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ABSTRACT

This report relates how a classroom teacher, building administrator, and a science educator form a partnership to promote change in classroom teaching practices as well as overcome some of the barriers that exist between the conduct of educational research and classroom practice. This paper describes this partnership which serves as one of the components of an on-going inservice model named TRIAD. Some other features of this model which are discussed include: (1) the classroom teacher as researcher; (2) the role of the administrator as active supporter; (3) the activity is conducted on-site, rather than as a campus-based institute or workshop; (5) and the model contains many of the components of an effective inservice as identified in the literature by researchers. Contains 15 references. (ZWH)

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# Teacher, Administrator and Science Educator Form a TRIAD

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**Teacher, Administrator and Science Educator**  
**Form a TRIAD**

Rationale

In spite of decades of research on the teaching and learning process, many teachers teach the same materials and in the same way as a century ago. Major reasons for this stagnation of the educational process include: 1) a large number of teachers are held accountable to follow a prescribed curriculum and/or a textbook without having a great deal of input on the appropriateness of the materials or the sequence in which concepts are taught; 2) many classroom teachers view most of the educational research reports by professional researchers as impractical, superficial and difficult to interpret and apply; and 3) the educational researchers have not allowed the participation of the classroom teacher in the act of research. "Pure" research continues to be communicated only to other researchers with little or no classroom impact.

How may we overcome some of the barriers between the conduct of educational research and classroom practice? First, we need to acknowledge the potentially powerful role of teachers emerged in research. Second, we need to provide practical, effective training for teachers to assume this role.

Blosser (1989) stated, "most conventional educational researchers do not involve the subjects—the teachers—in the research itself. The teacher-subjects have little to say about the purposes, timing, methods, and tests involved." However, it is obvious that the naturalistic setting of the classroom most accurately depicts reality, and the teachers are the only ones who have at their disposal this most ideal setting for conducting research.

Butzow and Gabel (1986) stated, "Teachers who read about research findings are less likely to incorporate the findings in their classroom practices than teachers who do the research themselves." Teachers need to study their own work, in their own way, and decide what changes they need to make in their own classrooms. Before this occurs, as Rudduck and Hopkins (1985) have stated, the teachers must decide that they want to

change rather than having others impose the change upon them. An inscription on the memorial plaque for Lawrence Stenhouse, located on the grounds of the University of East Anglia, bears one of his quotes; "It is the teacher who, in the end, will change the world of the school by understanding it."

### The TRIAD Partnership

This paper describes a TRIAD Inservice Model consisting of the classroom teacher, building administrator, and a science educator, who together create a partnership. The TRIAD Inservice Model: (1) contains many of the components of an effective inservice as identified in the literature by researchers; (2) places the classroom teacher in the role of a researcher; one who constructs meaning about the teaching and learning process, and makes appropriate revisions to create meaningful changes in the learner; (3) involves the administrator in an actively supportive, participating role different than one normally assumed by the majority of administrators; (4) is not a one-shot inservice, but an on-going one in which the teachers are given the skills and the support to implement the ideas discussed and observe their effects on the students; (5) is conducted on-site, rather than as a campus-based institute or workshop.

The role of the teacher as a professional educator in the fullest sense is at the heart of the model. The teacher (1) initiates the concepts or topics to be taught; (2) uses innovative teaching strategies based on a teaching for conceptual change model (See figure 2); (3) collects data from the learning environments; (4) analyzes data, and in light of what is learned from her or his own research; (5) begins to develop a rationale for her/his philosophy of teaching; (6) makes judgements about the appropriateness of curriculum, instruction and assessment; and (7) adjusts classroom practice accordingly.

The teacher, instead of following a prescribed curriculum and allowing the curriculum to evaluate and modify her/his performance and that of the students, becomes the judge of the curriculum and instruction. In this model, the teacher has the opportunity to give

serious thoughts to what to teach, how to teach, and what and how to assess meaningful changes which may be taking place in students.

Rather than being removed from the teaching/learning process, the administrator becomes an active partner. By being involved in the discussions and the activities, the building administrator comes to understand the professional needs of her/his teachers and is more willing to provide the necessary support for them. By participating in the inservice, the administrator receives training in classroom-based research and the application of a conceptual change model of teaching and learning.

To maximize effective change in the classroom and, ultimately the curriculum, the inclusion of the administrator is essential. Walton (1988) stated, "No science education program can succeed without the support of the local school board and administration." Teachers need the leadership and understanding of administrators in order to take risks using non-traditional teaching strategies. In effect, the administrators can provide the support necessary to create needed change.

The science educator provides the expertise with: (1) the interview process; (2) the implementation of teaching strategies for conceptual change; (3) peer coaching; (4) the collection and interpretation of data; and (5) uses of the results to suggest meaningful changes in what to teach, how to teach, and what and how to evaluate.

During the initial meeting, the importance of the teacher as a researcher and the specifics of the partnership are discussed with the administrator and the teachers. During this session the roles of the learners, the teachers, the administrators and the resource persons are made clear.

At each site, the teachers, administrators, and resource persons are involved in a five-session sequence (See figure 1). What follows is a brief description of the TRIAD Inservice Model as it has been used in several sites for the past three years. One cycle of the model may take four to five months. The sessions are scheduled once every four to five weeks, each ranging from two evenings to two full days and evenings. Between

sessions, the teachers work on the agreed upon activities and come prepared to share their experiences during the next session.

The teachers in the project begin by identifying the concept or topic they are planning to cover in the next several weeks. The importance of identifying students' perceptions with respect to the concept is discussed. The teachers prepare written summaries of the concept and what they want to happen to their students as the result of their instruction. They also prepare a set of questions to be used to interview students to find out their pre-instruction views of the concept.

Teachers are instructed on effective interviewing techniques and student learning based on conceptual change. Time is spent on the role of student preconceptions and misconceptions in the learning process. To keep track of any meaningful changes taking place in their students, teachers first have to find out what their students bring to the learning situation. Teacher as a researcher begins with collecting data on students' views of the concept. Emphasis is given to the value of interviewing as an effective way to determine what students know, think and value related to the concept, the value of follow-up questions, and ways to draw from their students' views. In these sessions, methods to interpret data gathered and the information obtained about students' thinking are also covered.

At subsequent sessions, teachers and administrators experience teaching for conceptual change first-hand by getting involved in relevant activities. They also witness the strategy being modeled with their students and make observations (collect data) on the impact of the teaching strategy on their students. Using what they have learned from their students and the modeling of the teaching strategy, the teachers design appropriate units. They then use those units with their students and collect data on the effects of the experience on their students and on themselves.

Throughout the project, teachers share their experiences with their colleagues and their administrators. With the support of their building administrator they also plan and conduct

peer coaching with their colleagues. Teachers also use the teaching strategy and the research aspect of the project in other subject areas. As a result of this novel inservice experience, teachers begin to develop a rationale for what they are teaching, how they are teaching, and what and how they are evaluating what has happened to their students.

### Results

Because it is an extended, applied model, and because of the understanding acquired by administrator participation, teachers are successful at implementing change in their classrooms and schools. Some of the comments from participating teachers and administrators are revealing. In general, the teachers reported that in such a learning environment the students were "highly motivated." "The students liked not having to have the 'right' prediction." After the students got involved they found the activity "non-threatening," especially when they could see that many other students had similar views. "The students generally seemed to take more risks as the lessons progressed." The sharing of their ideas with other students in their group and class also appeared to give the students "a much greater sense of ownership and involvement than in typical exploration exercises." According to some of the teachers, the students who really excelled were not necessarily "book smart." Thus, many students who are turned off by the typical lesson get a chance to really become involved in this type of activity.

The teachers, along with the students, experienced change. One teacher wrote "Perhaps the largest turnaround came in my willingness to take risks along with the students. I have always felt we had to come to a scientific conclusion that had 'pat' reasons why something happened. Now the 'what happens' seems more important than the 'whys'." Another wrote, "I feel like a heavy load has been lifted from my shoulders. Through these experiences, I don't feel I have to have all of the answers to student questions. It is really enjoyable to learn new things along with my students."

Not only did changes in the way they viewed teaching and learning occur, but collegial relations took on a different look. A teacher wrote, "I enjoyed sharing experiences that I

had with other teachers. It seemed you talked about more positive things rather than the normal negative. In my opinion, I saw more teachers get fired up about ideas than I have for quite a while. Anything that brings a spark to education should be kindled and kept burning." Another stated, "I can envision, as a result of this experience, the establishment of team teaching, better communications, a better understanding of what should be taught, and a new challenge afforded teachers [all of] which brings about a rejuvenation to oneself."

One teacher, who had worked on the district science curriculum committee and had earlier met with opposition to her views on curriculum wrote, "My convictions are stronger now because I'm even more convinced that we need understanding versus vocabulary. We need to design curriculum for kids by including the interview (pre and post) on our major concepts." Another wrote, "We need to make sure the curriculum items are relevant to the child's world. Are we really assessing what the child learned from what we taught?" Another teacher wrote, "...teachers usually don't even know what their kids are learning. The learning process is a complex and fragile affair. There is so much that teachers do to interfere with the open and free attitude of children. Unconsciously favoring [and] partiality is a real killer. Not listening acutely enough, [and] failing to truly observe what goes on in the classroom; the years of teacher armor and rigidity need to be stripped away [to allow] a fresher and more vibrant 'student friendly' teaching approach. Talk to and with kids about what they know and also discover what they do not know."

As a result of these sessions, the participating teachers report they have used the process in other areas such as math, reading and social studies. A few of the teachers have submitted a proposal requesting funding for release time and professional development in order to continue these activities and work with teachers in the district and those in the neighboring districts.



Figure 1: The Process

**Session I**  
(2 evenings)

During session:

- Discuss the model and activities
- Discuss teaching for conceptual change
- Teacher identifies concept(s)
- Discuss what needs happen to the learner
- Prepare questions
- Discuss difficulty with teaching/learning concept
- Discuss interview process

Before next session:

- Interview children
- Review how the concept is presented in materials

**Session II**  
(3 evenings and 2 days)

During session:

- Share what has been learned from talking to children
- Compare children's views with textbook presentation
- Experience teaching strategy
- Observe teaching strategy being modeled with children
- Discuss observations
- Design lessons
- Set up peer coaching

Before next session:

- Teach lessons
- Collect data
- Peer coach
- Post interview

**Session III**  
(2 evenings, 1 day)

During session:

- Share observations / experiences
- View teaching strategy with children
- Prepare Lesson II

Before next session:

- Teach Lesson II
- Peer coach
- Collect data

**Session IV**  
**(2 evenings)**

During session:

- Share observations / experiences
- Discuss pros/cons of using model in other areas
- Plan lessons in other area

Before next session

- Teach lesson in other area
- Review curriculum in light of what is learned

**Session V**  
**(2 evenings)**

During session:

- Teams discuss observations / experiences
- Teams discuss merit of the project
- Evaluate project
- Future plans

**Figure 2: Conceptual Change Model**

- 1  

Students become aware of their own perception about a concept.
- 2  

Students expose their beliefs by sharing explanations in small groups and then with the entire class.
- 3  

Students test their ideas by making observations. Working in small groups, they discuss the results of their tests.
- 4  

Students work toward resolving conflicts between their perceptions and their observations through class discussion.
- 5  

Students extend the concepts and try to make connections between what they have learned in class to other situations.
- 6  

Students are encouraged to pursue additional questions and problems of their choice related to the concept.

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