

Report on my stay in the United States of America

March, 24th - April, 16th 2012



**Sarah Sennebogen
Didaktik der Biologie
Winzererstraße 45/II
80797 München**

Stay in the USA March, 24th – April, 16th Sarah Sennebogen

International Conference of the National Association for Research in Science Teaching (NARST)

The first destination was Indianapolis, Indiana, where the International Conference of the National Association for Research in Science Teaching (NARST) from March, 25th to March, 28th took place. The participation at the conference pursued different goals, which have been obtained: Visiting different presentations of other researchers working in my research field to get an insight on recent research projects and to identify overlaps and differences towards my project. Furthermore, the conferences offered the opportunity to meet already known international researches as well as to get to meet new researchers and to socialize. The third aim of my participation at the conference was to present my own research project and to get feedback from other international researchers.

Strand 4: Science Teaching--Middle and High School (Grades 5-12): Characteristics and Strategies

Inquiry Based Teaching and Learning
8:30am – 10:00am, Room 303

President:

Jodie Galosy, Knowles Science Teaching Foundation

Influences on Teachers' Capacities to use Educative Curriculum Materials as Intended

Sihan Xiao, University of California, Los Angeles, shxiao@ucla.edu

William A. Sandoval, University of California, Los Angeles

Cooperative Learning and Intergroup Competition in Biology Education

Sarah Sennebogen, University of Munich (LMU),

Sarah.Sennebogen@lrz.uni-muenchen.de

Birgit Jana Neuhaus, University of Munich (LMU)



Project-Based Teaching: Supporting Students in Making Connections

Heather J. Johnson, Vanderbilt University, heather.j.johnson@vanderbilt.edu

iCoach-Teacher Teams Professional Development: The Influence of Coach led Reflection, Practice Teaching, and Content Instruction on Middle School Teachers' Use of Inquiry Practices

Christine R. Lotter, University of South Carolina, lotter@mailbox.sc.edu

Jan Yow, University of South Carolina

Stay at the Teacher Preparation Program at Princeton University

Overview:

- Visiting three different high schools
- Visiting four different Colleges/Universities doing science teacher preparation
- Meeting with different people engaged on different levels of teacher preparation and science education in New Jersey
- Conducting a vocational training for in-service teachers

Visiting three different high schools

During this time I visited three different high schools in the area, to learn more about the school system in the US. The first high school was Trenton Central High School, with about 1800 students. Trenton itself is the capital of New Jersey with nearly 85.000 inhabitants. Despite that, it is a rather poor city, with a high diversity in population. This diversity is also reflected by the students at Trenton Central High School. Most of the students are black or hispanic, only a small percentage are white students. The amount of people with low income is, compared to other cities in New Jersey, rather high.

One of the main problems the school deals with is discipline. This topic was stressed by a math teacher in a conversation. This impression was intensified by the need for a security service on the hallway. The security service, e.g., takes care that the students are in class and not in the hallway during lessons. But because of the large school building with nearly 100 doors to the school ground, the students always find ways to hide.

The second school I've visited is Technology HS in Newark, a magnet school. Those schools are public schools, which have a specialized curriculum. The school has implemented a new approach in science teaching, "Physics first". Usually in US high schools biology and chemistry are taught before physics. In this school, the students attend physics classes before biology and chemistry. This approach involves a variety of changes: The idea is to teach physics with a problem-based approach. Therefore the students sit together in small groups around group tables. Furthermore, the teachers use smartboards to visualize the tasks for the students. Every teacher of one subject uses the same smartboard slides. After the students have solved the task they use "clickers" to answer the question. Therefore, they as well as the teacher get immediately feedback on what the right answer is and how many students knew it.

The third school was Princeton High School. Princeton is, compared to other towns in New Jersey, a rather wealthy town. The majority of inhabitants as well as students at Princeton High School are white (70% at the High School). Parents are strongly involved in the education of their children and are in close contact to teachers. Because of the rather wealthy township the school is well equipped. I observed four classes of student teachers (Latin, English, Social Science, History of the US). They used different approaches to teach: Two of the teachers used a teacher-centered teaching method, were as one teacher had had introduce a project-based approach in the lesson before my visit. Therefore the students worked in cooperative small groups on their task using the Internet.

Visiting four different Colleges/Universities doing science teacher preparation

During my stay I visited four different Colleges/Universities and got to know more about their teacher preparation programs.

Princeton University



At Princeton University the students have one major subject, e.g. molecular biology, chemistry, astrophysical science. Furthermore, they can get certificates of proficiency in about 40 different programs, like Dance, Finance, South Asian Studies, and many more. Among these there is also the possibility of doing a certificate in teacher preparation and getting a certificate of the State New Jersey to teach. Because of the wide range of programs in which those certificates can be purchased, only a few students are in the Teacher Preparation Program (TPP). Therefore, they do not offer subject-specific teacher preparation, but a program for each student, independent of the major subject and the subject they are going to teach. To get the teaching certificate students do a introductory practicum, attend courses in educational psychology, student learning and methods of teaching, a seminar on education and do student teaching for 12 weeks. They also have to do a final exam on content knowledge. All those seminars are connected with experiences in every day school life. Moreover, because Princeton University is not able to offer a subject-specific teacher preparation every student as an assigned teacher, who is a content instruction specialist and meets with the students 7 times to provide additional support and guidance in the development of subject specific knowledge and teaching skills.

One of the major challenges the Teacher Preparation Program faces is that lots of students rather work in commerce and earning more money than being teachers. This is facilitated by the great reputation students from an "Ivy League" College like Princeton University enjoy.

Rutgers University



Rutgers is the State University of New Jersey and offers more than 100 Bachelor and 100 Master Programs for 53.000 students.

The teacher program takes 5 years, in which they also complete a full major in a life science (if they want to become a biology teacher). In the first 4 years, they most of the time focus on their bachelor but attend courses in “Introduction to Education” and “Educational Psychology”. Their actually teacher education starts at the beginning of their fourth year when taking seminars on individual and cultural diversity in the classroom, biology & science, demonstration and technology in science teaching and teaching life science. To deepen their knowledge they do an additional year focusing on teacher preparation. A special feature at Rutgers University is, that they do not provide science teacher education, but subject specific teacher education. This approach is rare in the US. During my stay I visited Dr. E. Etkina, who is responsible for the education of physics teachers. She is not only engaged in teacher preparation but also focuses on keeping in touch with Alumni and to establish a network between Alumni students. In conversation with teachers being responsible for the hiring of science teachers at their high school, they told me that the quality of students graduating the physics teacher program at Rutgers is really high and that they are well prepared to teach.

The College of New Jersey



The College of New Jersey is, in comparison to Rutgers University, a rather small college with about 8,000 students. They offer the teacher certification for undergraduate students as well as graduate students at the School of Education. At TCNJ the teacher education not subject specific, but a preparation for science teachers having a major in biology, chemistry or physics. During their preparation students attend seminars in Learning and Development, Schools and Communities, Pedagogy, methods in science teaching, literacy in the inclusive classroom, historical and political context of schools. Graduate students can complete a Masters Degree in Educational Leadership, undergraduate students get their teaching certificate as well as their bachelor degree in the major subject.

Teacher College at Columbia University



The Teacher College at Columbia University is the oldest and largest school of education in the US. It is a graduate school. Therefore the students have already completed a bachelors degree in a subject before attending the Teacher College to become teachers. Moreover, the Teacher College has more than 1,400 doctoral students.

Because of the high numbers of students the Teacher College has the opportunity to offer subject

specific teacher education as well as level of education specific education (elementary school, middle school, high school).

Vocational training for in-service science teachers

One of my main goals for the stay at Princeton University was to conduct a vocational training for in-service science teachers using the teaching units I've developed for my dissertation project. The training took place on Wednesday, April, 11th, 4pm-6pm. Because of spring break only a few teachers were able to attend this training. It was set up in the scope of QUEST, which is the Program for Professional Development at the Teacher Preparation Program, Princeton University.

In the first 30 minutes I gave a short presentation to introduce the teaching method "Egg Race" and to present research results from my dissertation project. Afterwards the teachers were introduced to one of the teaching units, "Fermentation of yeast" and were invited to solve the Egg Race.



The third part of the vocational training offered the teachers the opportunity to take a closer look at the other five cooperative teaching units and to give feedback on provided sheets.



The provided feedback will be used to rework the teaching units. Furthermore a publication of one of the teaching units in cooperation with the Dr. Anne Catena from the TPP at Princeton University is planned.

Summarizing Comment:

Thank you so much for the financial support. It was a great experience to visit NARST Conference as well as the Teacher Preparation Program of Princeton University. It offered me the opportunity to get to know more about teacher preparation, schools in the US, current research in my field and to get feedback from in-service teachers on my teaching units.