

# The Importance of Secondary Mathematics Liaisons

**Melissa Walker and Patricia Youman**  
**Vigo County School Corporation**

Vigo County School Corporation joined Indiana University and eight other school districts across the state to participate in the Indiana Mathematics Initiative (IMI) project, a Mathematics and Science Partnership grant funded by the National Science Foundation. As a part of the secondary component of this project, middle and high school teachers from each of the nine districts were invited to participate in several professional development opportunities. These participating teachers became known as the IMI Secondary Mathematics Liaisons.

The authors of this paper, Melissa Walker and Patricia Youman, had participated in an earlier National Science Foundation Local Systemic Change grant, also known as the Indiana Mathematics Initiative, and they were eager to continue their participation in the statewide collaboration of districts and Indiana University. As IMI Secondary Mathematics Liaisons, they participated in the professional development opportunities offered by the project and, in turn, worked to provide professional development opportunities for other teachers in Vigo County, sharing what they had learned.

Through a state Mathematics and Science Partnership (MSP) grant awarded in 2005, Vigo County School Corporation was able to fund a secondary mathematics liaison position for three years. This secondary mathematics liaison teacher has been able to act as a mathematics coach for teachers in three of the six middle schools in the district.

The grant was deemed so successful that a second state MSP grant was awarded to Vigo County, allowing a continuance for two additional years. This second grant was one of only six grants awarded out of the twenty-three applicants in 2008. The three schools — Chauncey Rose, Sarah Scott, and West Vigo Middle — had a predominance of at-risk students in high-poverty schools, as determined by free and reduced lunch and special education statistics.

Patricia Youman was hired as the first liaison. In that role, Pat has spent many hours in the grades 6–8 math and special education classrooms, modeling lessons that utilize cooperative learning, manipulatives, and alternate algorithms to solve problems with real-world applications. She emphasizes lessons that develop student understanding, focusing on the process as well as the content standards from the National Council of Teachers of Mathematics' *Principles and Standards for School Mathematics* (2000). She has been particularly welcomed by special education teachers who see the benefit of individualized instruction and alternative approaches.

In November 2007, Pat was joined by Melissa Walker as the second full-time secondary liaison for Vigo County. Melissa is funded through Title I School Improvement Grant and is now able to provide like services to the other three middle schools: Honey Creek, Otter Creek, and Woodrow Wilson.

## **Responsibilities of the Secondary Liaisons**

The secondary liaisons in Vigo County have worked with teachers on many different levels: statewide, through the IMI project; at a local college, working with pre-service teachers; district-wide, providing workshops for teachers throughout the district; and at the classroom level, providing support for individual teachers.

### Professional Development at the State Level

At the 2007 IMI summer conference, “Sustaining Success by Supporting Teachers,” the authors presented “Fast and Friendly Functions” utilizing TI-73 calculators. The goal of the workshop was to provide teachers with another way to help their students understand how to write a rule from a picture, a table, or a graph. Throughout the session, participants were actively involved in actually doing the graphs, writing rules, and using the TI-73 to help with the process. These activities were adapted from activities given during a presentation by Charlene Larsen and Jane Martin, entitled “Math Matters to Kids: Movies, Bowling, and iPod Devices Using the TI Graphing Calculators.” Both Vigo County Secondary Liaisons had attended this presentation at a Texas Instruments T<sup>3</sup> International Conference with funding provided by the IMI grant.

At the same IMI summer conference, the authors were joined by Bob Fischer, another IMI Secondary Liaison from Honey Creek Middle School in Vigo County, in presenting “Problem Child — Ways to Help Your Students Become Better Problem Solvers.” The focus was on demonstrating methods to help students build problem-solving strategies, while still addressing the Indiana Academic Standards for Mathematics. Sample problems used during the session included some from the National Council of Teachers of Mathematics’ journal, *Mathematics Teaching in the Middle School*, and from *The Art of Problem Solving: Introduction to Counting and Probability* by David Patrick (2007, Alpine, Cal.; The Art of Problem Solving Foundation). The Patrick activities allowed for the use of Venn diagrams as a problem-solving strategy. The presenters shared the website address for [www.artofproblemsolving.com](http://www.artofproblemsolving.com), so that teachers could continue learning about new strategies.

### Professional Development at the College Level

Melissa has for the past four years been a guest lecturer in the pre-service elementary education classes at Indiana State University, demonstrating the use of graphing calculators in elementary classrooms.

### Professional Development at the Corporation Level

The ongoing monetary support of IMI has allowed Vigo County to provide the professional development that is desperately needed. Teachers were paid stipends through IMI to attend the first four of the following workshops.

- Activities for secondary teachers included a full-day workshop, *Making Middle School Math Meaningful (M<sup>4</sup>)*, prior to the start of school in August 2007. Presenters were Gail Artis, Coordinator for Mathematics K-12; Patricia Youman, secondary liaison; and Donna McLeish, IMI consultant. Pat had developed a complete matrix of lessons, geared toward the Indiana Academic Standards and Indiana’s state test, mapped to demonstrate weaknesses in content for the middle schools, and presented the booklet to all participants. Pat also taught the alternate algorithms used by elementary students in the *Everyday Mathematics* program to all the secondary teachers in attendance, and she demonstrated some hands-on activities to be incorporated into the regular textbook lessons.

- An after-school workshop on “Alternate Algorithms for Algebraic Aptitude” was presented twice to middle school teachers. Some middle school math teachers had been reluctant to allow students coming from the *Everyday Mathematics* curriculum in grades K–5 to use the alternate algorithms they had learned, even though the students were achieving success in their computational skills via the algorithms. These workshops acquainted teachers with the methods, their tie with real number sense, and the student success achieved by using these methods. The workshops were very hands-on and received excellent evaluations. Pat was joined in her presentations by IMI Secondary Liaisons Bob Fischer and Melissa Walker.
- A highly successful evening “Mathematics Workshop for Secondary Mathematics Teachers” was held in November 2007, when the authors presented mathematics activities (sample activities can be found on the IMI website, <http://www.indiana.edu/~iucme/>) to twenty-five participants from all six middle schools and all four high schools in the school corporation.
- Another IMI Secondary Liaison, Brad Branham, from Columbus North High School in Bartholomew Consolidated School Corporation, presented to high school math teachers from all the Vigo County high schools on “Making Algebra Accessible to All Students” and “Study Group Strategies.” He gave many hands-on examples, and Vigo teachers were very complimentary of the workshop. The authors have been able to follow up with these activities in individual teachers’ classrooms.
- The Power Hour Learning Laboratory Mathematics Program was held after school at Chauncey Rose, Sarah Scott, and West Vigo Middle Schools. This three-week program was an opportunity for the Vigo County Secondary Liaisons to provide professional development for mathematics and special education teachers at these schools. Donna McLeish, from IMI, Pat Youman, and Melissa Walker all worked with the teachers to help them prepare lessons using the district’s elementary standards-based program and materials that had been developed by the IMI Secondary Liaison teachers. They spent time talking with the teachers after each session about the sessions. Significant gain was shown on the fall math state tests, especially at West Vigo Middle School.

The authors have also worked on an exemplary project at the elementary level, “Math Magic Saturdays!” This project consisted of fifteen sessions held from November 2007 through May 2008, when more than 200 third, fourth and fifth graders from all eighteen Vigo County elementary schools participated in problem-solving exercises and activities. The magnet program was open to all students who applied. It was held at Sarah Scott Middle School, had both Pat and Melissa as facilitators, along with coordinator Bob Fischer, an IMI Secondary Liaison from Honey Creek Middle School who developed the Saturday program curriculum, and Janis Kluesner, a member of the IMI Select Cadre of elementary teachers. (See “Improving Instruction: The Role of Elementary Math Liaisons,” by Diane Allen, Janis Kluesner, Sharon Kramer, Sandy McFarland, and Eleanor Rodie, (<http://www.indiana.edu/~iucme/perspectives/23allen.pdf>) for more information on the work of the Vigo County Select Cadre Elementary Math Liaisons.) “Math Magic Saturdays!” is just one component of an overall program, “Project Plus: Preparing and Promoting Vigo County’s Mathematical Promise,” which is funded by a two-year grant from a local community foundation.

### Professional Development at the Classroom Level

Both authors work closely with new teachers — Pat worked with seven in 2007 in the three middle schools alone — since often they have not had the opportunity during their collegiate secondary mathematics education training to work with the standards-based curriculum used in Vigo County or with the related hands-on activities. They also work with substitute teachers and, of course, with experienced classroom teachers.

The secondary liaisons visit classrooms to model lessons or assist teachers with particular lessons, as requested. This allows the mathematics teachers to have the one-on-one assistance that workshops are usually not able to provide. When a liaison comes to a classroom to model a lesson, she brings a classroom set of whatever materials are needed for that particular lesson. The students and teacher participate in the activity and the learning experience, and then the classroom teacher is able to present the lesson him- or herself and also has the set of needed materials available. This also allows the classroom teacher to share the lesson and materials with other math teachers in the building.

Using materials from the *Everyday Mathematics* games for grades 5 and 6; *Middle School Math Games* developed by Pat, Melissa, Bob, and other members of the IMI Secondary Liaisons group; workshops conducted by Heather Hart, a dynamic math teacher from Center Grove High School in Greenwood, Indiana; and their own creative minds, Pat and Melissa have a portfolio of games and activities on any mathematics topic at any grade level, 5–12. When developing their own activities, both liaisons have relied heavily on their IMI training. When they receive a phone call asking for help on a specific topic, they reach into their bag of tricks and come up with an answer. They each spend time preparing, since they must assemble complete classroom sets of materials as needed. This provides additional support for classroom teachers, who often do not have the time or budget to create materials. (See the IMI website, <http://www.indiana.edu/~iucme/>, for sample activities and templates.)

### **Final Thoughts**

As middle school mathematics teachers, both authors began working with the first IMI grant. They continued as IMI Secondary Liaisons with the second IMI MSP grant. Through these projects, they developed as teachers leaders. Pat and Melissa now work as Vigo County Secondary Liaisons, which permits them to share their knowledge and support the important work that classroom teachers do. Whether they are facilitating a district-wide workshop or working with an individual teacher, both authors believe the work of the secondary liaisons is to empower teachers and, in turn, students to become strong and confident learners of mathematics.

*Contact info:* Melissa Walker and Patricia Youman  
Vigo County School Corporation  
Honey Creek Middle School  
1000 Carlisle Road  
Terre Haute, IN 47802  
[mkw@vigoschools.org](mailto:mkw@vigoschools.org)