

Blue Ribbon Applied Geometry

Report of Project

Improving Teacher Quality Grant Program  
ITQ-04-WVU-2

Institute for Math Learning  
West Virginia University  
Morgantown, WV

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Project Director

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## Report of Project

### Blue Ribbon Applied Geometry Improving Teacher Quality Grant Program ITQ-04-WVU-2

Twenty-three mathematics/special educators participated in the Blue Ribbon Applied Geometry Institute during the summer and fall of 2004 at the Institute for Math Learning at West Virginia University (WVU) through the Improving Teacher Quality program. In May of 2004, 31 teachers expressed intent to register for the project. 6 of those teachers failed to submit an application. The week before the institute, two participants withdrew for personal reasons. Of the 23 participants, 14 chose to use the opportunity to gain graduate level mathematics credit through WVU. The purpose of this institute was to provide professional development to mathematics and special educators, with the specific goal of improving the quality of teaching Geometry to students with special needs. The framework for the professional development was a long institute with two, one-day follow up sessions. In addition, a NASA Mini grant was obtained to provide an additional day of content related professional development. The institute had the following objectives for teacher participants:

- ▶ Strengthen technology skills that enhance and are an integral part of the learning of mathematics.
- ▶ Work with activity based examples.
- ▶ Enhance a previously established regional collaborative for both mathematics and special educators teaching similar content.
- ▶ Become more aware of the characteristics and needs of special populations in the geometry classroom.
- ▶ Learn to adapt curriculum and instruction for special populations.
- ▶ Correlate the concepts taught in high school mathematics to real-world applications.
- ▶ Learn from leaders with specialized expertise as well as from peers.

The project director was Dr. Laura J. Pyzdrowski, Ed. D, Assistant Professor of Mathematics in the Institute for Math Learning at West Virginia University. Educational consultants were Dr. Ann Richards, Assistant Professor of Special Education at West Virginia University and Amy Rice, the Special Education Department Chair at Frankfort High School in Mineral County, West Virginia.

#### *Recruitment of Participants*

A recruitment flyer was prepared and posted on the Blue Ribbon Mathematics Partnership Committee Web Site: [www.blueribbon.ws](http://www.blueribbon.ws). An application form was also prepared and posted on the site. ( See the attachments for a copy of the flyer and application form. ) The blue ribbon hosting counties and institutions were contacted to submit names of sponsored participants. Several late applicants from participating counties were placed on a wait list. Once all Blue Ribbon affiliated participants were accepted, vacancies were filled on a first come, first to get in basis. Three participants attended the project and paid the registration fee with personal funds. Two paid because their home county would only sponsor two teams and one participant decided

to not ask for funds from her private school. All of the 23 accepted participants were from West Virginia educational institutions and were awarded stipends and given instructional materials. The project director and consultants did not receive stipends, but did receive instructional materials.

### *Participants*

The following educators participated in the institute:

<b>Name</b>	<b>School</b>	<b>County</b>
Teresa Anderson	University	Monongalia
Gale Boden	Frankfort	Mineral
Robert Browning	Keyser	Mineral
Andrea Cathell	( moved to Morgantown High)	Ohio
Megan Fuller	Hampshire	Hampshire
Donna Garrett	Grafton	Taylor
Lisa Hileman	Preston	Preston
Linda Jackson	Trinity	Monongalia
Rebecca Jackson	Trinity ( Late Withdraw)	Monongalia
Kristy Joyce	Clay-Battelle	Monongalia
Traci Knight	Elkins	Randolph
Charlea Lindley	University	Monongalia
Karen Loomis	Preston	Preston
Michael McKernan	Morgantown	Monongalia
Nelson Meck	Hampshire	Hampshire
Michael Mendicino	Buckhannon-Upshur	Upshur
Tammi Musgrove	East Fairmont	Marion
Laura Pyzdrowski	West Virginia University	Monongalia
Amy Rice	Frankfort	Mineral
Ronald Schleger	Substitute Teacher	Monongalia/Garrett
Jean Schmidt	Elkins	Randolph
Diane Smith	Grafton	Taylor
Patricia Trimble	East Fairmont	Marion
Rebecca Tucker	Morgantown (Late Withdraw)	Monongalia

Fred Ware	Clay-Battelle	Monongalia
Renee Warner	Buckhannon-Upshur	Upshur
Amy Rice	Frankfort	Mineral
Ann Richardson	Special Education	WVU
Laura Pyzdrowski	Mathematics	WVU

## ***Program***

### **Summer Institute Schedule**

The Institute made use of the *TI-84 Plus* calculators, *Lenart Spheres*, *Patty Paper*, unit blocks and appropriate applications and materials. The activities were correlated to the West Virginia Content Standards and Objectives and performance descriptors. Each participant received, course materials, lunch each day, and a *TI-84 Plus* calculator ( Due to order and shipping problems, loaners were used until the participants received their own calculators.) Professional Development materials that were created by the Educational Development Center were used. In addition, the participants used and received three books: *Working Together: Tools for Collaborative Teaching*, *An Information Sourcebook: Including All Students*, *A General Educator's guide to Teaching a Diverse Student Population* and *Discovering Geometry Book*. Participants also received a *Key Curriculum* workshop binder which included a spherical geometry booklet and many handouts. The calculators were obtained at a discounted price, so teachers also received a *Patty Paper* kit that included a teachers work book, a student workbook and a box of *Patty Paper*. Participants investigated such topics as symmetry and scaling, and used both inductive and deductive reasoning to investigate the theorems and proofs taught in high school geometry in West Virginia. Participants took part in hands-on explorations that modeled effective classroom techniques for discovering and learning Geometry and learned to make that material accessible to all students. West Virginia Content Standards and Objectives, the Westest, and Performance Descriptors were blended throughout the days and sessions of the workshop. Information about Collaboratives and Learning Communities was distributed and discussed. Participants began to prepare and adapt materials to use in their classrooms.

*Fall 2004, Follow - Up:* Two one day follow- up sessions.

*Session 1:* This session continued the development of learning communities and introduced new ideas about the roles in collaborative teaching environments. Participants continued to prepare materials to use in their classrooms. They also learned more about adaptations often needed for students with special needs.

*Session 2: Sharing Best Practices*

Participants presented and shared lessons developed for use in the classroom. They shared work that was selected to represent three different levels of student performance. A web site will be created to make the lessons available to all interested mathematics/special educators.

## ***Evaluation***

### **Journals**

Each participant was asked to respond to five journal entries (See the appendix for responses.) Overall, they felt that their technology skills were strengthened and would be able to integrate new material into the classroom. They enhanced the content knowledge of geometry and had the opportunity to work in a hands on environment with activity based examples. They also had time to work with peers. The educational consultants were rated very well and were seen as expert presenters. Participants gave ideas for future professional development opportunities.

## **Pre/Post Test**

Each participant was asked to take a content/pedagogy pre and post test (See appendix.) The test was developed and graded by the Key Curriculum consultant. The mean score of the pretest was 29.3 and mean score for the post test was 38.3. The total possible score was 48. Due to a binder stuffing error at Key Curriculum, each participant had a blank copy of the test the whole time. This was not known by the project director and consultant until the post-test was given. Participants were not aware that this was an oversight. It was decided to report the results anyway since some information can be gleaned from the scores.

## **Course Evaluations**

Each participant was asked to complete a course evaluation (See the appendix for results.) Selected outcomes from the forms follow: Some participants chose to not respond to all questions of the evaluation.

*Final Comments on Survey:* Great Workshop, Thanks!; Professional demeanor of all members of this Blue Ribbon course was greatly appreciated. The sharing and cooperation among professionals greatly enhances the success of our students, Thanks!; The workshop was great, maybe more info on modifications/adaptations; wonderful!; All of the readings done during the summer were a bit much. Great Job!; The geometry content and the collaborative model both need more time to develop.; The experience was very enjoyable and well worth the time I invested.

### *Summary of Selected Evaluations Questions ( average score out of 5):*

The content in this course was at the appropriate mathematical level.

14- 5's, 8- 4's and 1 -3      4.6

The work assigned in this course will enhance my teaching.

14- 5's, 8 - 4's and 1 - 3      4.4

The course experience will help me teach more effectively.

15- 5's, 7 - 4's and 1 -3      4.6

The discussions about how and why to teach students with special needs were valuable.

15- 5's, 4 - 4's and 4 -3's      4.5

The materials provided were useful.

19- 5's, 3 - 4's and 1 - 3      4.8

As a result of this course, I will collaborate more effectively.

12- 5's, 6 - 4's and 4 -3's      4.4

The organizer/host for this course was helpful.

22- 5's and 1 -3      4.9

The instructor helped me learn how to teach more effectively.

15- 5's, 7 - 4's and 1 -3      4.6

The instructors demonstrated thorough knowledge of the course material.

22- 5's and 1 - 4      4.9

The instructors exhibited a positive attitude and enthusiasm

21- 5's, 21 4's and 1 -3      4.9

The presentation skills demonstrate by the instructor were helpful in communicating the course material.

18- 5's and 5 - 4's      4.8

### *Rating of Overall Experience*

16- 5's and 7 - 4      4.7

## **Improving Teacher Quality Participant Survey**

Each participant was asked to complete an Eisenhower Professional Development Participant Survey

(See the appendix for results.)

*Summary of Selected Evaluation Questions:* 1 participants turned in a multiple answer surveys

Did the workshop increase your knowledge relative to the topic(s) presented?

4 - Somewhat, 4 - Moderate and 14 - Very Well

Did the workshop increase your skills relative to the topic(s) presented?

3 - Somewhat, 8 - Moderate and 11 - Very Well

### **Participant Lessons**

Participants developed lessons to use in their classrooms and were required to share them with the other participants in the institute. Please see [www.blueribbon.ws](http://www.blueribbon.ws) for participant lesson plans which will be available by February, 2005.

Overall the evaluation instruments indicated that the teachers were pleased with the institute, the consultants, and the content.

### *Appendixes*

#### Binder 1

Group Photo

Selected Photos

Improving Teacher Quality Participant Survey

Improving Teacher Quality Project Director Survey

Course Evaluations

Journals

Reading Reflections

#### Binder 2

Flyer and Application form

Workshop Correspondence

Agendas

Course Requirements, grading rubric, comment sheet

Selected Course Materials

















