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# Case Studies of Beginning Teachers

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## CASE 11

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# A Teacher Uses Metacognition

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### PREPARING TO USE THE CASE

#### Background Information

In a recent Gallup poll (Elam et. al., 1992), both the teachers and the public rated “developing the ability to think creatively, objectively, and analytically” near the top of a list of goals for education. Being a contributing citizen in today’s society requires nothing less (Rowe, 1990). Today’s citizens also demand well-rounded students, that is, students who have many interests and abilities. As Hoerr (1992) has said, “If we are not careful, we can define intelligence too narrowly and how we define intelligence makes a philosophical statement about what we value in education.” (p. 67)

Another force is pressuring teachers to focus on standardized test scores. Throughout the country, education reform is occurring in every state. The ultimate goal of this movement is simple: school boards are demanding high test scores. Both communities and school administrators want their schools to place in the top half of the national range. Parents want their children to perform well on these tests.

The results of these forces can be an oversimplification of the processes called *learning* and *education*. Like the old TV show *Dragnet*, with Sergeant Friday who just wanted the facts, “Just the facts, ma’am,” when teachers teach mainly for content coverage and high test scores, students, too, get an oversimplified sense of the purpose of education. Stefanich (1990) has said that students view learning only as the mastery of knowledge.

But as Glickman (1991) has said, “The measure of school worth is not how students score on standardized achievement tests but rather the learning they can display in authentic or real settings.” (p. 8)



At the 1991 meeting of the American Educational Research Association, principal Deborah Meier was later quoted (Bracey, 1992) as saying, "We learn best when we are in a position to make sense of things—especially to make sense of things we are interested in. Human beings are by nature meaning-makers, trying to put the puzzle together from the moment of birth until death—this is our preeminent mode. Schools rarely capitalize on it." (p. 265)

### *Topics for Reflection*

1. The effects of metacognition on learning
2. The effects of the emphasis that educational reform programs put on achievement test scores
3. Metacognition strategies that work
4. The effects of student involvement with metacognition on their levels of motivation

## THE CASE

Mapledale Village is a working-class community embedded in one of the seven largest populated urban areas in the country. In the 1930s, Mapledale grew rapidly because of the steel mills. Most residents had blue-collar jobs that required little formal education. According to the 1940 census, the average educational level of the residents of "the Village", as it was commonly called, was seventh grade. Almost everyone who lived in the Village either worked in the mills or operated one of several small businesses that served the mill workers.

During the late 1930s and early 1940s, the community expanded at a steady rate as a flow of newcomers moved in to be close to their jobs. The mill was unionized in the early 1950s, bringing higher wages and attracting laborers from the South who left their nonunion jobs in the textile mills to accept better paying jobs in Mapledale Mills.

Although the mills offered better wages, Mapledale was never a heaven of bliss. Alcohol abuse has always been common among the mill workers. In general, the few social clubs (as bars were called) were unsafe in the daytime and a clear risk to life itself at nighttime.

America's entrance into World War II in late 1941 produced an immediate need for more weapons and ammunition. The open-hearth furnaces of the mills were perfect for making the steel which would be shipped elsewhere to be made into guns, tanks, and ships. The only finished products made locally were the hulls for 105-mm and 155-mm Howitzer shells, and even these were shipped away to be loaded.

The urgent need for increasingly more ammunition and supplies offered unusual opportunities for the mill workers to make good money. Overtime was common, and as the quotas set in all departments were reached and passed, bonuses were given for extra production.

When the war ended, the mill was converted back to traditional peacetime production. The per capita income for the area remained at a comfortable level



until the early 1950s when gas furnaces replaced the open-hearth models. Because of the age of the mill, its owners concluded that the cost of converting to the new furnaces was prohibitive. The smelting department, which consisted of 60 percent of the mills, was closed.

Since the mid-1950s, the community has been on a steady decline. Those who remain have stayed because they own homes in the village. Most workers have retired.

### **The Public Schools in Mapledale Village**

All schools need support, both personal and financial. The Maple County Schools had survived for a quarter century on a shoestring budget. Without strong support from the mills, and with an aging population who would not and could not give strong financial support, this school district had learned to be satisfied with mere survival. New state education reform laws sounded great to those who taught in wealthy districts, but the Maple County Schools could not afford to go beyond daydreaming about reform.

Schools also need the support of parents. Without it, significant academic achievement is unlikely to occur. Terry Bell (1993), who formulated the panel that wrote the first school reform report, *A Nation at Risk*, a decade later said: "Education must become everyone's responsibility, and we must transform the total culture so that it nurtures learning inside and outside the school." (p. 596)

### **The School**

Of the twenty schools in the district, Maple Middle School is the poorest. The school building is an eyesore even to the impoverished community. Having already experienced three decades of steady deterioration, the physical appearance of the school plant quickly worsened last year when the ceiling tiles were removed to rid the building of asbestos. Without the funds required to replace the tiles, the administration had no choice but to leave the ceilings open, giving the building the appearance of a warehouse.

The classrooms at Maple Middle reflect the building's general appearance; most are devoid of supplies beyond the basic necessities. Even the chalkboard trays are filled with chalk dust and only a few short stubs of chalk. Cloths are found on most of the trays, replacing the erasers that have long since worn out and been discarded. Few rooms have overhead projectors or screens, and the few screens scattered throughout the building are torn.

The Parent-Teacher Association has all but disappeared. About the only contact the Maple Middle School teachers have with the parents is when students are arrested for drugs or when severe discipline problems occur.

### **The Teacher**

Brad Wideman is beginning his third year on the Maple Middle School faculty. Having grown up in the Village and attended only Mapledale schools, he has never thought much about these austere conditions. On the contrary, the day he landed



a job at Mapledale was one of his happiest days. Like many students, Brad chose to major in education because of the job itself and also because it afforded him the opportunity to work in his hometown, if he were lucky enough to get a job there. Many of his friends have stayed in the community. His fellow teachers would be the first to say that Brad is well liked by everyone, largely because of his easy-going disposition and his ability to take everything in stride.

But Brad's lackadaisical style disappears when he enters his classroom. His teacher-education program was responsible for this change. If you were to ask him, he would tell you that his college was one of the best in the country. Beyond that, he was just plain lucky to have been assigned to a team of professors and teachers whose main research efforts were in metacognition. The college had a laboratory school where students were assigned extensive pre-student-teaching classroom experiences. A new technology grant has equipped the teacher-education building with two new computer laboratories. Each laboratory is fully equipped with 30 new computers, a laser printer, and a software server.

Three of the required education courses had classroom observation and participation components in the lab school. These classes were: EDF 200: Introduction to Education; EPY 300: Human Growth and Development; and EPY 400: Learning Theory.

Each wing of the laboratory (elementary, middle, and high school) has a new computer lab. All are equipped exactly the same as those in the College of Education. The best part is that all 110 computers in these labs are fully networked so that a piece of software can be shown on all of the computers simultaneously.

Brad had enjoyed his education courses, especially the foundations course, the human growth and development course, and the learning theory course, because each of these courses required participation in the laboratory school classrooms. Some classes required him to develop lessons using software and then implement these lessons. Students were encouraged to plan a variety of metacognitive strategies into mini-lessons, later to be tried out in the laboratory school classroom.

Another distinct advantage of working at this laboratory school was the high caliber of teachers with whom Brad was privileged to work. Furthermore, he had opportunities to work on a variety of projects with different teachers. At first, Brad was reluctant to join a research team which had members from this faculty and professors of teacher education. But his mind changed when he read that the following values accrue from being involved in research and metacognition.

"The research on the effect of studying one's own thinking strategies has been mounting. Many teachers are conducting their own investigations. Several benefits accrue when teachers conduct research studies in their classrooms. Some of the most recognized benefits include:

1. Improves research skills of the teacher.
2. Improves teachers' instructional decision-making skills.
3. Affects their lesson planning.
4. Improves teachers' abilities to evaluate new methods of instruction.
5. Clarifies teachers' theories and beliefs.



6. Promotes collegial interaction.
7. Infuses excitement into teaching.
8. Increases students' interest in learning." (Henson, 1993, pp. 119-120)

In one of his professional association's journals, Brad read an article titled, "Teachers as Researchers" written by Linda R. Cooper (1991). The article listed the following advantages that result from teacher involvement with research:

Teacher-Research programs provide an opportunity for:

- \* reflecting about the teaching experience.
- \* developing formal inquiry from informal inquiry.
- \* doing research rather than merely reading about it.
- \* compiling findings that can be immediately applied to each teacher's classroom.
- \* increasing knowledge and skills.
- \* enhancing teacher self-esteem.

Not bad, Brad concluded. All this just from being involved in a classroom research project.

Brad had found the research itself to be totally nonthreatening, nothing like he feared it would be. Furthermore, he found working with this caliber of teachers exciting, rewarding, and just plain fun.

## The Incident

To say the least, Mapledale was different from the lab school, especially in appearance. Most of the faculty members were content just to complete the day. Yet a few seemed to stay on "the cutting edge" of their disciplines. Several were attending evening classes and were using ideas learned in these graduate classes to design materials and activities for school.

Although these teachers were friendly enough, Brad had been unsuccessful in trying to interest them in metacognition; therefore, he pursued his own research by himself.

During the past two years Brad had experimented with several cognitive approaches, one at a time. One of the most gratifying lessons was an experiment that he had conducted with advance organizers. The experiment had involved three separate lessons, each purposefully different. In one lesson he used a videotape. Prior to showing the tape to one of his classes, Brad identified four concepts that he wanted students to notice. In a second lesson he used as many mnemonics as he could.

In a third class, Brad purposefully made several assignments to assure success for all students so that he could use reinforcements. He was interested in learning what effects a lesson so rich in reinforcements might have on the students.



For each of these lessons, Brad used another class as a control group. Although he did not record the results, from observing each class he concluded that the experimental lessons clearly resulted in more learning.

Brad considered all of these lessons as "trial" lessons. The students did not display the level of enthusiasm for inquiry as had his students at the university laboratory school. Now he was ready to incorporate these strategies into a lesson that would be appropriately recorded and conducted in an acceptable research project.

Brad wanted to improve this lesson further by having the students discover the pertinent concepts for themselves, rather than having them pre-identified. But he wasn't quite sure how he could use advance organizers and also have the students discover the concepts. He also wanted to introduce both an individualistic approach and cooperative learning. This paradox was, to say the least, perplexing, yet the literature he had read supported both individual learning (i.e., accommodating the individual styles of learners) and learning cooperatively.

The lesson Brad chose to incorporate these strategies was a surprise to the students. He began by grouping the students, assigning five students to each group and purposefully grouping the extroverts together to prevent them from dominating their groups. He also grouped the introverts together to force participation among the members of these groups.

The chairs in each group were assembled in a tight circle around an empty desk. On the desk, in the center, Brad placed a small cloth bag with a drawstring. Students in each group were to empty the contents on the table. From each bag came a match, a paper clip, a few sunflower seeds, and a small calendar. Before giving the command to empty the bags, Brad turned on a strobe light and a record player with a record of electronic music.

With their items in front of them, the students were told that they were to use their imaginations and describe what they saw. They would be allotted 30 minutes to write their story. Those who preferred could discuss or "talk out" their perceptions, and those who preferred to write alone without discussing their views could do so.

The second part of the lesson would involve a totally different assignment, the black box puzzle. Students were given a black box containing one moveable object. They were to conduct such investigations as shaking the box, inverting it, smelling it, and even dropping it. They were to listen to the box and weigh it. In summary, they were told to use their senses to solve the mystery of the unknown contents. Each student was permitted to ask three investigative questions.

For this activity, the entire class worked as individuals. The objective was to be the first to correctly identify the contents. Brad wondered whether the competition for this activity or the cooperation in the former activity would be the stronger stimulus.

During the hour, Brad moved about the room carefully monitoring the students. He offered no advice, but he responded to each question that students directed to him.

Some of the students found both of these activities challenging and exciting. Others, who always seemed withdrawn, were content to remain passive. Some



groups got a little loud, but the noise level subsided each time Brad moved near the noisy groups. Brad was more concerned over the withdrawn students than he was over the noise level. He wondered whether the teacher's role is to ask questions or to answer questions.

### The Challenge

Suppose you were in Brad's position. How would you alter this lesson to produce more creativity and learning?

### ISSUES FOR FURTHER REFLECTION

1. How might the Mapledale Village community affect students' reactions to an open lesson such as this? How might Brad prepare these students to be more receptive?
2. Were there any advance organizers in this lesson? What role should/can they play in an inquiry type of lesson?
3. What evidence do you find that Brad is aware of the differences among students' preferred learning styles, and how might he adjust this lesson to further accommodate their styles?
4. Do you believe Brad's grouping the reserved students with other reserved students was a wise choice? Why or why not?
5. Do you believe that allowing the students to choose whether they wished to perform the first assignment with others or individually was a good decision? Can you cite literature or research to support your answer?
6. Suppose you were teaching this lesson and the principal, who pressed hard to raise student achievement test scores, asked you to refrain from "wasting" time on this type of lesson. How might you convince this principal of the value of such a lesson?
7. Consider Mr. Bell's statement about "a nurturing community," and explain how you think Brad might garner the support of the Mapledale parents.
8. Explain what you believe caused the major differences in the level of support given by the laboratory school parents and the Mapledale parents.
9. How could Brad apply his college experience with technology to stimulate creativity and problem solving in his classes at Maple Middle School?
10. How could Brad use his experience with mnemonics in these lessons?
11. In such an austere environment, if you were given \$100 to buy any equipment you chose to buy, how would you spend that money?
12. Brad is well received by his fellow teachers. How might he convince them to help him get the community's support for this school?
13. Individuals can improve their ability to think logically if they understand how they currently think. At the conclusion of this lesson, how might Brad best help students analyze their approaches to solving the black box problem?
14. How might Brad use reinforcement in these lessons?
15. In addition to using reinforcement, how might Brad help these students improve their self-concepts?
16. The writing activity had no stated goals. What are some justifiable objectives of such an activity?



17. Brad was careful to avoid interfering in these lessons. How involved and how unobtrusive should a teacher be during such assignments?
18. Brad monitored the class. Is this good or bad? Why?

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