

# TEAMS: Making Effective Use of Interdisciplinary Teams, Active Learning and Instructional Technology in Middle School Classrooms

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In recent years, the publication of Turning Points (Carnegie Council on Adolescent Development, 1989) and of National Standards in several different subject areas (National Research Council, 1996; Wilhelm, 1996; Kendall & Marzano, 1995) has had a major impact on the way in which middle school instruction is planned and presented. In this article we will describe TEAMS (Technology Enhancing Achievement in Middle School), a middle school instructional program that has incorporated a number of the suggestions that have been put forth in these publications.

Three key precepts – employment of interdisciplinary instructional teams, strong emphasis on active learning strategies, and frequent use of technology as an instructional tool - underlie the TEAMS approach. Before we describe the activities that take place in a TEAMS classroom, we will briefly discuss each of these precepts.

## **The Three Precepts Underlying TEAMS**

Interdisciplinary instructional teams consist of two or more teachers who share a common group of students, a particular area of the school building, and a common planning time during which they work together in planning their instructional activities (Erb, 1997; Stevenson & Erb, 1998). Although interdisciplinary teams have existed at the middle school level for more than 30 years, the use of such teams became much more prevalent after the Carnegie Council on Adolescent Development authored Turning Points (1989). One of the major recommendations put forth by the Council was that teachers and students should be organized into teams that work together to help students achieve academic and personal goals.

Studies examining the effects of teaming have indicated that this approach has had a positive effect on teachers' feelings of efficacy and their professional images. Moreover, teaming has had a positive effect on students' self-esteem, their attitudes toward learning, and their performance on standardized tests in mathematics, language arts, and reading (Erb, 1997; Stevenson & Erb, 1998).

Active learning is the second key precept underlying the TEAMS approach. In contrast to the traditional lecture/discussion approach, where students often are expected to be passive recipients of information conveyed to them by the teacher, active learning strategies require students to engage in "hands-on" learning activities.

As indicated in Turning Points, these activities are often designed to help students discover or construct knowledge for themselves and/or allow students to create novel solutions to problems. In other cases, active learning activities provide students with opportunities to practice applying the skills they are in the process of learning. As pointed out in several reports of National Standards, such activities help students to

become active independent learners (National Research Council, 1996; Wilhelm, 1996; Kendall & Marzano, 1995).

Active learning activities often involve having students work cooperatively in small groups. By doing so, students have the opportunity to discuss and evaluate the ideas expressed by their teammates as well as share their insights with, and react to, feedback from their peers (Carnegie Council on Adolescent Development, 1989). These activities help students develop critical thinking skills and reflect upon the opinions of their peers, a group whose influence is particularly strong at this stage in their development. Thus cooperative learning activities help middle school students meet their learning, social, and emotional needs (Wood & Jones, 1994, 1997).

Frequent use of technology as an instructional tool is the third precept underlying the TEAMS approach. In recent years, there have appeared many articles describing the effective use of technology in middle school classrooms (e.g., Blasewitz & Taylor, 1999; Gilstrap, 1997; Windschitl & Irby, 1999). These articles, as well as several of the reports on National Standards (National Research Council, 1996; Wilhelm, 1996; Kendall & Marzano, 1995), describe how the classroom use of technology supports active student learning, especially independent inquiry. There have also been many reports of cases where technology has been used successfully with small groups of learners engaged in active learning as members of cooperative teams (e.g., Cavalier & Klein, 1998; Hooper, Temiyakarn, & Williams, 1993 ).

### **What is the Nature of Instruction in a TEAMS Classroom?**

Now that we have described the three precepts that lie at the heart of the TEAMS approach to instruction, let us describe the nature of instruction in a TEAMS classroom. The TEAMS curriculum is comprised of four nine-week thematic units. In each unit the subject areas of science, mathematics, social studies, and language arts are tied together around one of four themes related to the concerns and needs of middle school students. For example, at the sixth grade level, the four unit themes are Transitions, Caring, Identities, and Conflict Resolution.

During each TEAMS unit, students work through several instructional “rotations”. Each rotation starts with one or two whole group activities, followed by a set of four to six small group activities, followed by a whole group activity designed to bring closure to the rotation. TEAMS materials provide detailed suggestions for each of these activities, but the four teachers (one from each major subject area) who comprise an instructional team are encouraged to use their common planning time to review and revise these activities and plan others that might be better suited to meet the needs of their team of students.

In each subject area, a typical TEAMS rotation extends over a period of approximately two weeks. The first one to three days of the rotation consists of whole group instruction. During this time the teacher and students may be discussing the knowledge or skills that students will focus upon during that rotation and/or the teacher may be providing direct instruction on specific skills the students are expected to learn.

During the next four to six days, the students work in small groups at various learning “stations” in the classroom. During this time, the students are engaged in a wide variety of instructional activities. For example, they may be constructing their own knowledge base in an content that is new to them and/or they may be practicing a specific

set of skills they are expected to acquire. Small groups of students (usually four to six) rotate from station to station on a daily basis until all of the groups have engaged in the activities at all of the stations. After engaging in all of the small group activities, the class meets together as a whole group for one or two days, reviewing and discussing what they learned and/or practiced at the various stations.

Each rotation also includes one or more assessments of student learning. Suggested assessment techniques range from closed book written tests to teacher and/or student assessments of a product or products students produced while working at one or more stations.

There are at least four learning stations set up for each rotation.. There is a Technology Station for computer-based learning, an Exploration Station I for creative activities involving student-generated products, an Exploration Station II for learning in a game-like format, and a Text Station for written work. For example, a language arts rotation designed to help students identify the main ideas in a passage includes the following station activities, each of which is designed to be undertaken by several pairs of students working together on the task:

- a **technology station** where students use a piece of software that puts them in the role of newspaper reporters identifying the main ideas in, and writing headlines for, given newspaper stories;
- an **exploration station** where students create telegrams that summarize key ideas that they must transmit to other students;
- a **second exploration station** where students participate in a game in which they must identify whether given sentence strips describe a main idea or provide supporting details; and
- a **text station** where students read text passages from their science and geography texts and identify the main idea in each passage.

In addition to the four types of stations described above, teachers often add a fifth station of their own choosing. This station may involve the use of another form of technology, such as a videodisc, or a computer connected to the Internet, or the station may involve the use of text-based, or exploration-type activities. By having a fifth station in the classroom, teachers with a large number of students are able to keep each of the small groups in their class down to a fairly modest size.

The activity that students will undertake at a particular station is described, in simple language, on a “task card” located at that station. Although teachers are free to create their own station activities and task cards, the TEAMS model provides teachers with many suggestions for station activities. For example, at the sixth grade level the program materials include over 40 sample task cards in each of the four major subject areas.

Station activities provide students with the opportunity to be self-directed, active learners, either working independently or cooperatively in small groups. Prior to the day students begin their station work, the teacher will typically provide a quick overview of the activities that will take place at each station. The following day, at the beginning of the class period, group members examine a wall chart to determine which station their group will be working at on that day. The group members then proceed to that station, where they read the task card that describes the station activity. The group members then organize the group so that they can work together, or independently, to accomplish the

task described on the card. Sometimes the group will decide upon individual roles and responsibilities. In other cases, designation of roles and responsibilities may be decided upon by a team captain (a title that rotates among group members on a regular basis).

During station work, the teacher shifts to the role of coach and facilitator. While the students work at station activities, the teacher circulates around the room, guiding, probing, checking, and encouraging students as needed. In addition, sometimes the teacher may set up a Teacher Station, where the teacher can work with a small group of students who may need extra attention.

### **Relationship Between the TEAMS Approach and Its Underlying Precepts**

As we mentioned earlier, three key precepts – employment of interdisciplinary instructional teams, strong reliance on active learning strategies, and frequent use of technology as an instructional tool - underlie the TEAMS approach. Now that we have provided an overview of how a TEAMS classroom operates, we would like to focus on how these three elements are part of the TEAMS approach.

The employment of interdisciplinary instructional teams is supported in several ways. Each team of four teachers has a common planning time, shares a common pool of students, and is housed in adjoining classrooms within the school building. Moreover, prior to their first year of implementing the TEAMS approach, each team of teachers attends a summer planning workshop where they learn about the TEAMS approach and begin identifying skills and knowledge that are related across subject areas. In several instances, such workshops have resulted in teachers implementing a simple re-sequencing of required coursework so as to highlight connections across subject areas. For example, the sixth grade science and social studies (geography) teachers at one school decided to coordinate their study of weather and weather mapping, and the mathematics teacher offered to have the students work on the calculations necessary for weather reporting during this same time period.

In addition to identifying logical connections across subject areas, TEAMS teachers are also encouraged to identify how their subject matter relates to the overarching themes of each nine-week unit in the TEAMS curriculum. As mentioned earlier, these themes are based on the personal concerns of middle school children and deal with such areas as conflict resolution and identities. When TEAMS teachers spend some time focusing on these overarching themes, students seem to be better able to identify the relationships across subject areas, as well as identify how that subject area may be relevant to their everyday concerns.

Active learning, the second key precept of the TEAMS approach, is supported by the extensive use of station activities. Unlike traditional classrooms, where most of the instruction involves the teacher leading the entire class in lecture and discussion sessions, under the TEAMS approach a large percentage of the instructional time is devoted to having students working independently or in small groups at the various learning stations described earlier. Teachers and students have reported that this is one of the most positive features of the TEAMS approach and has resulted in students being on task to a greater extent than when they are receiving whole group instruction.

Frequent use of technology as an instructional tool is the third precept underlying the TEAMS approach. Students engage in a computer-based activity at the technology station during every rotation. In addition, as pointed out earlier, other forms of

instructional technology, such as the Jasper Woodbury videodiscs (Cognition and Technology Group at Vanderbilt, 1993), are often employed at a fifth station in a TEAMS classroom.

To help teachers select appropriate software, the TEAMS staff has reviewed software provided by numerous publishers and has identified software programs that support the acquisition of most of the skills taught in the curriculum. In those cases where existing software has not been available, teachers have used the Internet, spreadsheets, word processing programs, and databases to provide students with technology-based practice activities.

We believe that students and teachers are more likely to view technology as an integral part of the instructional process if that technology is based in the classroom, rather than a media lab. Thus we have worked with administrators and teachers to insure that at least four computers are located in each of the TEAMS classrooms. On occasion, this has meant moving some computers out of labs or out of classrooms where they were not being used. In most cases, by having at least four computers in each TEAMS classroom, and by having students work in pairs at the technology station, all the students in a class are able to engage in a technology-based activity during each rotation.

### **How the TEAMS Program Was Developed**

The TEAMS approach was modeled after a successful technology-based elementary school program called Project CHILD (Computers Helping Instruction and Learning Development), which had been developed at Florida State University (Butzin, 1997). Parents of the children in Taylor County, a rural school district in the northern part of Florida were impressed with the effect Project CHILD was having on their children's academic achievement and attitudes toward school and learning. The parents wanted this momentum to continue and constantly asked, "When are you going to have something for middle school?" At about the same time, a group of teachers working at an inner-city middle school in nearby Tallahassee, Florida were putting together some plans for increasing the use of technology in the classrooms at their school. When, in 1991, the Knight Foundation announced its Excellence in Education grant program, researchers at Florida State University decided to apply in order to get the funds necessary to develop the middle school program these parents and teachers wanted.

In 1993, the Knight Foundation provided the funding that led to the development of the TEAMS program. Initially, the project was staffed by an interdisciplinary team of four sixth grade teachers from the aforementioned middle school in Tallahassee, as well as two university researchers, and a former teacher with 18 years of middle school experience (who served as project manager).

During the first half of the 1993, the TEAMS staff of teachers and researchers planned an instructional approach centered around the three precepts described earlier. Using those precepts as guide posts, over the next two years the staff designed an entire sixth grade instructional program in the areas of mathematics, science, social studies, and language arts. The program consisted of a series of detailed suggestions for small group activities and whole group lessons teachers could employ in conjunction with existing text materials, a wide variety of existing software programs and other mediated instructional materials.

In the 1995-96 school year, the TEAMS program was fully implemented at the sixth grade level at the Tallahassee middle school where it had been developed. Since that time the TEAMS model and accompanying TEAMS materials have been revised and expanded upon, to the point where we now have, at the sixth and seventh grade levels, a fully developed set of instructional materials and a training process that enables teachers to implement the TEAMS model effectively. The model has now been implemented at the sixth grade level in four middle schools in Florida, including the middle school in Taylor County, where the TEAMS approach is also being implemented at the seventh and eighth grade levels.

### **Research Examining the Effects of the TEAMS Approach**

Research is currently being conducted to evaluate the effects of the TEAMS approach on academic achievement and other school-related outcomes. Two reports examining the effects of TEAMS have already been prepared. The first (Riggin & Gill, 1997) focused on the effects of TEAMS at one school during the 1995-96 school year; the second (Cooksy & Gill, 1997) focused on the effects of TEAMS at three schools during 1996-97. Results from the 1996-97 evaluation include the following:

- **Student Attitudes:** Most students reported that they had positive attitudes toward school and learning. Their teachers generally concurred.

- **Self-directed Learning Abilities:** Students rated themselves highly on several measures of self-directed learning that TEAMS attempts to foster (e.g., looking for information from sources other than the teacher, establishing individual learning goals, staying on task). Teachers at two of the three schools concurred with the students' opinions, teachers at the third school were less positive.

- **Working in Groups:** Most students indicated that they liked working in small groups, found them useful, and felt they learned while working in them. Their teachers generally concurred.

- **Computer Skills:** Students gave themselves high ratings in computer skills, a set of skills that the TEAMS approach is designed to foster. The students' teachers generally concurred.

- **Learning:** At two of the three schools where the evaluation took place, improvements (from fifth grade to sixth grade) in the standardized test performance of TEAMS students were compared to improvements among students in a matched comparison group. Student scores on the overall test, as well as on the mathematics and language portions, were examined. At the middle school where TEAMS has been in place the longest, TEAMS students improved their scores on the overall achievement test, as well as the mathematics portion, to a significantly greater extent than a matched comparison group from other schools in the same county. However, at a second middle school in its first year of implementation, the improvement in TEAMS students' scores in mathematics and on the overall test were significantly less than that of a group of non-TEAMS students at the same school.

These results are fairly consistent with findings from previous educational reform efforts. In many instances, after educational reforms are properly implemented, improvements in teacher and student attitudes precede improvements in student achievement (Erb & Stevenson, 1999; Stevenson & Erb, 1998). This has been the case with the TEAMS approach – as noted above, in the three schools where our evaluation

efforts have taken place we have noticed improvements in teacher and student attitudes. However, during the first two years of our evaluation efforts, improvements in student performance were only noted at the school where TEAMS had been in place the longest.

## **Conclusion**

In the past ten years, the authors of Turning Points and the various National Standards reports have described a variety of elements that they believe are necessary to support improvements in student learning at the middle school level. The TEAMS project has focused on three of these elements – interdisciplinary teaming, active learning, and instructional technology. These elements have served as the underlying precepts of the TEAMS approach. The TEAMS project is now in its seventh year, and while we certainly have not accomplished nearly all the goals we set out to attain, we believe we have made progress in improving the quality of middle school education in the schools where the TEAMS approach has been implemented. We hope our efforts serve as encouragement to others who wish to use Turning Points and the National Standards as the basis for making changes in middle school instruction.

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