

## Snapshot #35

# Applying Total Quality Management Principles To Secondary Education

**Mt. Edgecumbe High School  
Sitka, Alaska**

**Kathleen Cotton**

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*Quality is never an accident. It is always the result of intelligent effort. It is the will to produce a superior thing.*

-- John Ruskin

*It requires a quality experience to create an independent learner.*

--Myron Tribus

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## Research Findings

As they work to establish a norm of continuous improvement, staff and students of Mt. Edgecumbe High School in Sitka, Alaska exhibit many characteristics congruent with the research on effective schooling. As drawn from the Northwest Regional Educational Laboratory's *Effective Schooling Practices: A Research Synthesis/1990 Update*, findings which are particularly relevant include the following.

At the *classroom* level:

### **1.1.1 Instruction is Guided by a Preplanned Curriculum**

d. Resources and teaching activities are reviewed for content and appropriateness and are modified according to experience to increase their effectiveness in helping students learn.

### **1.3.1 Students are Carefully Oriented to Lessons**

b. Objectives may be posted or handed out to help students keep a sense of direction. Teachers check to see that objectives are understood.

### **1.3.2 Instruction is Clear and Focused**

b. Teachers are sensitive to the learning style differences among students, and, when feasible, they try to identify and use learning strategies and materials which are appropriate to differing styles.

e. Students are taught strategies for learning and for remembering and applying what they have learned....

### **1.4.3 Personal Interactions Between Teachers and Students are Positive**

c. Teachers communicate interest and caring to students both verbally and through such nonverbal means as giving undivided attention, maintaining eye contact, smiling, and positive head nodding.

d. Students are allowed and encouraged to develop a sense of responsibility and self-reliance. Older students, in particular, are given opportunities to take responsibility for school-related matters and to participate in making decisions about important school issues.

e. Teachers foster positive teacher-student and student-student relationships through the use of cooperative learning strategies.

At the *school* level:

### **2.1.1 Everyone Emphasizes the Importance of Learning**

b. The principal and other administrators continually express expectations for improvement of the instructional program.

### **2.3.2 Administrators and Teachers Continually Strive to Improve Instructional Effectiveness**

a. No one is complacent about student achievement; there is an expectation that educational programs will be changed so that they work better.

### **2.3.3 Staff Engage in Ongoing Professional Development and Collegial Learning Activities**

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## **Situation**

Sitka, Alaska is located in the southeastern part of the state on Baranof Island and is home to approximately 8,500 people. Tourism, timber, and fishing are Sitka's major industries. Originally populated primarily by Tlingit Indians, the area in and around Sitka has also experienced a long-term Russian presence, and the area's art, architecture, cuisine and other

cultural features reflect these two lines of ethnic influence.

Named after an imposing, nearby volcanic mountain, Mt. Edgecumbe High School is in many ways an atypical secondary institution. It is a residential school attended by approximately 300 young people from all over the state. About 80 percent of Mt. Edgecumbe's students represent at least 14 Native American and other ethnic minority groups. A quarter of the school's population comes from families with poverty-level incomes, and over 40 percent of them--most frequently those from families in the fishing business--qualify for migrant education services. Formerly a Bureau of Indian Affairs boarding school, Mt. Edgecumbe High School has been operated by the State of Alaska since 1985.

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## **Context**

### **TRANSITION TO A STATE-OPERATED SCHOOL**

With the early 1980s legislation requiring that high school education services be made available in all Native villages, Mt. Edgecumbe High School's 36 years as a BIA-operated boarding school came to an end. The federal closure of the school lasted for only a few months, however, because significant numbers of Alaska Natives who had once attended the school began to call for it to be reopened. Accordingly, the state board of education voted to reopen Mt. Edgecumbe and, after necessary building renovation, it began operating as a state school in 1985, with an 88 percent Native student population.

Concern about preparing Native youth for tomorrow's education and employment opportunities led to key curriculum decisions by state board and school staff members. These included: (1) a focus on technology applications; (2) emphasis on real-life entrepreneurship skills; and (3) designation of English, computers, mathematics, social studies, science, physical education, and Pacific Region studies as the school's core subjects.

### **"TOTAL QUALITY MANAGEMENT": LEARNING ABOUT SYSTEMIC IMPROVEMENT**

Teachers attend conferences all the time; but seldom has this kind of event had such far-reaching impact as the participation of Mt. Edgecumbe's former technology/business teacher at a Total Quality Management (TQM) conference in Arizona in the summer of 1987.

This teacher learned about the "fourteen points" for quality in business operations as put forth by W. Edwards Deming, widely regarded as the "father" of the TQM movement. He also became familiar with the "three Cs"--a focus on customers, culture, and capacity for continuous improvement--which are the signature features of total quality environments and which many successful businesses have used to rejuvenate themselves. As described in the National Alliance of Business publication, *The Cutting Edge of Common Sense: Total Quality, Education, and Systemic Change* (1993):

**The Customer**....total quality really has two kinds of customers in mind--the external customers, who "consume" the product or service offered, and the internal customer, i.e., those who, in the process of creating a product or service, receive the output of another's work, with each successive person adding something of value....if everyone does his or her job in a way that eliminates problems for the

next person up the line, the final customer...will be satisfied....

**The Culture.** A successful change strategy involving quality management also involves a commitment to create a specific kind of organizational culture, based on trust and shared decision making....

**The Capacity.** Leaders in quality-oriented companies seek ways not merely to change but to manage and instill the change process itself: in Deming's terms, they achieve "constancy of purpose" ....

**MOST IMPORTANT: IN ANY ORGANIZATION, TOTAL QUALITY IS ABOUT SYSTEMIC CHANGE**

The "lead actor" in TQM is...the process of systemic change itself...The point is to develop the organization as an integrated, organic set of relationships, and to gain the ability to change and direct those relationships again and again in the direction of improvement--as defined by the organization's internal and external customers.

These and other TQM concepts, together with their potential application in educational environments, were introduced upon the business/technology teacher's return to Mt. Edgecumbe High School. He began to utilize TQM principles in his computer class. Within a year, students from the computer class prepared and gave presentations--both at Mt. Edgecumbe and elsewhere--on the beneficial effects of TQM principles on their school experiences and personal lives. Interest in the TQM approach spread among Mt. Edgecumbe staff and students, and in a few months, the business/technology teacher, then-Superintendent Larrae Rochelean, and Academic Principal Wilhelm Denkinger attended TQM workshops presented by W. Edwards Deming.

Shortly after receiving training, they presented to the entire academic staff a proposal to implement the TQM approach schoolwide. Favorably impressed with what they had seen of TQM thus far, 100 percent of the academic staff agreed to proceed with implementation.

## **TQM Components in the High School**

Mt. Edgecumbe's implementation of TQM principles has proceeded from an adapted version of Deming's fourteen points for quality in organizations. Called "Mt. Edgecumbe High School's Modified Deming Points for Quality in Education," these goals have been reviewed and updated as the school's program has evolved. Because they guide all of Mt. Edgecumbe's operations, the "points" are reproduced here in their entirety, and I have used boldface type for key ideas within points.

1. **Create and maintain a constancy of purpose toward improvement** of students and service. Aim to create the best quality students capable of improving all forms of processes and entering meaningful positions in society.
2. **Embrace the new philosophy.** Educational management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
3. **Work to abolish grading and the harmful effects of rating people.** Focus on the learning process, not the rating process.
4. **Cease dependence on testing** to achieve quality. Eliminate the need for inspections on a mass basis (standardized achievement tests) by providing learning experiences which create quality performance; learning experiences that encourage creativity and

- experimentation.
5. **Work with the educational institutions from which students come.** Minimize total cost of education by improving the relationship with student sources and helping to improve the quality of students coming into your system.
  6. **Improve constantly and forever the system of student improvement and service** to improve quality and productivity in personal life and community.
  7. **Institute continuous training on the job** for students, teachers, classified staff and administrators; for all people connected to the human organization or community.
  8. **Institute leadership.** The aim of supervision (leadership) should be to help people use technology and materials to do a better job and set the pace driving human creativity.
  9. **Drive out fear**, so that everyone may work effectively for the school system. Create an environment which encourages people to speak freely and take risks.
  10. **Break down barriers between departments. People** in teaching, special education, accounting, food service, administration, curriculum development and research **must work as a team.** Develop strategies for increasing the cooperation among groups and individual people. Planning time will facilitate this dynamic.
  11. **Eliminate slogans, exhortations, and targets for teachers and students asking for perfect performance and new levels of productivity.** Exhortations create adversarial relationships. The bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the control of teachers and students.
  12. **Eliminate work standards (quotas) on teachers and students** (e.g., raise test scores by 10%; lower dropouts by 15%). Substitute leadership, the eternal drive for quality, and joy of learning.
  13. **Remove barriers that rob the students, teachers and management** (principals, superintendents and central office support staff) **of their right to pride and joy of workmanship.** This means abolition of the annual or merit rating and of management by objectives. The responsibility of all educational managers must be changed from quantity to quality.
  14. **Institute a vigorous program of education and self-improvement for everyone.**
  15. **Put everybody in the community to work to accomplish the transformation.** The transformation is everybody's job.

In the nearly seven years since Mt. Edgecumbe began implementation of the TQM approach, its program has become more eclectic, incorporating elements from the work of other analysts and futurists--Myron Tribus, Joel Barker, Peter Senge, Stephen Covey, John Marsh, and others--who have focused on individual and organizational self-renewal. The continuous adaptation and use of the work of these thinkers by the staff and students at Mt. Edgecumbe has been instrumental in fueling their TQM journey.

## **PROGRAM ELEMENTS**

Both students and teachers participate in bimonthly TQM training activities, which keeps them focused on this approach to educational improvement and ways to achieve TQM goals. This training is crucial for new students entering the system. Over the four semesters that the training activities take place, the notion of continuous improvement as an operational norm becomes internalized, and both staff and students gain skills and tools for establishing and maintaining quality classroom environments. Among the contents of these sessions are:

- The elements of a TQM approach to teaching and learning
- Key terms and operational definitions

- Developing a vision and improvement priorities
- Identifying and accessing sources of help--human and material
- Team roles in the learning environment
- Designing individual and team projects
- Group and individual decision making
- Staying focused on improvement.

Probably the most basic feature of Mt. Edgecumbe's program is the high degree of responsibility students take for managing and assessing their own learning. In keeping with the TQM philosophy, the teacher serves in a facilitator/coach/counselor capacity, assisting students to conceive projects--projects being the chief means by which students develop and demonstrate competency. Teachers help students to determine what competencies are needed, how they will be assessed, and how to work through and evaluate agreed-upon project components.

Student projects typically call for knowledge and skill from across the curriculum. A project calling for design of a spawning channel for salmon, for example, might require knowledge and skill in marine science, geography, writing, and oral communication skills, together with generic skills in research, analysis, problem solving, and defending one's ideas.

Over time, teachers and students have worked together to develop "competency matrices" for learning outcomes within each core subject area. Along the vertical axis of each matrix are listed the competencies organized by competency categories and by learning outcome. For example, within the subject area of "Alaska Issues," students must demonstrate achievement in several learning outcome areas, including "Native Issues." As part of achieving mastery in "Native Issues," they must exhibit competence within several categories, such as "Tribal Government" and "Current Issues." Within each of these categories are listed the competencies which comprise it. For example, the category "Tribal Government" includes several competencies, including "Indian Reorganization Act-history," "Sovereignty-issues," "Tribal organizations," and "Role of Tribal governments."

Along the horizontal axis of each matrix are listed the six levels of Benjamin Bloom's classic Taxonomy of Educational Objectives, which proceed, in increasing order of sophistication, from knowledge to comprehension, application, analysis, synthesis, and evaluation/appreciation. The primary target for all areas is application. Students receive continual training in the meaning and use of these designations. Thus, they develop facility in assessing their own learning by identifying the degree to which they grasp each competency and assigning the appropriate designation.

For example, with support from a teacher, a student might determine, at a given point in time, that her learning about tribal organizations has the following characteristics: understanding of information, ability to recognize the information in other forms, capacity to explain it to others, and to make use of it. She can give a personal or original example of how she uses this information. At this time, she has not yet learned to utilize the information in more sophisticated ways. Thus, she determines that, vis a vis this competency, her learning has proceeded through knowledge to comprehension, and that higher levels of learning this competency await her.

Class periods at Mt. Edgecumbe are 90 minutes long on most days; consequently students do not have every class every day. Staff and students agree that these generous class periods allow in-depth involvement in learning activities and greater opportunities to make progress on class and individual projects. On alternate Wednesdays (when students are not in their bimonthly

TQM trainings), they have extra in-school time to work on the projects they have negotiated with their teachers.

Over time, Mt. Edgecumbe has made good on its intention to move away from the use of standardized achievement tests, giving much more prominence to assessment methods such as alumni and parent surveys and portfolios as means to assess student learning and determine program success.

Academic and interpersonal support of Mt. Edgecumbe's students is provided through the organization of staff and students into "extended families." Each staff member, including noncertified staff, participates in an "extended family" made up of his or her own nuclear family and a small group of students. These extended family groups increase students' sense of belonging by giving them personal attention and involving them in out-of-school activities such as fishing, cards and games, picking berries, and occasional meals in the staff members' homes. A highlight of this observer's time at Mt. Edgecumbe was participation in one of the school's weekly "Family Nights," where extended family groups eat together in the school cafeteria, socializing and planning other "family" activities.

## **SELECTED ACTIVITIES**

Mt. Edgecumbe High School has received considerable attention nationally and even internationally, both for its implementation of the TQM philosophy and for specific successful projects that have been carried out using this approach. So numerous are the travels to and from Mt. Edgecumbe to teach and learn about the school's quality management approach that not all of them will be itemized here. Suffice it to note that, beginning in 1988, Mt. Edgecumbe administrators, teachers and students have given presentations on their quality management approach to educators and business people throughout Alaska and many of the lower-48 states, as well as traveling to Canada, England, China, Japan, and Greece. The school has received visitors from all over the U.S. as well as from European countries, Australia, and New Zealand. A few specific highlights include:

### **1988:89**

- The principal, the entrepreneurship teacher, and his students develop salmon products and travel to Japan and China to study Pacific Rim markets, promote products, and establish a school/business partnership.

### **1990:**

- Myron Tribus, nationally recognized TQM expert, visits and writes about Mt. Edgecumbe High School for a national publication.
- Staff and students make presentations in Massachusetts, Wisconsin, California, Kansas, Texas, New Mexico, and Ontario.

### **1991:**

- IBM/CCM makes the film, "Quality or Else" at Mt. Edgecumbe High School.
- Two students attend and present at a Deming conference in London, England.
- Alaska Commissioner of Education asks Mt. Edgecumbe staff and students to

train 125 Alaska State DOE employees in quality processes and techniques.

- Futurist/quality consultant Joel Barker visits Mt. Edgecumbe High School, studies the curriculum, and donates a two-day workshop for faculty members.

### **1992:**

- Arthur Anderson & Co. send a team to study Mt. Edgecumbe High School as part of their "Schools of the Future Program," and a staff and student group train an Anderson "Future" school in Chicago.
- Alaska Governor Hickel declares Mt. Edgecumbe High School an "America 2000" school.

### **1993:**

- A staff and student group travels to rural Alaska schools to mentor quality methods.
- Harvard University sponsors annual International Principals Conference in Sitka featuring Mt. Edgecumbe High School.

In addition to these kinds of honors and accomplishments, Mt. Edgecumbe also has to its credit many other notable achievements in its own community, for example:

- Receiving a state telecommunications grant for equipment, travel, and administration needed to make videos aimed at prevention/reduction of drug and alcohol use, teenage pregnancy, AIDS, etc.
- Designing a bicycle path system which was described in the publication, Alaska Issues
- Producing for the governor's office a video on Alaska's Community Development Quota which was aired on public television
- Using quality principles and business/technology learning to help their families' small businesses (e.g., tourism and fishing) to improve their operations and become more successful
- Participating in the PBS learning course, "Strategies for Change" video series
- Participating in the Juran Institute's "The Quality Management Report" video series
- Making the school newspaper virtually self-supporting by selling advertising space to local businesses.

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## **PRACTICE: QUALITY IN ACTION IN MT. EDGEKUMBE'S CLASSES**

Two days of observation and interviewing at Mt. Edgecumbe provided an informative and delightful look at quality in action. A briefing with Quality Coordinator Todd Bergman included viewing the Mt. Edgecumbe segment of a videotape titled "Native American Education: Strategies for Change." General information about the school is accompanied in this segment by many scenes of hands-on learning, whether it involves carrying out business operations in a classroom setting or wearing wet suits into a river "to experience a good spawning environment from the salmon's point of view." While cautioning viewers that "TQM



is not a quick fix," the video voiceover concludes that Mt. Edgecumbe students and staff find that "creating independent, life-long learners is worth the effort."

## **MARINE SCIENCE**

As Marty Johnson's marine science class of juniors and seniors prepared to climb aboard the bus for a field trip to the Sheldon Jackson College Fish Hatchery, Mr. Johnson oriented them to what they could expect to see and learn. "We'll follow the fish [different kinds of salmon] through their life cycle," he said, going on to reinforce the connection of this and other field trips to the students' first project--design of a natural spawning channel for salmon. Differences among the life cycles of king, coho, pink, sockeye, and chum salmon were noted, in order that the spawning channels designed by the students will be suitable for the kind of fish selected. This first project of the year is provided by Mr. Johnson to show how a project is conceived and carried out; subsequent projects will call for greater student responsibility.

The field trip route--from the bus to the fish ladders, to the tanks where the fish are stripped of sperm and eggs, to incubators, and on to tanks where the fish spend the early part of their lives--was an in-motion discussion, with Mr. Johnson speaking (shouting, actually, since the hatchery is a noisy place) and students taking notes, making drawings, and asking questions. Mr. Johnson periodically invoked terms and concepts familiar to students from their TQM trainings in order to provide ideas or strategies about how they might organize their learning and remember key ideas. Mt. Edgecumbe's marine science program is an expression of several of the school's goals: It is based upon the importance of the salmon fishing industry throughout Alaska, the fact that many students are from fishing families, and the school's focus on learning about Pacific Rim nations and their markets.

## **VIDEO PRODUCTION**

Michelle Winger's second-year video production class provides both high school credit and University of Alaska-Southeast credit for participating students, who come from both Mt. Edgecumbe and nearby Sitka High School.

The day of the observation, students were engaged in two important discussions: determining how to spend the \$50,000 telecommunications grant the program recently received from the state (referred to earlier, for making public service videos), and planning a new project--a half-hour, reading-oriented television program for small children called "The Reading Rock."

These technologically sophisticated young people and their teacher, as they held a creative session for the new program, provided a telling exhibition of the application of TQM principles to project development. They put forth ideas; gave arguments in support of their views; challenged one another and their teacher firmly but courteously; identified necessary equipment, production roles, and time requirements, and so on. For each potential new equipment acquisition, they identified its advantages and disadvantages in relation to other possibilities.

Throughout this process, Ms. Winger occasionally raised considerations that the students had not thought of or contributed ideas for the program, but she did not take control of the process or veto any ideas. She contributed to the discussions as a knowledgeable and experienced participant. In 90 minutes, the students reached consensus for the directions of both of their projects. Perhaps equally important, their discussions were punctuated with jokes, laughter, and

good-natured teasing; they were clearly having fun.

## **JOURNALISM**

An order of business in Kathleen McCrossin's journalism class, at this early point in the school year, is for students to establish their vision for the school newspaper, the Channel Light. Or, more accurately, two visions--one for the newspaper as a product, and another for the process whereby the product is developed.

Ms. McCrossin spoke of her approach to teaching the class. "The school paper is their paper," she said, "and in working on it, they learn technology, business practices, teamwork, research skills, and the connection between school and the real world." Ms. McCrossin indicated that she feels fortunate to have six returning journalism students from the previous year, who can take on leadership roles, serving as editors while the new students are learning the roles needed to publish a newspaper.

Last year, noted Ms. McCrossin, her class earned \$2,500 over and above expenses that the current class can use to begin this year's work. Beyond that, they will develop advertising contracts with businesses--a new idea this year--and engage in other projects to bring in revenue.

It was enlightening to watch and listen to this group of young people as they engaged in one of TQM's key processes--vision building. "What is a vision?" asked Ms. McCrossin, with students responding that a vision is "a goal," "the big picture," "idealistic," "a dream," "the best possible product or procedure." She then led a "visioning" activity, inviting students to brainstorm "characteristics of an ideal newspaper." She reminded them that "anything goes" during the brainstorming process, since the list will be refined later.

The second-year journalism students were initially more active than the new students in citing desirable attributes for the paper, but soon the newer students were contributing just as many ideas. In this way, students suggested that their ideal school newspaper should:

- Be big and thick
- Have quality stories
- Be accurate
- Be informative
- Deliver a message
- Apply principles of good design
- Be thought provoking
- Get people involved
- Reflect the characteristics and interests of the student body
- Produce excitement
- Produce satisfaction
- Be a model for others
- Be well known, famous
- Be influential
- Address all readers (not just students)
- Be positive and proactive
- Be fair and nonbiased
- Inspire
- Educate

As this activity proceeded, Ms. McCrossin observed and encouraged students, probing and asking questions at points where the brainstorming began to slow down.

Next, one of the student editors very capably led an activity aimed at brainstorming components of a vision for the process of creating the school newspaper. This was followed by a division of the class into two groups, each one further dividing itself into the quality management roles of recorder, contributor, leader, and encourager. With each group focusing on one of the two parts of the vision, they worked with the brainstormed lists, clustering like things, eliminating repetitions, rank ordering items and, finally, drafting a vision statement. They then shared these drafts with one another, trading comments and editing suggestions, and agreed to finalize the statement during their next class period.

Ms. McCrossin did not find it necessary to be directive with students at any point in the process; rather, she functioned as an encourager and occasional critic, helping students to stay focused on key ideas and come up with appropriate wording.

## **EVALUATING MT. EDGECUMBE'S PROGRAM: THE VIEWS OF STUDENTS AND PARENTS**

Staff and student self-assessments of student projects/products show a trend toward broader understanding and more sophisticated expression of learning material. More prosaic measures, such as SRA exam results, reveal a modest but steady increase in student achievement over the nearly seven years of application of TQM principles in the school's educational program. Other positive indicators are the low dropout rate, high attendance rate, more than twice as many enrollment applications as openings, and the fact that nearly all recent graduates went on to college (68 percent) or technical/trade school or military service (18 percent).

Perhaps most telling, however, are the ratings the school has received from its primary "customers"--its students. Findings from an externally conducted 1993 graduate survey are highlighted below:

- Seventy-three percent indicated that Mt. Edgecumbe high school did a good or very good job preparing them to continue their education.  
Ninety-seven percent stated that the quality of education they received was better than what they would have received in their home communities.
- Seventy-three percent would like to have their own children attend Mt. Edgecumbe.
- Ratings of the quality of courses taken ranged from 4.1 (mathematics) to 4.7 (computer science) on a 5-point scale.

## **UPCOMING: HOSTING A NATIONAL CONFERENCE**

During this writer's visit, many staff and students spoke of the upcoming "Edgecumbe '95," a national conference on quality in education and learning, which will take place in April 1995. Quality management experts, futurists, business people, educators and others will participate in workshops conducted by (some) staff and (predominantly) students. TQM concepts, descriptions of successful projects, guidelines for those wishing to set up their own quality management programs, and other topics will be addressed. Development of workshop content and promotional materials for this large-scale event was well underway at the time of the observer's visit.

Mt. Edgecumbe High School has been overwhelmed in recent years by calls and visitation requests, and schedules have consequently been established to accommodate this high level of interest. Current visitation and conference information is available by calling the school at 907/966-2201 or FAXing a request to 907/966-2442. For an "Educator's Sample Packet" of materials describing Mt. Edgecumbe's program, send a \$15.00 check or money order payable to "Edgecumbe Quality Team" and addressed to Edgecumbe Quality Team, Mt. Edgecumbe High School, 1330 Seward Avenue, Sitka, Alaska 99835.

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