

P E N - I N T E R N A T I O N A L



# PEN-INTERNATIONAL TEACHING MATHEMATICS TO DEAF COLLEGE STUDENTS: THE NTID MODEL WORKSHOP

J U N E 2 0 0 4

---

## SUMMARY REPORT

Workshop presented by:  
Vince Daniele, Science & Mathematics Chairperson, NTID  
Joan Carr, Mathematics Instructional Faculty, NTID

[http://www.pen.ntid.rit.edu/workshops/CU\\_Mathwksp\\_04/Wkshp\\_Resources.htm](http://www.pen.ntid.rit.edu/workshops/CU_Mathwksp_04/Wkshp_Resources.htm)

PEN-International  
National Technical Institute for the Deaf  
Rochester Institute of Technology  
52 Lomb Memorial Drive  
Rochester, NY 14623

<http://www.pen.ntid.rit.edu>

November 5, 2004

PEN-International is funded by a grant of The Nippon Foundation of Japan



# PEN-INTERNATIONAL

## TEACHING MATHEMATICS TO DEAF COLLEGE STUDENTS: THE NTID MODEL WORKSHOP

### SUMMARY REPORT

---

#### INTRODUCTION

---

On 23-24 June 2004, PEN-International provided the faculty of PEN partner universities in China with a series of lectures, workshops and activities related to teaching mathematics to deaf students. Workshop participation was also extended to teachers of pre-college deaf students from throughout China. The workshop session was designed and presented by Vince Daniele, Professor and Department Chairperson, and Associate Professor Joan Carr, both of the NTID Department of Science and Mathematics.

The two-day session entitled *Teaching Mathematics to Deaf College Students: The NTID Model* was held on the campus of Changchun University. The workshop focused on:

- teaching mathematics at NTID;
- using technology in the math classroom;
- issues related to teaching deaf students; and
- implications for teaching mathematics in China.

There were approximately 40 faculty members in attendance. The presenters provided participants with workshop materials in both English and Chinese, electronic copies of which were provided on a CD. The CD also contained supplemental resources of potential interest. The additional resources comprised of an overview of PEN-International's charge, PEN's workshop and training initiatives, information pertaining to NTID, RIT, the NTID Technology Symposium, and materials related to teaching and technology.

During the workshop, participants were specifically trained on how to use the Texas Instrument TI-83 Calculator. PEN-International has made arrangements to purchase special Texas Instrument teaching calculator systems for the three PEN partner universities in China.

In an effort to continuously improve and provide workshops that best meet the needs of PEN-International partners, PEN-International conducted an evaluation to assess participants' experiences. In addition, a personal interview was conducted with the two presenters, Vince Daniele and Joan Carr. Professors Daniele and Carr provided valuable input from the presenter point of view. The following report summarizes these findings.



*Professors Daniele and Carr and  
Faculty Workshop Participants*

---

## METHODOLOGY

---

### *Evaluation Design*

The workshop evaluation consisted of 13 questions in total. The types of questions included rating scale and open-ended. Rating scale questions were based on a 5-point scale ranging from “strongly agree” to “strongly disagree” or a 4-point scale ranging from “excellent” to “poor.” Respondents were asked, in open-ended format, what they liked most about the workshop and suggestions for improving the workshop. Respondents were also given the opportunity to write-in any additional comments.

### *Sampling*

The evaluations were conducted using a self-administered methodology. Participants were encouraged to complete the evaluations on-site at the completion of the two-day workshop.

A total of 13 out of 37 evaluations were completed resulting in a margin of error equal to  $\pm 22\%$  in estimated values of the participant population (based on the finite population correction factor at the 95% confidence level). It is important to note that there was a power failure on day two of the workshop. While unbeknownst to the PEN-International instructors, 22 participants decided against returning to the workshop after break either due to the power outage or the need to catch a bus back to their home town, Jilin City. As a result, only 15 participants actually had the opportunity to complete an evaluation form.

On 7 October 2004, a personal interview was conducted with the two presenters, Vince Daniele and Joan Carr. During the hour-long session, Professors Daniele and Carr described their experiences and provided suggestions on how to improve PEN-International workshops in the future.

### *Analysis*

Most of the findings are presented using percentages. For all rating scale questions, the total responding to the question was used as the percentage base. For most other types of questions, the total sample was used to compute percentages. The percentages for individual response categories do not always add up to 100%. This results from either rounding factors, a small percentage of no answers, or multiple responses provided by respondents.

In addition, all open-ended questions were coded in an effort to quantify responses. The actual verbatim responses are included at the end of this report.

## OVERALL EVALUATION ASSESSMENT

Participants were asked to rate their overall assessment of the *Teaching Mathematics to Deaf College Students: The NTID Model Workshop*.

Over three-quarters (77%) of participants rated the overall workshop as either excellent (46%) or good (31%). The remaining three participants rated the workshop fair (23%).

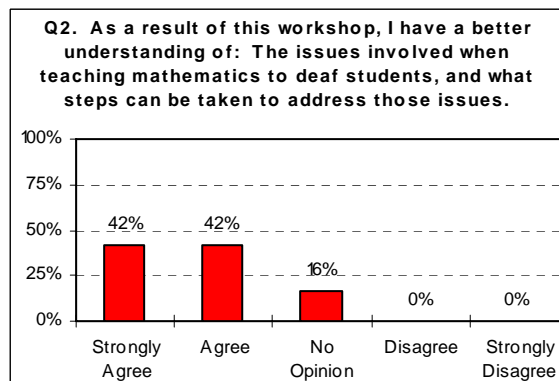
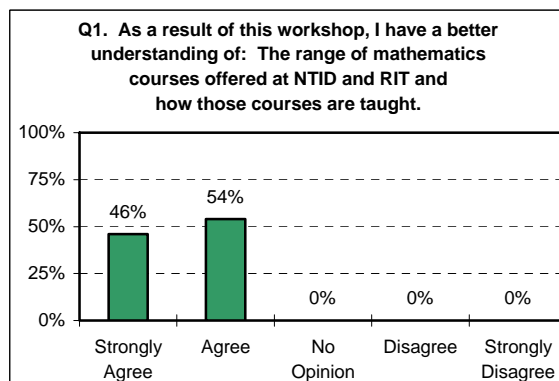
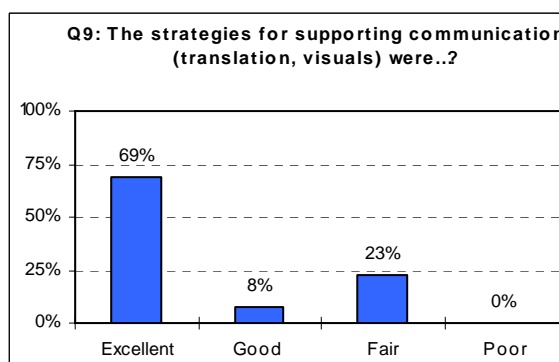
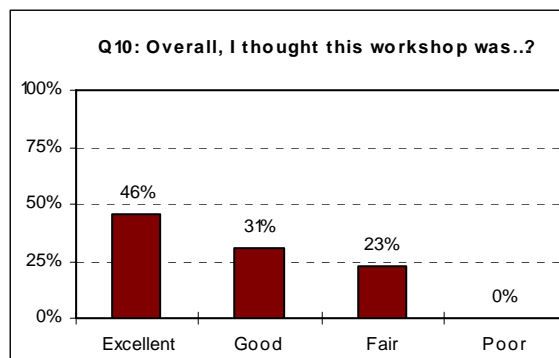
Participants were asked to rate the strategies for supporting communication (translation, visuals) at the workshop, and the results are very favorable. Most (69%) participants agreed the strategies used to support communication were excellent. Eight percent (8%) of participants rated the strategies good, while the three remaining participants rated the strategies for supporting communication fair (23%).

All (100%) of the participants either strongly agreed (46%) or agreed (54%) that as a result of the workshop they now have a better understanding of the range of mathematics courses offered at NTID and RIT and how those courses are taught.

As a result of their participation in the workshop, 84% agreed (strongly agree/agree net score) that they have a better understanding of the issues involved when teaching mathematics to deaf students, and the steps that can be taken to address those issues.

Similarly, 82% of participants either strongly agreed (46%) or agreed (36%) that they now have a better understanding of the technology used to teach mathematics at NTID, how that technology is used, and why that technology is used. One participant (9%) disagreed with this statement.

Participants were asked to rate the presenters in several areas including being well-informed on the topic area and offering new and interesting information, effectively organizing the workshop, and offering material that is relevant to participants' needs.



Most (85%) participants agreed (strongly agree/agree net score) that the presenters were well-informed on the topic area and offered new and interesting information.

Almost all (92%) of the participants either strongly agreed (67%) or agreed (25%) that the presenters effectively organized the workshop. One participant (8%) disagreed with this statement.

Most (82%) participants agreed that the presenters offered material that was relevant to their needs. One participant (9%) strongly agreed with this statement, and similarly, one participant (9%) disagreed with this statement.

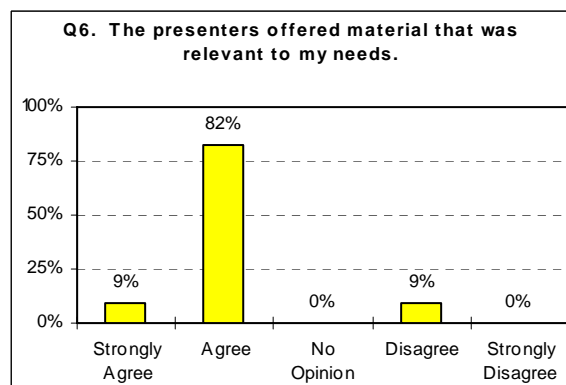
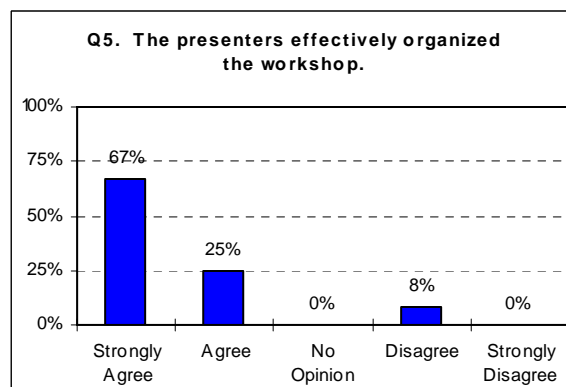
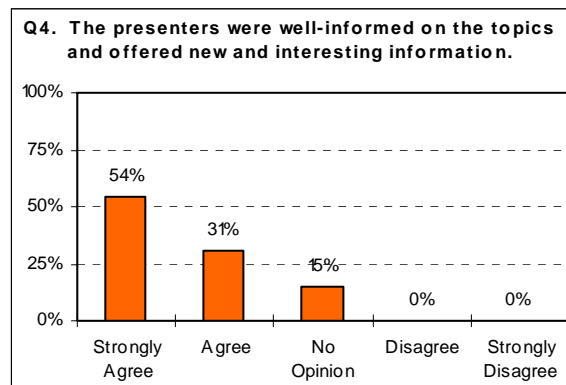
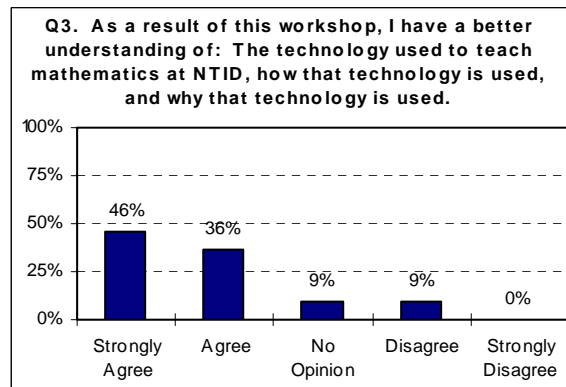
All (100%) of the participants either strongly agreed (67%) or agreed (33%) that the workshop was a positive professional development experience.

Almost all (91%) of the participants agreed (strongly agree/agree net score) that the methods, materials, and technologies learned in the workshop can be used to teach deaf students in their own program.

The participants that rated the overall workshop as fair did not feel the material presented during the workshop was relevant to their needs/program or that they have a good enough understanding of the technology used to teach mathematics at NTID.

Participants were asked, in open-ended format, what they liked most about the PEN-International workshop. Thirty-nine percent (39%) of all participants mentioned that they liked the methodology of the workshop most. Similarly, 39% mentioned finding value and similarities in the discussions related to issues and barriers to teaching deaf students, and 39% said they liked learning how to use the TI-83 Calculator. One participant (8%) mentioned that he/she liked the horizontal interception of the point explanation as well as the question and answer segment of the workshop most.

*"I liked the methodology, materials and technology used in this workshop. I got to have the*



*opportunities to understand the strength and weakness, job opportunities for the deaf.”*

*“For both Chinese and American deaf students they seemed to have similar barriers when they learn math.”*

*“The application of TI-83 Calculator.”*

*“What I liked best is the explanation of the horizontal interception of the point and line as well as the question and answer sections of the workshop.”*

Participants were also asked, in open-ended format, their opinion on how the workshop could have been improved. Thirty-nine percent (39%) of participants suggested providing participants with more examples on how to overcome the issues and barriers related to teaching deaf students. Sixteen percent (16%) said they would have liked more information on math teachings in the United States. Two responses suggested improving the workshop by providing every participant with a calculator (8%) and better/more accurate oral translation (8%).

*“It could be better if there were more details on how to solve students’ problems.”*

*“In depth discussion of problems and issues related to deaf students learning math.”*

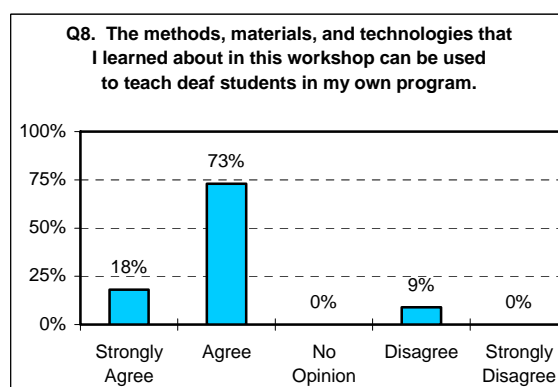
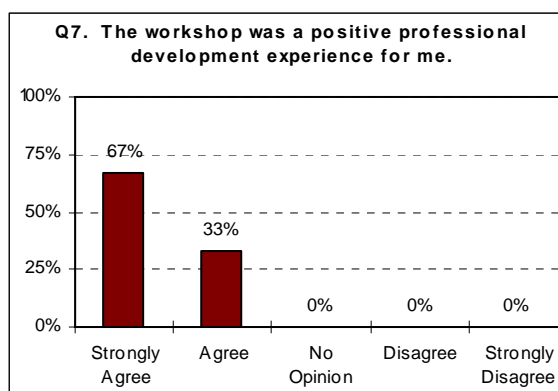
*“More discussion on math teachings in the US.”*

Participants were given the opportunity to write-in any additional comments. Almost one-third (31%) of participants said they would like to see more of these kinds of workshops available. One participant specifically mentioned the need to offer the mathematics workshop directly with deaf students.

*“I would suggest holding the workshop directly to deaf students, teaching them about concept and methods of learning math.”*

Another participant expressed the desire to observe a mathematics class at NTID in person.

*“The workshop is great. I hope to have more workshops. I would like to observe math teaching at NTID.”*



#### Question 11 What did you like most about this workshop?

- Methodology of workshop – 39%
- Issues related to teaching deaf students – 39%
- How to use calculator/technology – 39%
- Horizontal Interception Explanation – 8%
- Question and answer segment – 8%

#### Question 12 How could this workshop have been improved?

- More examples on how to overcome barriers – 39%
- More information on math teachings in US – 16%
- Calculators for each participant – 8%
- Better oral translation – 8%

---

## PERSONAL INTERVIEW WITH PRESENTERS

---

Vince Daniele, Professor and Department Chairperson, and Associate Professor Joan Carr, both of the NTID Department of Science and Mathematics, presented a workshop entitled *Teaching Mathematics to Deaf College Students: The NTID Model* at Changchun University in June 2004. A personal interview was conducted with the presenters on 7 October 2004 to access their overall workshop experiences.

Professors Daniele and Carr immediately expressed their gratitude for being given the unique opportunity to conduct a mathematics workshop in China. Both professors felt the overall experience was incredible.

The presenters mentioned that James DeCaro, PEN-International director, and E. William Clymer, PEN-International coordinator, provided advice prior to their journey that turned out to be invaluable. DeCaro and Clymer advised the presenters to be flexible and expect to “think on your feet.” Daniele and Carr suggested that DeCaro and Clymer continue to reinforce this fact to future presenters.

While the overall experience was extremely positive, presenters Daniele and Carr provided suggestions for improving PEN-International workshops in the future. These suggestions include:

- observing classes in session prior to the workshop;
- being provided with a list of participants and their job functions;
- informal opportunities to meet and interact with participants prior to the workshop;
- more than one translator;
- a translator proficient with topic area; and
- time for equipment set up and testing.

Daniele and Carr said that in order to better meet participant expectations it would be helpful, prior to the workshop, to observe classes in session to adequately assess how instructors currently teach deaf students and the issues and barriers that they face. The presenters also mentioned that it would have been helpful to receive a participant list that included job function, and be provided with informal opportunities to meet and interact with participants prior to the workshop. Daniele and Carr concluded that not knowing the specific job function of each of the participants and not having the opportunity to interact with participants prior to the workshop made it somewhat difficult to determine needs and to draw-in and engage participants during the session. The presenters believe that fewer than half of the participants were math teachers. During the workshop, two participants indicated that they were teachers of Chinese or Chinese Sign Language, for example. Moreover, it was unclear what subjects were taught by some of the pre-college participants.

Daniele and Carr suggested that it would have been beneficial to provide a translator for each presenter, particularly in social situations. They said they feel that one translator between the two of them made it difficult to approach and develop individual relationships with the participants. They also suggested that in order to maximize the benefits of a workshop, the translator be proficient in the content subject matter, if possible. At the Changchun workshop, some time was needed for participants to assist the translator with certain mathematics vocabulary.

Daniele and Carr found it helpful that they had been warned in advance of the possibility of equipment and technical difficulties. Although several technical difficulties were encountered prior



to and during the workshop, these were graciously and skillfully addressed by the in-house technical support staff at Changchun University. Future presenters should be advised to expect such potential difficulties and build into their schedules time for set up, testing, and break down of equipment.

The day trip to Jilin City and Songhua Lake was a particular highlight for Professors Daniele and Carr. The post-workshop expedition provided the presenters with an opportunity to connect with the workshop participants. In addition to Daniele and Carr, approximately 20 participants made the trip to Jilin City at which time they met up with an additional 10 other workshop participants. The presenters noted the beautiful sights, and took particular pleasure in the opportunity to interact with the participants. Likewise, the presenters greatly appreciated the warm treatment they received while visiting Beijing prior to their workshop in Changchun. The hospitality of their hosts in Beijing helped acclimate them to various aspects of Chinese culture.

Presenters Daniele and Carr said they felt showing participants the NTID recruiting video from the RIT/NTID *A Unique College...A Superior Education*, 3<sup>rd</sup> Edition CD was extremely effective as it “brought added life” to the workshop. The video was described as being fast and upbeat, and participants were particularly interested in the pictures of the local Rochester area. Although there was only limited time to use an American Sign Language CD they had brought, the presenters found that some of the signs it contained were no longer accepted as standard.

---

## VERBATIM RESPONSES

---

*Question 11: What did you like most about this PEN-International workshop?*

For both Chinese and American deaf students they seemed to have similar barriers when they learn math. TI-83 Plus calculator is very impressive.

I like the methodology, materials and technology used in this workshop. I got to have the opportunities to understand the strength and weakness, job opportunities for the deaf.

Issues related to teaching deaf students.

What I like the best is the explanation of the horizontal interception of the point and line as well as the question and answer sections in the workshop.

How to use the calculator. How to teach deaf students.

Something about math education technology.

I like the math teaching methodologies to deaf students in the US.

Definition on math in NTID. The importance of language in math teaching. The application of TI-83 calculator.

I like the idea of focusing on individual student in teaching math as well as career development for the deaf. The major are based on the curriculum. I also liked the teaching method and technology.

*Question 12: How could this workshop have been improved?*

It will be a good idea for every attendee to have a calculator. I like the form of this workshop.

We'd like to hear more methods or examples about how to solve those questions above.

It would be better if the oral translation could be a little bit more accurate. More examples in math teaching and how to solve math problems.

It could be better if there was more details on how to solve students' problems.

The way of teaching deaf students.

I am interested in knowing how teachers use American Sign Language in math teaching. More discussion on math teaching in the US.

In depth discussion of problems and issues related to deaf student learning math.

*Question 13: Do you have other comments or feedback?*

The Chinese translation is very precise. I would like to have more of this kind of workshop.

I would suggest holding the workshop directly to deaf students, teaching them about concept and methods of learning math.

I felt the workshop was like promoting a new product.

Have more similar workshops about instructional technology.

The workshop is great. I hope to have more workshops. I would like to observe math teaching at NTID.

The arrangement of curriculum is successful at our department. Math is not the barrier to graduation for deaf students, instead the language (English) is. I agree with Dr. Daniele's statement since I have the same experience.

L:\Current Projects\Projects\_completed\Daniele-Carr China June 04\Teaching\_Math\_Changchun\_Rpt\_Final\_12-03-04.doc