With the new school year underway, it’s time for another edition of The Tall Times. We would like to take this opportunity to update you with the many events that have happened during the summer and thus far during this school year in our TaLL program. Read all about them in this issue. If you have any information that you would like to include in the newsletter, on our web site, or share with others in the Trenton District or at the College, please contact Michelle at ordini@tcnj.edu or 609-771-2295.

The TaLL team is pleased to announce that The Center for Mathematics, Science, and Technology (MST) at The College of New Jersey has been awarded $3.3 million for the New Jersey Teacher Quality Enhancement Recruitment (NJTQE-R) Grant Project. The project addresses the need to recruit and retain highly qualified teachers in high poverty, low achieving schools, particularly in the hard to staff areas of math and science. New Jersey’s TQE-R grant proposal outlines strategies across the continuum in its three strands: Recruitment for High Need Districts; Preparation for High Need District Teaching; and Induction and Professional Learning in High Need Districts. Working in partnership with The College of New Jersey and three high poverty, low-performing school districts (Trenton Public Schools, Pemberton Public Schools, and Vineland Public Schools), the New Jersey Department of Education will build on its strong teacher quality reform platform and the positive historical relationships of all partners involved in the project.

We would also like to thank everyone who participated in the TaLL Summer Math and Science Institutes in August! Twenty-two Math participants learned about Discrete Math, what Discrete Math is, where it is found in Connected Math, and how it can be supplemented to meet the standards. Thirty-one Science participants worked on fundamental concepts and content needed to teach science to their elementary students. On the fourth day of the workshop, 39 participants (a combination of Math and Science participants) took part in Gender Equity and Diversity Training and learned about mentoring. Overall, it was a great success!
What is Discrete Mathematics? According to the Webster’s Third New International Dictionary the adjective discrete can mean “concerned with distinct, unconnected, or unrelated parts” (synonym: non-continuous). Discrete is a Middle English word, coming from the Latin discretus, which is the past participle of discernere, meaning ‘to separate, distinguish between’.

During the TaLL Summer Math Institute, Discrete Math was the topic of discussion. Teachers participated in hands-on activities, learned how to plan new lessons involving Discrete Math topics, and talked about student thought processes when using Discrete Math.

Some topics that were included were: How Discrete Math can be used with regard to the NJ Core Curriculum Content Standards; counting techniques such as permutations and combinations; graph theory and networks, and recursion. Teachers worked on planning in the computer lab and in a traditional classroom setting.

Participants also discussed problems that they were having in their classrooms and made suggestions on how they can improve the students’ understanding of these topics. Each participant had the opportunity to create a lesson plan with an activity that they could take back to their classroom and use when school started. Then these lesson plans were copied and shared with the members of the workshop so that everyone left with multiple lessons.

Here is a sample problem that was discussed at length during the workshop:

Determine how many students are in your class, including yourself. If each student shakes hands with every other student in the class, how many handshakes will there be? (There is exactly one handshake for each pair of people.)

**Follow-Up TERC Investigation Institute**

Dr. Cathy Liebars and Dr. Sharon Sherman held TERC Investigation Institutes in June and July of this summer and last summer. Cathy instructed the teachers of grades 3-5 and Sharon instructed the teachers of grades K-2. The TERC Investigation Institutes trained Trenton Teachers how to use the new Investigations curriculum in their classrooms and gave them ideas to be able to create hands-on units and activities using the new curriculum.

As a follow up to what they had presented in these Institutes they will be holding a series of after school workshops. They will take place on Wednesdays after-school from 4:00-6:30 pm.

<p>| Upcoming Dates: |</p>
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(April 5, alternate date in case of a snow day or other unforeseen event)

For more information about the programs please contact Maryann Klaus in the Trenton Board of Education Office at: 609-656-5473.
Spanish and Science Workshop

What would it be like to come to a new country where your language is not the one spoken in a classroom? How can a teacher experience how a new student feels when the language they are speaking is not the same? More interestingly, can discovery science activities serve to bridge the understanding between languages and can the science found in other cultures be used to enrich our current elementary curriculum? These were some of the questions serving as the basis for an after school workshop at TCNJ sponsored by the TALL Program.

Designed and orchestrated by Science Methods instructor Linda Burroughs, this outreach workshop for Spanish-speaking teachers and teachers of second language students was successfully launched to showcase the scientific contributions of the Latino cultures and to give non-Spanish speakers a try at communicating in creative ways. The workshop was a combination of contributions by members of TIES and TALL who spoke Spanish, science methods instructors Jim Messersmith and Henry Harms, and the wonderful Spanish cooking skills of Ms. Michelle Ordini who provided a cultural supper of arroz con pollo for participants. Documenting the activities was Rich Albe, photographer, who enjoys filming our workshops so they can be shared later as teaching ideas.

Activities for this workshop included using translation cards for common expressions in both languages, communicating without words, working solely in Spanish to create a science project, reviewing and testing culturally adapted science activities such as using natural dyes (Life Science), counting with a Quipoo (Standard 5.3) and working with ideas for terracing (Earth Science). Participants had to try and build simple machines (Physics) with their “instructor” speaking only Spanish. Adding to the discussion and spontaneous exchanges of information were specific questions drawn from a Copa de Questiones which addressed some of the ideas of teaching bi-culturally. The evening ended with a now famous Cup Game where participants had to work cooperatively to keep pace with a rhythmic Spanish song.

We discovered that learning and speaking a second language is not at all easy for adults; but the experience of working through activities in this context was indeed valuable. It was a good time for sharing and exchanging information on teaching science as well as learning to consider more cultural applications within our science units. These after school workshops are held from 4:00-6:30 pm, scheduled on Wednesdays in Armstrong Hall at The College of New Jersey, and include a light supper. Other workshops will be announced soon. These will include learning to use the computer to design and print your own activity pages for student use in science class, designing investigations and covering content areas for the NJ standards. Other topics for these workshops are invited. We love designing materials teachers can use! Please email: burrough@tcnj.edu or ordini@tcnj.edu with any topics that you would like to learn more about.
The 2005 Tall Summer Institute also featured a fourth day of training in the areas of mentoring, equity and diversity. “To Reach All, Teach Each,” was held for the Trenton math and science institute teachers in a combined full-day session.

Dr. Sharon Sherman, TCNJ Professor, Elementary and Early Childhood Education, and Co-Principal Investigator for TALL, presented the session on mentoring where participants learned about the functions of mentors and good mentoring strategies and techniques.

Mary Switzer, TALL project director, and Dr. William Alexander presented a morning session introducing an overview of gender equity initiatives and activities relating to areas of disparity by demonstrating and modeling equitable classroom techniques and activities for the participating Trenton teachers, including the Social-Emotional-Disparity Index. The teachers were able to bring back information and materials to assist them in practicing equitable classroom techniques.

The afternoon session introduced the True Colors® diversity training where the participants identified their preferences in relationships to four distinct perspectives and personalities, supporting the basic values of self-confidence, pride, dignity, worthiness and esteem. They had very lively, interactive groups working in their primary color preference throughout the afternoon and were able to bring back examples of ideal instructional group work and ways to utilize True Colors® in their everyday interactions in school and other environments.

**Family Tools and Technology**

Family Tools and Technology (FTT) is an award-winning gender equity, after-school program that focuses on technological design and problem solving while supporting the application of mathematics and scientific principles. Design and problem solving activities in FTT are especially appropriate for girls and boys (grades 4-7) and their parents/guardians.

FTT offers teams of two teachers from each school to attend the 4-day train the trainer sessions and then involve family teams at their local school in a variety of exciting design challenges in pre-engineering, architecture, and physical science. Each of the seven-week, after-school FTT sessions allows families to investigate, explore, problem-solve, and gain an understanding of how our human design works. FTT presents situations that spark curiosity and creativity, causing family teams to pose questions and become engaged in discovering the answers. By linking theory with practice, providing instruction on the design process and allowing for individual creativity, FTT helps girls and boys build confidence in their ability to plan and realize that they are capable of using technology to create solutions to real problems.

Families have fun and gain an understanding of how things work, acquire confidence in safely using tools and equipment, learn to think critically and increase their confidence in solving technological problems. All Family Tools and Technology activities are aligned with the NJ Core Curriculum Content Standards in Mathematics and Science as well as national standards for Technological Literacy.

For more information, contact Mary Switzer at switzer@tcnj.edu or 609-771-2714.
Summer Science Institute

The TaLL Summer Science Institute was another opportunity for K-5 teachers to network and learn more elementary science together. Highly successful in terms of both participation and learning, 31 participants came from almost all of the Trenton elementary schools to work with Jim Messersmith and Linda Burroughs, workshop instructors, to better understand teaching science in their classrooms. These teachers left the three days of workshop training with a binder full of hands on lessons, a CD of complementary activities and an understanding of NJ Core Curriculum Content Standards that the lessons fulfilled. The emphasis of this summer institute was “content understanding in support of science lessons frequently used.”

Content areas in science were presented in brief lectures as a means of preparing teachers to better understand the principles behind the activities used to support this learning in the classroom. Content topics included the chemistry of molecular attraction and formation of light (purple cabbage juice, mixing colors and properties of water curricula), force, magnetic attraction and electricity (physical sciences), plate tectonics (earth science), ocean currents (oceanography), comet formation, impact and planetary movement for space science and using and maintaining living organisms in the classroom (life science).

Each day focused on two of these content areas with the underlying emphasis being the development of investigative questions with children. The Inquiry Process skills of the teachers were nurtured using several unique activities showing the power of questions, the types of questions and how to reduce the yes/no question response commonly heard in classrooms to more thoughtful replies. All activities used in the workshop were part of recognized national curricula, such as GEMS and FOSS, the Project Astro material (Raritan Valley CC) and original material.

After experiencing the lab activities, participants shared their thought processes and the steps they took to get to their results with each other and as a group. This is another important feature of Inquiry science. Some of the hands-on activities that the teachers participated in were: Making a Comet, The Crater Drop, Mystery Powders, Phases of the Moon, Working with Crayfish, Force and Energy, Making Rocks, Plotting Ocean Terrain, Making A Rainbow with Salt water concentrations, Earths Layers, Science Process Skills for Observations, and Circuits and Wiring.

On day three of the Science Institute, participants were treated to real time life science! A member of Snakes n Scales brought in an interesting collection of large reptiles for a Show and Tell with the teachers. Besides the excitement of seeing these amazing animals, the presenter spoke to the environmental impacts of extinction for these creatures, their roles in balancing environments, the effects of abuse, their care, and how he uses them to teach children (see article on Snakes-n-Scales).

There was so much to learn and assimilate from this workshop that everyone hated parting. The good news is that Rich Albe recorded most of the workshop on tape, and we hope you enjoy some of his pictures on our web site composed by Michelle Ordini. We had a wonderful time with all of you who attended, and hope to see you again in future workshops and maybe even your classrooms! Instructors Jim, Linda and Mary, assistants Amanda, Lucy, and Michelle, tech supporters Ken, Dave and Rich hope you will continue to support science in your classroom and invite us back. We hope you keep in touch with each other, keep reading those interesting articles in the professional journals for teaching children science and sharing any great science lessons you find with us!

For the grand finale of the Summer Science Institute, teachers were face to face with some of the animals. Bill Boesenberg from Snakes-n-Scales and Turtle Tales gave a very factual presentation. Snakes-n-Scales presents environmental education programs for people of all ages with an emphasis on learning through enjoyment. Their philosophy and practice is that people remember best what they enjoy. If anyone, children and adults, are to learn desperately needed environmental values, ecology, conservation, respect for life on Earth or simply not be afraid, they will learn well if they enjoy it.

Bill showcased some live animals - a crocodile, an alligator, a monitor (cousin of the Komodo Dragon), a snapping turtle, and an albino python. These are some of the great animals that he can bring to a classroom. The presentations are usually an hour long and as he shows one animal at a time, he tells you all about where they live, what they eat, and tries to answer any questions you may have about the animals. The only animal the participants were allowed to touch was the python. You had the option to touch it if you had the courage to do so.

There are a variety of programs that can be done at your school and, you can choose one visit, 4 visits, 8 visits, or 10 visits. If you choose one of the multiple visit packages they will break them down. For example the first visit may be turtles, the second may be mammals, and the third may be snakes, etc. and the prices are very reasonable. Snakes-n-Scales is an acclaimed rescue group and have been so successful with what they do, they have over 500 individual animals and well over 200 species. If your school is interested you can contact them at: 973-248-9964 or check out their website at: SNAKES-N-SCALES.COM.

Content can also be presented visually!
Learning about magnets at the Summer Science Institute

The "I see samba" song at the Spanish and Science Workshop

Creating boxes at the Summer Science Institute

Mr. M learning how hard it is to receive directions as a non-native English speaking student

Cathy Liebars elaborating on a topic at the Summer Math Institute

Creating Beautiful Colors

Cooperative learning project, Building a tower without being able to communicate verbally

Force and Energy demonstrated with design challenges
The Center for Innovation in Engineering and Science Education (CIESE)

The mission of CIESE is “to catalyze and support excellence in teaching and learning of science, technology, engineering, mathematics (STEM) and other core subjects through innovative, research-based instructional strategies and use of novel technologies.”

*This program offers FREE lesson plans, educational links, and opportunities to participate in collaborative projects, real time data projects, projects using primary sources and archived collections, and partner programs with your class.

http://www.k12science.org

ExploreLearning

ExploreLearning offers over 400 modular, interactive simulations in math and science for teachers and students in grades 6 to 12. The simulations are called Gizmos and are designed as supplemental curriculum materials that support state and national standards. Students can use the interactive Gizmos and then take an assessment online. You can register for a free 30-day trial.

http://www.explorelearning.com

Project Astro

The Astronomical Society of the Pacific (ASP) sponsors this national program which provides opportunities for professional and amateur astronomers to contribute to science education in their local communities. The focus is on hands-on, age-appropriate activities where students act like scientists in order to find answers to their own questions. The website provides some sample activities and information on how to get involved.

http://www.astrosociety.org

Snakes-n-Scales and Turtle Tales

This New Jersey based company presents environmental education programs for people of all ages. They offer 12 different programs including: Animal Friends, Mammal Mania, The Good, the Icky and the Slimy, and Dinosaurs and Fossils to name a few. If you can’t make it to the zoo, bring the zoo to you! For more information: 973-248-9964 or

http://www.snakes-n-scales.com

TeacherVision

This website offers cross-curricular lesson activities as well as printables, quizzes, rubrics, theme ideas, and classroom management ideas. Many of the lessons can be accessed for free, but a membership is required for the printables.

http://www.teachervision.fen.com

Book: Science Notebooks: Writing About Inquiry by Brian Campbell

Science notebooks are a great way to build science content and process skills while also supporting literacy. This book is a resource for developing strategies and methods for using science notebooks in your classroom.

Teach at the Beach

The New Jersey Marine Education Association is presenting Teach at the Beach, a Professional Development Program that will bring the ocean into any classroom. The program will take place Friday, May 19, 2006 at the Wetlands Institute, 1075 Stone Harbor Blvd., Stone Harbor, NJ. Some of the programs include Creating a Saltwater Aquarium, Virtual Whale Watch, and Green Eggs & Sand. Space is limited to 125 participants. For more information:

http://hometown.aol.com/newjerseyme/register.html

Aquatic Discoveries

This program is dedicated to educating children about our marine environments in a fun, interactive, and hands-on way. The programs are taught by experienced marine biologists and educators. They offer educational boating excursions or they can bring live sea animals to you. For more information: 609-889-4066 or

http://www.aquaticdiscoveriesinc.com
Please Save the Following Dates:

FTT
Family Tools and Technology Training
The NJSSI Regional Center at The College of New Jersey hosts
4-Day Introductory FTT Professional Development Workshops
during the Fall for new teams of teachers.
(Two teachers per team are preferred but not required)
Registration forms are available online at: www.tcnj.edu/~njssi
For more information please contact Mary Switzer at 609-771-2714
or switzer@tcnj.edu

TERC Investigations
A continuation of Elementary Math Inquiry Institute with TERC Investigations
Contact Maryann Klaus in The Trenton Board of Education Office
for more information at 609-656-5473

Savvy Cyber Teacher
Coming again for the 2006 Spring Semester (from January-May) will be another graduate-level course offering of Enhancing Curriculum and Instruction with Computer Technology for Teachers Who Teach Grades 4-7 Science (INCD 56290), in collaboration with the TaLL program staff and Stevens Institute of Technology's Savvy Cyber Teacher Program.
Look for more information in the next edition of The TaLL Times or at http://tall.intrasun.tcnj.edu

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The TaLL Times staff invites you to send us your comments and suggestions on what you are infusing in your classrooms as a result of participating in the TaLL Program.

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