are determined to improve teaching and learning by stressing teacher development, and application of knowledge and innovation in the classroom. At the East China Normal University meeting with doctoral and masters degree students in mathematics education, most of the graduate students had been teachers prior to starting the program. At the university-hosted symposium, we learned

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that China has a teacher training model that pairs a new teacher with a mentor or master teacher for three consecutive years. This commitment to teacher development underscores the high value that is placed on the purposeful development of exemplary teachers, and perhaps too, the public recognition and status master teachers attain in Chinese society.

Professor Lee spoke about a new mathematics curriculum in the country that stresses process and explanations over simply getting the correct answer and pointed to more choice of national mathematics textbooks that challenge students to “learn to learn.” Professor Lee also spoke about changes to test content, where mathematics applications and problem solving are becoming more commonplace. This is a significant shift away from a long tradition of rigid classroom teaching that stresses preparation for examinations, and toward a more student-oriented approach that emphasizes inquiry.

Third, the Chinese government is loosening administrative control away from the traditional emphasis on test-centered (*gaokao*) conformity to a more Western approach to curriculum that emphasizes inquiry methods, critical thinking, and choice in the curriculum. A good example of this change was at the October First School in Beijing. The principal, Mr. Lee, described it as “a special school,” but not only because it is the largest school in Beijing with the biggest campus—serving 5600 students on a construction area of 104,000 square meters—but because it is operated as a private school. This high functioning school offered insight into a changing educational landscape in China that is bolstered by a consumer-led economy driven by choice. In fact, the school’s education philosophy on the website reads, “Reform. Choice. Development. Harmony.” This element of choice was evident in the structure of the school itself right down to the choices in curricula that offered multiple elective courses, from martial arts to floral design.

Another example of this desired change to curricular approaches to teaching and learning was a question that was posed at this school’s symposium by Dr. Wong Fey, one of the master teachers whose class we observed. In essence, he asked why students in China have far more complex content and course knowledge than American students, but American students exhibit far more creativity, innovation, flexibility, and leadership—skills said to be necessary for a global marketplace. The Chinese educators and leaders we met recognized that this was a problem and are seeking answers. The very fact that they were seeking answers from us as to how to be more innovative was very telling in itself!

Finally, while America is trying to impose more control over a decentralized system through education reforms that promote standardized testing as a measure of accountability, it seems interesting to me and rather ironic that China is doing the exact opposite. Chinese educators greatly admire American research and innovation, and our

delegation admired the high standards of science and mathematics we observed.

I came away from the Study Tour with a much richer understanding of how the different histories and traditions of China and America have played out in curricular arenas. There is a great deal to learn from China and its educators, and I hope to foster connections in the future as part of my teaching practice and administrative career.

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## Nepal and Tibet, August 2007

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Mikyong Cho

Fordham Leadership Academy



Tour participants gathered at JFK Airport and waited anxiously for the flight to an exotic region of the world few have an opportunity to visit ...

In Nepal, we visited Kirtipur, an ancient town 5 km southwest of Kathmandu. There, we visited a public elementary school and Tribhuvan University. The school had earthen floors, breaks in the walls, and rocks upon the roof to secure it during typhoons. To enter the classroom, we stepped over a barrier that was in place to prevent flood waters from flowing in. Only desks, chairs, and a chalkboard were in the classroom. Tribhuvan University is the oldest and largest in Nepal. From the University’s Central Library, we walked to the Department of Mathematics, where I learned from a mathematics professor that tuition is \$70 per semester.

Kathmandu University is a public institution located in the mountainous terrain of Dhulikhel Municipality. The University has exchange programs with some US universities. From the University, we traveled through verdant green vegetation—first by bus and then by foot along a winding path that, along the way, we shared with some goats—to a public primary school located on a plateau overlooking a valley. The classrooms were as spare as in Kirtipur and at different levels depending on the natural terrain. As we waited by the school, the children appeared below and began to ascend the hillside toward us. Some were barefoot. The first students in line carried individual flowers, which, one by one, they handed to

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Professor Weinberg until they comprised a colorful bouquet. TC tour participants were served local pears, and then we presented the school with notebooks and pencils before all assembled as a group to be photographed. It was the end of the day; so some children walked back to the main road with us, where we boarded the bus.



The pagoda style Pashupatinath Hindu Temple was among the many temples and stupas we visited in Nepal. Located on the banks of the Bagmati River, it is a UNESCO World Heritage Site and considered one of the most important for Hindu pilgrimages. There, from the opposite riverbank, we witnessed the ongoing cremation rituals in which wood, bamboo, and human remains are consumed by fire, after which the ashes are sprinkled into the waters of the Bagmati River, which flows into the sacred Ganges in India.

Near Durbar Square is the Kumari Chowk, which houses a young girl, chosen to become the human incarnation of the Hindu mother goddess, Durga. She is worshipped during religious festivals and not allowed to touch the ground. Throughout the day, she can be viewed by the devout and the curious as she looks out from her window. At about sixteen years of age, she is “retired” and sent far away where she is not known, for no man would marry someone so sacred.

On the last morning in Nepal, many of us chose to board a small plane and fly past Mount Everest – it is a sight I will never forget. Later that day, it was off to Tibet and a whole new world.



On the way to Lhasa from the Gongar airport, we stopped by a public primary school. No students were present, but two teachers came from their rooms to greet us. We were told that their salaries were meager but that they were satisfied with the amount. The teachers escorted us to their modest classrooms. We were fascinated with the Chinese characters and Tibetan script meticulously written on the chalkboard. One of the problems teachers face is that instruction is in Chinese, but the native language is Tibetan. Thus, parent involvement in a child’s education is limited by the language barrier.

Two of the palaces we visited are UNESCO World Heritage Sites: Potala Palace, the chief residence of the Dalai Lama until the 14th Dalai Lama and now a museum; and Norbulingka Palace, the summer palace of the Dalai Lamas (8th to 14th).

At one time, Drepung Monastery was the world’s largest and richest monastery, with 10,000 monks. Currently, there are only 400. Sera Monastery is a teaching monastery and one of three Gelugpa universities in Tibet. It is also the birth place of Tibetan medicine. Here, young novices learn scriptures. One afternoon in a large courtyard, we observed the monks engage each other in animated and boisterous debate. A resounding hand clap from their master was the reward for a correct response. It was fascinating to witness these very religious Tibetans, their way of life and religion.

## Southeast Asia, May 2008

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Edward Ham  
Bakersfield College



*Singapore*

In the Trends in International Mathematics and Science Study (TIMSS) many attribute Singapore’s top level performance in mathematics to the Singapore mathematics curriculum framework (SMCF) that emphasizes mathematical problem solving. The curriculum is divided into three strands: instructional programs, core curricular programs, and character development. The instructional programs focus on academics and require students to take courses in mathematics, sciences, and the humanities. The core curricular programs focus on extracurricular activities outside of the classroom. Schools also focus on character development with the goal of “developing proper citizens.” One way to foster character development is the implementation of the honor code in which students take examinations without supervision by teachers. The idea is to develop students as well-rounded citizens who are

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academically strong, fully involved in society, and have strong character. In Singapore, I was able to observe both Northland Primary School and Yushin Junior College.

Walking around Northland Primary School, one can observe the emphasis placed on mathematics just by looking at school hallways. Number facts and mathematics games are scattered throughout the school. The mathematics department created a Making Mathematics Meaningful Center to differentiate instruction. The aim of the center is to complement classroom instruction by providing topics in a variety of ways throughout several stations. At the center, students were measuring angles using protractors, building irregular polygons on GeoBoards and calculating perimeter, posing their own word problems and using computers to review and reinforce geometry concepts.

The mathematics department developed a curriculum that incorporated ideas such as Journal Writing, Hands-On Lessons, Weak Item Analysis, Scaffolding, Math Trails, Games, and CODER (Clone, Opposite, Data Builder, Extension, and Reverse). While working collaboratively, students were engaged in a CODER lesson in which they begin with word problems and modify them by changing key words. Students solve the problems to ensure that they make sense, thus enhancing their acumen. The teachers select several to be included in the school's own Thinkerbell book. Thumbing through the book, one notices the high level of mathematics achievement from elementary students.



Yushin Junior College is attended by high-school age students fast-tracked for universities. Interestingly, these courses bear similarities to those in the United States because of the more teacher-centered lessons. When asked about the shift in teaching styles from elementary to junior college, administrators replied that because of an emphasis on analytical and problem solving skills in elementary grades, older students are able to process material independently.



### *Vietnam*

In 1979, Vietnam initiated education reform designed to make education more relevant to the nation's economic and social needs. During the trip to Vietnam, schools in both Hanoi and Ho Chi Minh City were observed.

At the Mathematics and Science Gifted High School in Hanoi, we participated in a roundtable discussion with participants in the International Mathematics Olympiads. The students informed us that they spend six hours of the school day doing mathematics and science, while devoting only a few hours to the humanities. During the discussion, student work notebooks were available for us to peruse, and each notebook was meticulous in organization with every step of work shown. There was intense competition among students, as they were all competing for several scholarships to top universities in England.

### *Cambodia*

The next destination was a local high school in Siem Reap, Cambodia on a Saturday afternoon. After the abolishment of education in 1975 by the Khmer Rouge, the new Cambodian government had to reconstruct the entire education system in 1979, guaranteeing the universal right to basic quality education. Even though they had the most basic classroom with only desks and chairs and a chalkboard, students were attentive and motivated to learn.

## NOTES FROM STUDY TOURS

The topic was properties of logarithms. The teacher called on students to stand and recite the properties of logarithms. Then the teacher modeled a simple example on the board and gave students a few sample exercises to work on independently. Students were asked to go to the board and solve the problems. Several problems had multiple solutions, which the teacher explained. Next, students worked collaboratively in groups on three difficult problems combining several properties of logarithms. Even with the poor conditions of the school, the knowledge of the students was impressive. There were no classroom management problems, and students followed classroom protocol. At first, the class appeared to be quite traditional, focusing on lecture, memorizing and reciting properties, and routine exercise. But as the class progressed, elements of constructivism appeared in the form of cooperative learning, scaffolding, and the interaction between teacher and students.

### Budapest and Prague, 2008

Elizabeth Frazier

Chadwick School, Southern California



I read about, registered, and departed for the study tour to Budapest and Prague without knowing very much at all about the countries I was about to visit. I ended up learning a lot.

I was most profoundly affected by our visit to the Taborska Elementary and Middle School. In my journal, I noted how I loved that the school was in a busy, urban part of Prague, but its interior felt like an oasis. It was light-filled and peaceful, and quiet, except for the occasional murmurs and giggles coming from classrooms, or the upbeat songs that played over the intercom to mark the ends and beginnings of class periods.

I noted and loved that Taborska's hallways were adorned with student artwork (in real frames—sometimes even behind glass!) and photographs of students and faculty at school events. I liked the way the classrooms themselves were arranged and decorated. Everything in each classroom appeared to be scaled to the size of the students the space was intended to accommodate. Student projects were featured prominently alongside the teacher-made posters on topics in mathematics. There was a ping-pong table dominating a landing in the stairwell, as well as flags that represented the home countries of every student at the school.

Nothing about Taborska felt sterile or institutional. It had a real, palpable personality, and it felt like a place in which students genuinely could enjoy spending time. Even the dining hall was decorated, with papier-mache chili

peppers that elementary students had created to celebrate “Hungarian week.” The school looks like a place for young people to feel comfortable and eager to learn.



To me, Taborska seemed to be doing everything right. Its spaces were warm and safe and inviting. As far as I could tell, the students were engaged, well-behaved, and happy to be there. The teachers and administrators walked around with smiles on their faces, and they stopped in their tracks to talk to students.

The teacher I observed in the mathematics class was quiet but commanding. There weren't any classroom management problems; her students were paying attention and on task. The teacher changed modes and thought on her feet. After going over homework problems on the board, she broke the class into groups and had them play a domino game. When one student clearly struggled, the teacher quickly put a challenging problem on the board to occupy the other students and keep them from staring at their struggling classmate. Even though she looked young (which I struggle with almost daily as a young teacher, with parents who think I look younger than their children), the teacher was friendly without being giggly, and serious without being cold. Her class was an absolute pleasure to observe.



I walked away from our visit there thinking that every school should look, feel and sound the way it did. I left thinking about how accommodating and kind the teachers were to us despite the language barrier. I since have often

## NOTES FROM STUDY TOURS

thought of the way the teacher I observed had a quiet command of her classroom, and I've tried to mimic her approach.

I do think there are real lessons to be learned from places like Taborska, if only on a personal level. I was affected personally by the school's atmosphere and warmth, both of which are things I'd like to recreate (if only abstractly) in my own classroom and my own experiences as a teacher. I don't teach little ones, but I still want my students to know that I'm there for them and that they are the focal point of the school and of my daily work as their teacher. I want my students to know that I value their creativity and their work. I want them to feel safe and comfortable and at home in school, and I'm willing to recreate and imitate as many of Taborska's features as I can.



I'm so grateful that I went on the Study Tour not knowing exactly what to expect. I often find myself telling other people that I learn as much—if not more—on study tours than I do in any on-campus course. I will certainly remember the time I spent sitting in a classroom in Taborska. I think it is memories like these that make me a more interesting (and hopefully more effective) teacher.

### Guatemala, 2007; 2008 & 2009

Elida Wylie

Education Testing Service (ETS)



The experience of studying Spanish in Antigua, Guatemala on the Study Tour organized by the Program in Mathematics at Teachers College is an opportunity that no member of the Teachers College community should miss. The recognition that our society is more diverse, the expansion of global influences on our economy, and the knowledge that more than 60% of the Western hemisphere speaks Spanish all make the acquisition of some familiarity with the language increasingly important. Having the total immersion experience offered by the tour enhances the ability to gain that familiarity.

During the Study Tour, students work one-on-one with a teacher for 60 hours. At the highly respected Christian Spanish Academy, all teachers seem to possess incredible pedagogical flexibility that typically results in a feeling of complete amazement at how quickly the time passes and how rapidly you progress in learning the language. They have taught individuals from all over the world and consequently have very interesting experiences to share; moreover, they provide distinctive perspectives on the country's traditions and politics.

In addition to the classes, students participate in excursions. The staff in De Pe a Pa Tours, located in the Academy, have prearranged opportunities that expose students to more of the Guatemalan culture and history as well as opportunities for more adventurous souls, such as climbing the Picaya volcano. As an aside, renting the walking stick from the children prior to beginning the climb was one of my best investments! No matter how great the temptation is to explore the many aspects of the country, I must admit to feeling the most euphoria the day I visited the Mayan Spa they recommended; it was truly a delightful indulgence.

From the moment you arrive in Antigua at the five-star hotel Hotel Casa Santo Domingo, colorful structures along the cobble-stoned streets, beautiful varied plants, and views of the three magnificent volcanoes in the distance insure that you know you are about to have a wonderfully unique experience. Needless to say, the accommodations are exquisite. Even now, years later, for a brief moment of serenity, I return mentally to the many evenings I spent relaxing in one of the hotel's hot tubs, enjoying the view of the stars.

The variety of restaurant options in Antigua is also something worthy of notice. To experience the local cuisine, Las Palmas is one of my favorites. Given that the exchange rate is so favorable for US dollars, one easily can enjoy a fabulous meal with great music in a superb setting for under \$30. The most memorable of these high end restaurants is the Panza Verde, perhaps the best restaurant in all of Central America. There also are many very good inexpensive restaurants that easily are accessible along with ice cream shops and cafes offering the most tasty treats and richest coffee. There are many options for practicing Spanish by shopping for local crafts and obtaining souvenirs.



## NOTES FROM STUDY TOURS



The architecture is beautiful, and there is a central park near the hotel where tourists and locals congregate to enjoy the climate and occasional artistic performances. Most exceptional of all the features of Antigua is the warmth of the people. Passers-by generally share some type of greeting, and people typically are willing to help you should you get turned around in your travels. In general, the Tour offers unrivaled cultural exchange experiences and makes doing Spanish language homework feel like a normal vacation activity.

### Argentina, 2009

#### Margaret Rizon

Rita Gold Early Childhood Center, Teachers College



In March, 2009, I joined Teachers College graduate students on a study tour to Buenos Aires, Argentina. Our group was led by Professor Neil Grabois, who was dependable, reliable, and just as enthusiastic as we all were. The local tour was organized and led by Melina Furman, an alumna of TC's MST department. She now teaches at Universidad de San Andrés, a small private institution (approximately 700 undergraduate and 500 graduate students) located in the town of Victoria on the shores of the Rio de la Plata in Greater Buenos Aires.

From the moment we arrived at the airport to our departure back to New York, every detail was carefully and thoughtfully planned. During our stay, we visited a variety of schools—elementary and high school, public and private. The head and several teacher educators of the School of Education at Universidad de San Andrés talked to us about the Argentine public school system—particularly how the daily lives of schoolchildren and their families are affected, for better or for worse, by militant teachers' unions. Through the University, we visited a public elementary school in La Cava, a slum area near its campus. This school is a partner school of the University's program, "Schools for the Future."

Also, we visited Instituto Pestalozzi in the Belgrano neighborhood. Instituto Pestalozzi historically is a school for German immigrants, but now is a community private school that still teaches the German language. The high school has an exchange program with schools in Germany.

During a visit to a private high school, Colegio de la Ciudad, also in the Belgrano neighborhood, the school principal/owner talked to us about his school and why people opt out of the public school system in Buenos Aires. One reason is the unpredictable number of school days due to teacher union strikes. These strikes can last for several weeks, leaving parents with the dilemma of where their children would be, should schools be closed.



In addition to a taste of the different types of schools in Buenos Aires, the school visits gave us a glimpse of the socio-economic stratification of the urban area. During the visits, we had opportunities to observe ongoing classes – different grade levels and subjects such as mathematics, English, science. Within each school, we had choices of classrooms and question-and-answer sessions with administrators, teachers, and students. They were very welcoming of us.

When not visiting schools, we had guided walking tours in different neighborhoods—Palermo, La Boca, and Recoleta (where we stayed)—and visited several city landmarks. We had dinner in Puerto Madera, Las Nazarenas Steak House, and a Patagonian restaurant. We went to the Sunday flea market in San Telmo. We were fortunate to have tango lessons with the tango king, Juan Carlos Copes, and his daughter, who is also a professional tango dancer. We even watched a tango show (with Juan Carlos Copes in it!) over dinner at Esquina Carlos Gardel, the city's premier tango house, named after the famous singer.

This Study Tour offered a variety of opportunities to learn about the culture and education system of Buenos Aires. It left us with many things to think about—particularly about education, socio-economic equity, and the world we are in.



## Australia, Summer 2009

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Frank Cowie  
Teachers College



The Study Tour was organized and led by Max Stephens, Professor of Mathematics Education at the University of Melbourne and Senior Research Fellow for the State of Victoria Department of Education. During our several days in Sydney, we visited the University of Sydney and a nearby elementary school. We met several University mathematics professors, who provided an overview of the education system of New South Wales, followed by a student-led tour of the campus. We attended an undergraduate mathematics class one morning and participated in their discussion and group activities. At the elementary school, the principal and teachers were eager to answer whatever questions we had.

We traveled with Professor Stephens by ferry to Manly, one of Sydney's most popular Northern Beaches, to enjoy great views of the Sydney Opera House and the Sydney Harbour Bridge. We had a group dinner at Darling Harbour, and some of us attended a performance at the Sydney Opera House. During free time, we explored the city on our own.

Our full week in Melbourne was packed with school visits and numerous optional sightseeing trips. We met with Professor Stephens's colleagues at the University of Melbourne, where we talked about the school system of Victoria, the state in which Melbourne is located. We participated in discussions and group activities in a graduate class on early intervention. At a meeting at the Department of Education, we learned about curriculum, evaluation, and assessments from the head of Policy and Research.



The first school visit was at University High School, which specializes in science and is affiliated with the University of Melbourne. We observed students working on their genetic projects in the laboratory. Later, we visited a public elementary school with many first-generation

immigrants from Somalia and other African nations. Grade 4 & 5 children, whose classroom we visited, prepared a PowerPoint presentation to welcome us. Children were assigned to each of us for a tour of their school. We spent a full day at a school in Merinda Park, about an hour train ride from downtown Melbourne. The school specializes in technology and has its own local radio station. A ten-minute morning show hosted by sixth grade students is broadcast daily around the school. Also, the school features movie festivals. At an all-girls' elementary and high school in the Toorak neighborhood, we observed their Medieval Day, in which students and teachers wore period costumes.

During these visits, we had warm receptions by principals, teachers, students, and school administrators. We sat in classes and talked to many teachers and students. They eagerly showed us their campuses and discussed their programs. Aside from school visits, we watched an Australian football match at the Melbourne Cricket Ground and took out-of-town guided trips to see penguins, kangaroos, wallabies, and other animals unique to Australia. We had dinners together and watched a symphony performance by the Melbourne University Orchestra. Like other study tours, I left the country with so many things to think about—education, culture, and my own classroom practice.

## Russia, November 2009

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Ronny Kwan Eu Leong  
University of Malaya Fellow



The observations in Russia were diverse. We visited elementary schools, high schools, universities, and specialized schools. Schools with advanced study in mathematics began in Russia during the end of the 1950s and early 1960s, a result of reforms in education to produce students with specialized abilities. This was the beginning of gifted education in Russia.

We observed an elementary mathematics classroom in School #207, a public school in St. Petersburg, that specialized in the advanced teaching of English. Class began with students solving problems using mental mathematics; pencils and paper were not allowed and students had to explain their answers orally. Questions ranged from basic geometry to basic computations, but the goal was to identify a specific trick or manipulation necessary to make the computations simpler. According to the teacher, all students in grades 5 and 6 spend the first 5-10 minutes of every class working on mental mathematics.

## NOTES FROM STUDY TOURS



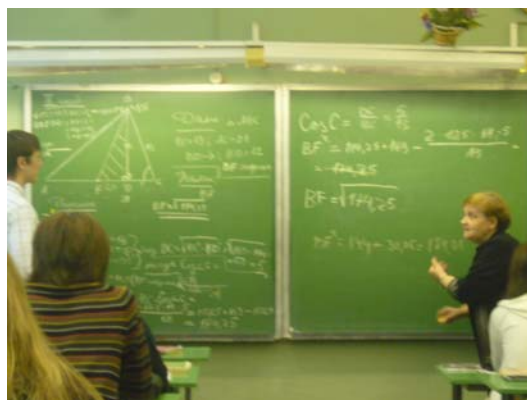
In both St. Petersburg and Moscow, we observed high school algebra classes at three different schools (including one school that enrolled gifted mathematics students). Interestingly enough, each class was covering the same topic: radicals; however, the instruction was different at each school. In School #207, students spent time solving ten radical problems. While students worked independently on the problems, other students were selected to go to the board. The teacher corrected the students at the board immediately, effectively creating a solution guide for the students to follow.



In School #222, students were given a handout of fully solved problems combining radicals and exponents in which several mistakes were made in each problem. Students worked independently to identify the mistakes and offered proper solutions to each problem. After some time, students were asked to answer the questions orally. In School #30, each student was given a worksheet with several tasks in which the teacher and students worked together orally. A common theme among the different algebra classes was that the discussion was teacher-centered.

The most interesting class was an 11th grade Geometry class in School #222. The entire period was devoted to going over *one* homework problem about an isosceles trapezoid, but introducing different methods of attaining a solution. The teacher began by asking a student to solve the problem on the board using the steps requested

from the textbook. While this was occurring, another student went to the board and put up another method of solving the problem. After discussing these solutions, yet another student was asked to present a different method on the board. Once the textbook solution and student solutions were discussed, the teacher introduced two more methods, bringing the total to *five* different methods of solving one problem.



Even though the Russian mathematics classroom primarily is traditional, there were elements of constructivism in the classroom. Every student was asked to participate in the classroom by going to the board and solving a problem. This was done quite efficiently as other students did not sit around watching the student in front, but were working independently on their own problems. Students also were called on to answer problems orally and give several explanations to individual questions. Even in a teacher-directed classroom, student participation was required and expected of all students.

While in Russia, a trip was also made to the Pedagogical University of St. Petersburg where several professors presented lectures on teacher preparation in Russia. Prospective elementary teachers are trained at pedagogical colleges while prospective secondary school teachers are trained in a state university or pedagogical university. In addition, to be a specialist in mathematics education, there are two models to choose from: the “specialty” route or “stream” route. The “specialty” model is a traditional model in which the curriculum specializes in mathematics and takes five years to complete. In the “stream” model, teachers usually major in two fields, such as physics and mathematics, and take six years to complete both majors, culminating in a teaching degree and a masters degree. Mathematics teachers in Russia are expected to have a solid grasp of the mathematics content.