

## Snapshot #11

### Critical Thinking Across the Curriculum Aloha High School

Kathleen Cotton

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#### RESEARCH FINDINGS

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In order for students to develop skill in critical thinking, several elements of classroom and schoolwide climate and practice need to be present. According to *Effective Schooling Practices: A Research Synthesis* (Northwest Regional Educational Laboratory 1984), these include:

At the classroom level:

1.2 There are high expectations for student learning.

- Teachers set high standards for learning and let students know they are all expected to meet them. Standards are set so they are both challenging and attainable.

1.3 Students are carefully oriented to lessons.

- Teachers help students get ready to learn. They explain lesson objectives in simple, everyday language and refer to them throughout lessons to maintain focus.
- Objectives may be posted or handed out to help students keep a sense of direction. Teachers check to see that objectives are understood.
- The relationship of a current lesson to previous study is described. Students are reminded of key concepts or skills previously covered.
- Students are challenged to learn, particularly at the start of difficult lessons. Students know in advance what's expected and are ready to learn.

At the school level:

2.8 There are high expectations for quality instruction.

- All staff believe that students can learn regardless of their ability level and enthusiastically accept the challenge to teach them. When staff get together they often discuss instructional issues.
- Staff development opportunities are provided; emphasis is on skill building; content addresses key instructional issues and priorities. Inservice activities are related to and build on each other; incentives encourage participation.

2.11 Teachers and administrators continually strive to improve instructional effectiveness.

- Throughout the school there is an ongoing concern for improving instructional effectiveness. No one is complacent about student achievement; there is an expectation that educational programs will be changed so that they work better.
- School improvements are directed at clearly-defined student achievement and/or social behavior problems; strong agreement is developed within the school concerning the purpose of improvement efforts.
- Priority goals for improvement are set which give focus to planning and implementation. Goals which specify desired changes in achievement or social behavior are known and supported in the school community.

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## SITUATION

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Located in a predominantly suburban area southwest of Portland, Oregon, Aloha High School is one of three high schools in the Beaverton School District and serves 1,530 students in grades ten, eleven, and twelve.

The Beaverton district is large; over 22,000 students attend school in 35 buildings. In this "bedroom community," nearly all students are white/non-Hispanic, and income levels are moderate to upper middle class. There is a wide variety of businesses and industrial complexes in the Beaverton area, including such hightech companies as Intel and Tektronix.

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## CONTEXT

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Aloha High School is a participant in the Onward to Excellence school improvement process -- a process in which school leadership teams compile profiles of school performance, and school staff select improvement goals based on the information in the profiles. Staff then develop research-based prescriptions and plans to achieve the goals selected, implement plans, and continue to monitor improvement activities as work toward the goals proceeds.

When reviewing their school profile two years ago, Aloha staff determined that students were not exhibiting a desirable level of skill in critical thinking. Following a review process, they designated the improvement of student achievement through the development of critical thinking skills as their schoolwide goal. Staff also came to several other agreements, including:

- A working definition of critical thinking as the reasoning, reflection and creativity that produces a decision, action, or belief
- A decision to focus on the explicit thinking skill model, with emphasis on the clusters of attributing, sequencing, analysis, and inference
- A conviction, based on a review of research, that certain teaching strategies elicit critical thinking on the part of students; thus, the implementation plan places emphasis on teaching strategies rather than instruction in explicit skills
- A decision to focus initially on four strategies -- New American Lecture, wait-time, Writing to Learn, and questioning.

The approach chosen by Aloha staff to improve students' critical thinking skills involves staff training and follow-up activities in the instructional strategies identified above. It is also important to Aloha staff that the school's critical thinking program be integrated into the curriculum rather than being an "add-on" component, and that it be integrated into all courses -- not only those usually thought of as "academic." Thus, the staff development approach chosen needed to be compatible with these goals.

Aloha's school improvement leadership team began by engaging the services of Richard Strong of the consulting firm of Hansen, Silver, and Strong. Strong is the developer of an instructional approach called the New American Lecture (NAL), major features of which include:

- Using "advance organizers" -- blank charts, grids, flowcharts, and the like, which can be used by teachers and students to record information from a lecture or a text
- Actively involving students -- gaining participation of all students during the interactive portions of lessons, e.g., getting them to share ideas with a partner, respond to a directive, etc.
- Asking questions or assigning brief activities -- conducting these activities every five to seven minutes and including questions from the four quadrants in the NAL questioning/thinking styles matrix: mastery, understanding, synthesis and involvement

Briefly, mastery questions are those calling for knowledge of content; understanding questions call for interpretation, comparison/contrast, or summarizing; synthesis questions ask the student to draw upon content knowledge in considering a hypothetical situation; and involvement questions place the student in a particular circumstance and call upon his/her knowledge to explain a preference, defend a position, and so on. It can readily be seen that these kinds of questions call for different degrees of higher cognitive or critical thinking.

Staff have also received instruction in increasing wait-time. Research shows that when teachers are willing to wait several seconds for a student to respond after asking a question, improvements in the quantity and quality of student responses result.\* Making teachers aware of the beneficial effects of increased wait-time and ongoingly encouraging increases in wait-time, are important components of Aloha's staff development program.

Writing to Learn is another basic element. Teachers are trained to engage students in brief writing exercises during classes in order to firm up their understanding of the concepts or skills just presented.

Aloha uses a training of trainers model in its staff development program. Consultants work intensively with the school's department heads and peer coaching participants on one or two instructional strategies at a time. These participants then work with other staff to implement strategies in classrooms. Thirty-two of Aloha's 87 certified staff members have now received in-depth training in critical thinking instructional strategies.

One of Aloha's goals is to build teacher self-esteem through an approach to staff development which empowers teachers by enabling them to meet the learning style needs of different students. This, too, is in keeping with the goals envisioned by the school improvement committee, and the peer coaching component of the program is a major element in building self-esteem through increasing competence.

Peer coaching participants, along with school improvement committee members and department heads, receive in-depth training in instructional strategies related to critical thinking. They also receive training in the specifics of coaching one another. Peer coaches work in pairs, trios, quartets or even larger groups, visiting one another's classes, learning from what they observe, and giving one another suggestions for improvement. They may make as few as four visits per year or as many as eight or nine.

Asked about the value of peer coaching to their success in implementing critical thinking instructional strategies, participants say that it increases communication, reinforces learning provided in inservice sessions, and increases the likelihood that knowledge and skills will be shared. They also note that participation in peer coaching has brought about an increase in lunchtime and other out-of-class discussions about how to improve instructional strategies.

School improvement committee members recognized from the start that ongoing evaluation would be an important aspect of Aloha's critical thinking skills program. Accordingly, Aloha staff developed an evaluation plan and has now conducted two annual evaluations. Highlights from the 1987-88 evaluation report include:

- Review and initial administration of the locally developed Assessment of Critical Thinking Skills Test indicate that this test will be useful for assessing growth in critical thinking skills in the future.
- Student interview results reveal a high degree of recognition on the part of students of key features of critical thinking teaching strategies implemented in their classes.
- Classroom observations indicate that many teachers were engaging in obvious, easily recognizable examples of critical thinking instructional strategies, i.e., New American Lecture, Writing to Learn, and increased wait-time.
- A staff survey revealed a high incidence of usage of the strategies, as did an English department assessment of their frequency of usage.

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## **PRACTICE: CRITICAL THINKING**

### **INSTRUCTIONAL STRATEGIES**

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#### **LANGUAGE SKILLS**

A visit to a tenth grade Language Skills class allowed observation of methods used to teach the difference between dependent and independent clauses. The teacher and students were engaged in a question-and-answer session, with questions sometimes addressed to the whole class and sometimes to individuals by name. Different kinds of clauses were displayed on overhead transparencies and students were asked to analyze these, breaking them down into component parts.

The teacher was very animated in his manner, bringing life to the often static subject of grammar. He allowed plenty of wait-time, gave brief praise for correct responses and, when responses were incorrect, called on another student, saying, for example, "Jane, help Stephen out." Throughout the lesson the teacher continued to repeat major points while providing guided practice.

#### **FOODS**

A class of tenth graders were given a New American Lecture on the different kinds of pies (custard, fruit, meat, etc.), after which they were asked to complete an organizer chart on the making of pie crust. The experience of the teacher (who also teaches Personal Finance) is that the use of organizers as a structure for note-taking increases the likelihood that students will actually read assigned material and take notes.

Asked about the usefulness of organizers, students in the class made the following comments: "It's easier to remember." "It comes back to you later." "They get you organized. You're not just scrambling around in your notes to remember where the next point is." "They put things in order."

#### **CHEMISTRY**

Students in a chemistry class were asked to read one of the chapters from their text in class, because it contains particularly difficult concepts. A sheet of "focus questions" was passed out to guide students' study of the material. The questions asked students to answer "true" or "false" to each of a series of statements and then to write out their reasons for answering as they did.

While students were reading the chapter, the teacher moved about the room, checking their work and offering help as needed.

#### **ENGLISH LITERATURE**

The teacher and students in this class were engaged in a discussion of a Shakespearean sonnet.

The teacher allowed generous amounts of wait-time to encourage student responses, and this approach seemed to elicit more thoughtful answers than would be likely in a fastpaced question-and-answer session.

The teacher sought to convey the meaning of images from the poem in a variety of ways -- gesturing, drawing on the blackboard, calling for students to make connections ("True love is to us as what is to the sailor?"). The teacher reminded students about the need to defend their interpretations by offering evidence from the poem to substantiate their views. While obviously finding the poem puzzling, students appeared very willing to speculate about its meaning and keep working at understanding it.

## **ALGEBRA II**

Major elements of the New American Lecture format were apparent in the instruction delivered in this class. Verbal and written steps needed to solve a series of problems were provided. During guided practice, the teacher continued to remind students of the principles involved in solving this type of problem. Overhead transparencies were used to work through problems with students, calling for answers from them and inviting them to note which previously worked problems were similar. In discussing his approach, the teacher said that he characteristically works through several problems by way of demonstration, comparing and contrasting the types of problems, and focusing on the mechanics of problem solving while demonstrating steps toward solution.

Those desiring more information about Aloha's program may contact Sue Tarrant-Berg, Principal, Aloha High School, PO Box 200, Beaverton, OR 97075, (503) 591- 8000.

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